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A study of accession and implementation of the 2004 BWM Convention in Vietnam: challenges and sollutions.

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WORLD MARITIME UNIVERSITY

Malmö, Sweden

A STUDY OF ACCESSION AND IMPLEMENTATION OF THE 2004 BWM CONVENTION IN VIETNAM – CHALLENGES AND SOLLUTIONS

By

LA QUY THANH

Vietnam

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DECLARATION

I certify that all the material in this dissertation that is not my own work has been identified, and that no material is included for which a degree has previously been conferred on me.

The contents of this dissertation reflect my own personal views, and are not necessarily endorsed by the University.

(Signature): .....

(Date): .....20 September 2021.....

Supervised by: **Capt./Dr. Raphael Baumler**
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ABSTRACT

Title of Dissertation: **A Study of Accession and Implementation of The 2004 BWM Convention in Vietnam – Challenges and Sollutions**

Degree: **Master of Science**

Although the accession and implementation of the BWM Convention is a key to deal with the problem of invasion of harmful aquatic species through ship's ballast water and sediment, Vietnam currently faces many challenges in these processes. This study aims to emphasize the importance of accession to the Convention, determine what are the challenges for the main stakeholders and how to tackle those difficulties.

The study is based on a review and analysis of Vietnam's legal system, and data collected from the reports of relevant ministries, Vietnam Maritime Administration, shipowners association, and other articles and studies posted on the official websites in Vietnam.

Through the research, many challenges have been pointed out such as the gaps in legal and regulatory document, the limited investment, the lack of human and technical resources, the mismatch in the quality structure of the Vietnamese fleet, and the financial crisis of shipping enterprises.

This study suggested the government has not presently focused its attention on developing a National Ballast Water Management Strategy and strengthening the legal system. Secondly, the training of human resources and the dissemination of legal documents seems insufficient. Thirdly, shipping enterprises should adapt to BWM Convention challenges.

Finally, based on the assessment of the situation, this study proposes a roadmap for the next steps of accession to the Convention under the current conditions of Vietnam.

KEYWORDS: BWM Convention, Ballast Water and Sediment, Invasive Alien Species, IAS, Accession, Implementation, Challenges, Vietnam.

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LIST OF ABBREVIATION

ASEAN	Association of Southeast Asian Nations
BW	Ballast Water
BWE	Ballast Water Exchange
BWM	Ballast Water Mangement
BWMC	Ballast Water Management Convention
BWMP	Ballast Water Management Plan
BWMS	Ballast Water Management System
BWRB	Ballast Water Record Book
BWTS	Ballast Water Treatment System
CBD	Convention on Biological Diversity
CESTI	Center for Science and Technology Information and Statistics of Vietnam
DWT	Deadweight tonnage
GDP	Gross domestic product
GISIS	Global Integrated Shipping Information System
HAOP	Harmful Aquatic Organisms and Pathogens
IAS	Invasive Alien Species
IBWMC	International Ballast Water Management Certificate
IMO	International Maritime Organization
IOPP	International Oil Pollution Prevention Certificate
MARPOL	The International Convention for the Prevention of Pollution from Ships

MEPC	Marine Environment Protection Committee
MEPSEAS	Marine Environment Protection of the South-East Asian Seas
MONRE	Ministry of Natural Resources and Environment
MOT	Ministry of Transport
NBWMS	National Ballast Water Management Strategy
NIS	Non-Indigenous Species
PBBS	Port Biological Baseline Survey
PSC	Port State Control
PSCO	Port State Control Officers
TCR	Total Capacity Rate
TOR	Term of Reference
UN	United Nation
UNCLOS	United Nations Convention on the Law of the Sea
UNCTAD	United Nations Conference on Trade and Development
UNEP	United Nations Environment Programme
USD	United States dollar
VINAMARINE	Vietnam Maritime Administration
VR	Vietnam Registry
WMU	World Maritime University

CHAPTER I: INTRODUCTION

I.1 Background and problem statement

Shipping is generally known as a backbone of world trade with over 80% of global trade by volume (UNCTAD, 2018). The development of international shipping has created extremely favorable conditions for the rapid growth of economy, trade, import and export of countries around the world, especially developing countries with strong potentials in the maritime field, including Vietnam. However, shipping has also been widely recognized as one of the major invasion vectors of invasive species (United Nations, 2021, p. 345). The spread of invasive alien species (IAS) is dangerous becasue 7,000 species are moved around the world in ship's ballast water everyday, and 10 billion tonnes of ballast water are transferred each year globally (Tamelander et al., 2010). In addition, Millennium Ecosystem Assessment (2005) noted that the impact of IAS has been recognized as one of the leading causes of biodiversity loss and changes in the maritime ecosystem functioning as well as provisioning and supporting services.

Shipping economy is one of Vietnam's strengths and is considered an essential lever in the integration process. The benefits of shipping are reflected in many socio-economic activities, especially import and export. Besides, Vietnam is recognized as one of twelve centres for biodiversity in the world with a variety of ecosystems, species, and endemic genetic resources (Vietnamabs, 2020). The biodiversity of marine ecosystems is the foundation for the sustainable development of many marine economic sectors based on natural resources such as tourism, fisheries, and marine medicine. Therefore, the conservation of marine biodiversity from IAS through ship's ballast water is one of the important issues that the country needs to pay attention to and take appropriate defense measures in the future.

On September 8, 2017, the International Convention for the Control and Management of Ships' Ballast Water and Sediments (BWM Convention) officially came into effect (IMO, n.d.-a) and as of the end of June 2021, there are 86 contracting states (with a total fleet of ships accumulating 91% of the total world fleet tonnage) party to the BWM Convention (GISIS). The BWM Convention provides for Member States' responsibilities and obligations to manage shipowners concerning the control and equipment of the ballast water management system. Futhermore, it provides specific indexes of ballast water standards that the ship is allowed to discharge into the sea (the number and size of marine organisms, phytoplankton, bacteria) to protect and ensure ecological and economic safety for biological species, marine animals and not affect or cause damage to our environment, human health, property or other resources or those of other countries.

Vietnam has more than 40 seaports, including vital ports such as Saigon, Cai Mep - Thi Vai, Vung Tau, Da Nang, Hai Phong and Quang Ninh. There are always a large number of foreign ships calling in and out with the huge demand for ballast water exchange and sediment discharge from the ships. In the long term, if Vietnam does not have sufficient management measures, the sources of harmful bacteria or aquatic organisms presenting in the ballast water or sediment can pollute the marine environment, affect the marine ecosystems and also harm human health, affect agricultural production, forestry, fisheries as well as the socio-economy of the whole country.

Therefore, accession to the Convention and effective enforcement and implementation of its provisions will help Vietnam in minimizing, and eliminating the risks of the IAS to the marine environment, human health, and offers many benefits for the conservation of biodiversity and the sustainable development of the shipping industry. Nevertheless, the regulations of the BWM Convention currently pose many challenges for Vietnam in many aspects.

This study will point out the challenges brought by the BWM Convention to some of the main stakeholders consisting of the government, maritime authorities, shipping businesses and seafarers, and propose recommendations to help them to overcome those difficulties. Futher, this study will give a practical roadmap for the next steps of accession to the Convention under the current situation of Vietnam.

I.2 Aim and Objectives of the Research

Firstly, this study aims to express and discuss the need of accession to the Convention by Vietnam. Secondly, the study will point out and discuss main potential difficulties and obstacles in the process of accession and implementation of the BWM Convention of the government, maritime authorities, shipowners, shipping companies and seafarers. Thirdly, recommendations will be given to handle those challenges. Finally, this study will propose a reasonable roadmap for accession to the Convention in the future.

This research will focus on following objectives:

- The first objective is to study the need for Vietnam to accede to the Convention.
- The second objective is to assess the current situation and analyze the challenges for the government, maritime authorities, shipowners, shipping companies, and seafarers.
- The third objective is to come up with recommendations to overcome all the difficulties in acceding to and implementing the Convention.

I.3 Research questions

- Why does Vietnam need to accede to the BWM Convention? What are the benefits of the Convention to the country?
- What are the Vietnamese legal documents related to the implementation of the BWM Convention?

- What are the challenges in acceding and implementing the BWM Convention for the government, maritime authorities, shipping enterprises and seafarers in Vietnam? What are the possible solutions to handle those challenges?
- What is the appropriate roadmap for the next steps of Vietnam's accession to the BWM Convention?

I.4 Expected Results

Although Vietnam has many strengths in the maritime industry, there are numerous obstacles needed to handle to integrate with the world. One of those difficulties is the accession and effective implementation of international maritime conventions, including the BWM Convention.

This research will focus on finding and analyzing problems of the government, maritime authorities, shipping enterprises, and seafarers to find out useful and practical solutions to implement the BWM Convention.

After assessing the situation, the current work intends to recommend a suitable and practical roadmap of accession to the Convention.

I.5 Methodology of the Research

To achieve the objectives of this research, the author will use the qualitative research methodology for this study. This study will be divided into four main stages, as follows:

- In the first stage, to assess the need to accede to the Convention, the necessary information will be collected. The information regarding the current situation of Vietnam’s shipping fleets will be synthesized from documents of maritime authorities and shipowners in the conferences of the Ministry of Transport (MOT) and Vietnam Maritime Administration (VINAMARINE). Information regarding the impact of IAS, including in the ship’s ballast water, will be

gathered from reports from the Ministry of Natural Resources and Environment (MONRE), research institutes, and other relevant sources. Finally, the Vietnamese legal system related to the implementation of the BWM Convention is evaluated.

- In the second stage, gaps and difficulties of the government, maritime authorities, shipowners, shipping companies, and seafarers in implementing the regulations of the BWM Convention will be identified and analyzed. The author will collect the relevant data from the reports of national authorities, shipowners' associations, and other relevant stakeholders.
- In the third stage, by comparing reports and expert advice, the study intends to comprehensively understand problems and identify lessons learned from the other Member States of the Convention to come up with recommendations.
- Finally, it is expected that Vietnam will follow the roadmap proposed by IMO (see Figure 1).

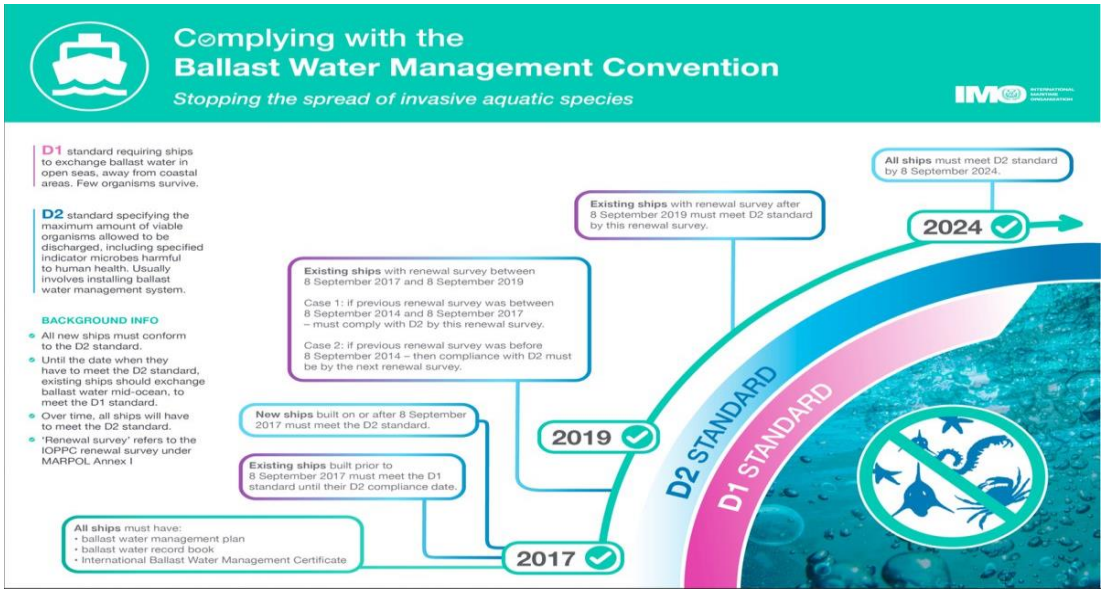

Figure 1: The roadmap to compliance with the BWM Convention

Source: IMO

CHAPTER II: LITERATURE REVIEW

II.1 Introduction

Ballast water is essential to stabilize ships at sea. When the ship is moving without cargo or only partially loaded, ballast water will be pumped into the ship to maintain efficient operation of the propeller and rudder, especially in rough sea conditions. Conversely, when the ship is intended to load more cargo, ballast water will be pumped out to make room for the cargo to be loaded (see Figure 2). These are basic principles to explain the importance of ballast water for ships' safe and efficient operation.

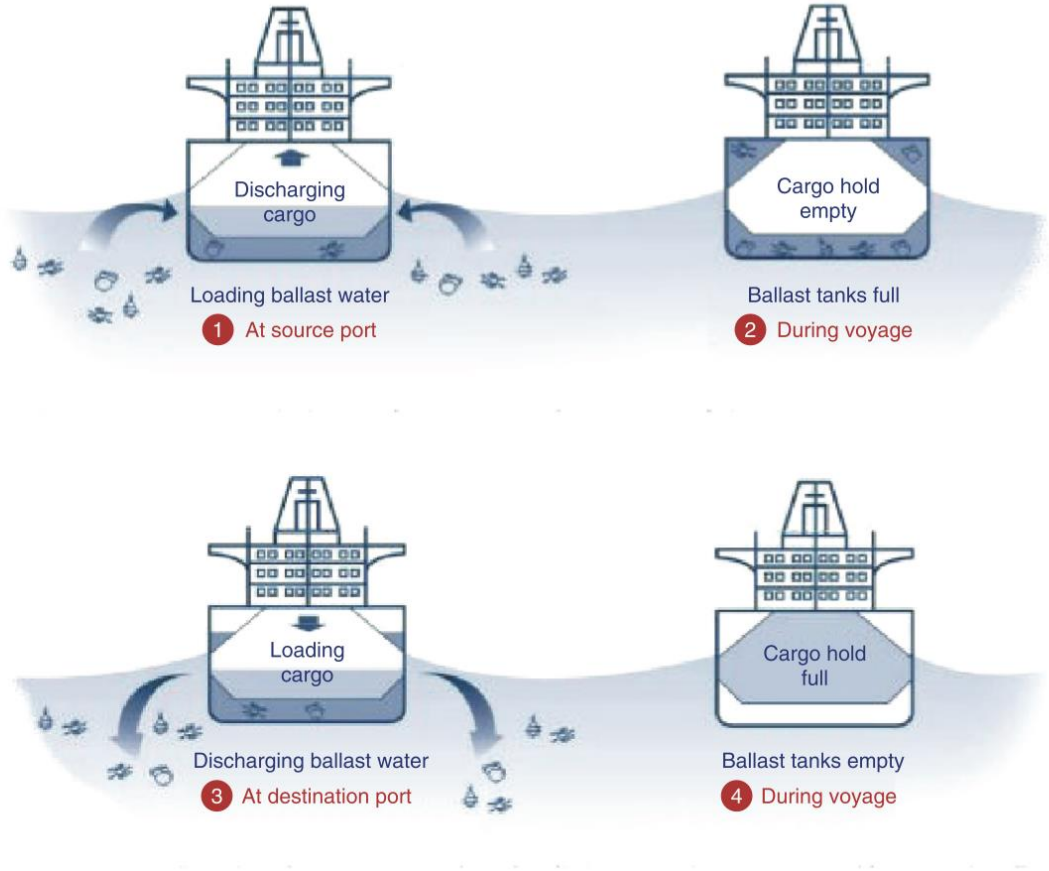

Figure 2: Ballast water exchange operation of ships

Source: GloBallast, IMO

The use of ballast water for commercial vessels for the above purposes has been broadly practised since the late 1870s (Bailey, 2015). The nature of international transport results in a significant transfer of ballast water between different continents and oceans, thereby releasing native organisms from the ballast water into the new environment, where, under favourable conditions, they can become invasive species (Carlton, 1985). The IAS through ballast water can have catastrophic impacts on the environment, changes to ecosystem function, impacts on human health and well-being, economic and cultural issues; and remedying these consequences is very complicated (Tamelander et al., 2010, p. 3). Consequently, the introduction of IAS through ballast water has been recognised as one of the four greatest threats to the world's oceans (Werschkun et al., 2014).

Recognizing the significant influence of this issue, the United Nations (UN) has set out an international framework in Article 196 of the UN Convention on the Law of the Sea (UNCLOS). The Article requires all Member States to collaborate to prevent, reduce and control pollution of the marine environment, including the intentional or accidental introduction of species (alien or new) to a particular part of the marine environment, which may cause significant and harmful changes to it. In addition, since the 1990s, the IMO – a specialized agency of the UN has developed guidelines for controlling and managing ships' ballast water and preparing for a binding international convention at the same time. Finally, the BWM Convention was put into practice at a diplomatic conference in 2004 (IMO, 2004). Although the adoption of the Convention will set the critical stage for responding and mitigating the risk of IAS through ballast water, acceding to the Convention and effectively implementing and enforcing its provisions and regulations has posed many challenges for countries worldwide, especially for developing countries with limited capacity. Therefore, it was not until September 2017 that the Convention had enough members and the world's merchant shipping gross tonnage to come into force officially.

II.2 Support from international organizations

To foster international and public-private cooperation and assist developing countries in ballast water management, the IMO has worked together under the GloBallast Partnerships Project stretching over the period from 2000 to 2017 in two phases (2000-2004 and 2007-2017) (IMO, n.d.-b). Many GloBallast Publications have been researched and issued to maximize support for countries in ballast water management and effective implementation of the BWM Convention. Some of the critical documents are as follows:

- Guidelines for National Ballast Water Status Assessments (GloBallast Monograph Series No. 17) in 2009. The Guidelines support countries in carrying out an appropriate rapid status assessment to evaluate ballast water issues in the country, identify specific gaps and challenges and improve legal and institutional, including ratification of the BWM Convention. They also assist in the development of national policies and law and strategies for ballast water management.
- Guidelines for Development of a National Ballast Water Management Strategy (GloBallast Monograph Series No. 18) in 2010. This document provides detailed guidelines for the Member States to develop the national ballast water management strategies in five steps: political decision; gathering information and developing national policy, strategy and action plan; drafting, enacting, and implementing legislation and effect institutional reform; implementing strategy and action plan; and monitoring and evaluating the system.
- Guidelines for Economic Assessment of Ballast Water Management (GloBallast Monograph Series No.19), in 2010; and A Synthesis of the National Assessments conducted by the Lead Partnering Countries of the GEF-UNDP-IMO GloBallast Partnerships Programme (GloBallast Monograph No. 24), in 2017. The documents assist maritime administrators, or other leading agencies in evaluating the potential economic consequences of unintended marine species introductions. Such economic understanding is intended to

support sound decision making concerning IAS risk reduction, preparedness and response planning, and a source of information for developing a National Ballast Water Management Strategy.

- Technical review on establishing equivalency in the performance testing and compliance monitoring of emerging alternative Ballast Water Management (GloBallast Monograph Series No. 20), in 2011. The document stimulates discussion on how proposed alternative methods to BWM need to be evaluated, tested and monitored concerning the existing requirements of the Convention and its technical Guidelines; and equivalency in their performance testing and compliance monitoring concerning the BWE D-1 (short-term process) and BWT D-2 standards (long-term process).
- Guidelines for identifying and Managing Risks from Organisms Carried in Ships' Ballast Water (GloBallast Monograph Series No. 21), in 2013. The purpose of this document is to provide guidance on the identification and mitigation of risks presented by ships' ballast water and sediments. Some of the critical aspects in the document are risk management (including risk assessment and mitigation methods as well as their application) and the roles and practices of the Flag, Port and Coastal State in ballast water management issue.
- Guidance on Port Biological Baseline Surveys (GloBallast Monograph Series No.22), in 2014. The document provides guidelines on developing Port Biological Baseline Surveys (PBBS), through which it provides inventories of marine life in and around commercial ports frequented by ships carrying ballast water. The information from the PBBS will assist port authorities and lead agencies on the current distribution of non-indigenous species (NIS) and cryptogenic species within the port and surrounding areas, including those that may have been introduced by shipping. In addition, the PBBS can provide important information for the effective implementation of a national BWM strategy and measures applicable to the port and visiting ships.

- Guidance on Best Management Practices for Sediment Reception Facilities under the Ballast Water Management Convention (GloBallast Monograph Series No.23), in 2017. The document provides essential concepts, existing experiences and lessons learned regarding for production and operation of sediment reception facilities in Member Countries regulated in Article 5 of the BWM Convention. Futher, the guidelines support the development of national management strategies for sediment reception facilities.

Most recently, IMO joined forces with the Norwegian Agency for Development Cooperation and established a project called Marine Environment Protection of the South-East Asian Seas (MEPSEAS), which is phase II of the IMO-Norad collaboration to assist seven developing countries in South-East Asia (Vietnam, Cambodia, Malaysia, Indonesia, Myanmar, the Philippines, Thailand) in addressing high-priority marine environment issues related to ships and shipping in particular, implementing four of IMO's fundamental international environmental conventions, including the BWM Convention (MEPSEAS, n.d.). This project has been successful in the first phase (2013-2017) and is continuing to implement the second phase from January 2018 to December 2021. Specifically, the project has organized seminars with the participation of experts to help countries in the following matters:

- Building the National Task Force
- Drafting the National Legislation
- Drafting National Strategy
- Ratification of the Conventions
- Drafting the National Action Plan
- National training on implementation
- Drafting detailed regulations
- Drafting PSC procedures and training for PSCO

In Vietnam, as of October 6, 2020, the project has supported much of the content, including promoting accession to the Convention and drafting detailed regulations. Only one content item has not been implemented, which is preparing the Port State Control Inspection Procedures and training for the PSCO (see Figure 3).

Figure 3: Progress Chart of the MEPSEAS Project in South-East Asian Countries (Green: Done; Orange: In progress; White: Not Started)

Source: MEPSEAS

II.3 Challenges for some developing countries

Although the IMO have issued many guidelines for the effective implementation of the BWM Convention, the accession, implementation and enforcement of the Convention depend heavily on the capacity of each country. In particular, developing countries with limited capacity face many difficulties in joining and implementing the BWM Convention. There has been much research pointing to specific obstacles, including:

- Challenges for the government, port authority and maritime administration regarding lack of specific legislation to prevent biological invasion, legal liability system, public participation system, management system (departmental functions due to different management purposes, lack of good communication between departments, lack of unique coordination mechanism to manage and control ballast water, lack of risk management system, including risk assessment, monitoring and early warning and emergency management) (Shuyan Ji, 2019). Futher, there are difficulties in identifying the lead agency for the process of ocean governance, absence of congressional ocean management policy, coordination and collaborative work in a comprehensive manner between stakeholders, scientific know-how and the appropriate laboratory facilities, lack of human resources (experienced, technology and trained personnel), insufficient budgetary and resources (Thalatha, 2016). Furthermore, technical challenges concerning a national mechanism for capacity building, effective methods for BW sampling, approval and certification of sufficient BWMS, and financial challenge for maritime administration related to training, dry-docking, development of national facilities for disposal and reception of BW and sediments (Javier, 2018).
- Challenges for shipowners regarding selection, installation and operation of BWMS, additional fuel consumption and ships space to retrofit BWMS (especially for old ships); a hazard to seafareres health and safety due to

systems using active chemicals, market consideration (the higher demand, the higher price) (Li, 2017).

- Challenges for seafarers in terms of additional workload, harmful and toxic operating procedures of the BWMS (Phanuwat, 2018).
- Challenges for Coastal States in terms of environmental monitoring, detection and investigation of violation to the BWM Convention; challenges for Flag States regarding lack of training on some specific BWMS due to frequent crew changes; and challenges for Port States regarding PSC procedures and adequate training for PSCO (Küçük, 2019).

However, different countries with different circumstances, conditions and capacities will have different difficulties and solutions in accelerating the accession and effective implementation of the BWM Convention. Vietnam is also a developing country, and there are many obstacles in joining and implementing the BWM Convention. In addition, Vietnam holds all three roles of Flag State, Port State and Coastal State simultaneously; this creates even more difficulties and challenges in this regard.

Currently, there are two studies related to the accession and implementation of the BWM Convention in Vietnam. The first is a study by Nguyen Manh Tung from Vietnam National University in 2018 with the topic of "Study of The International Convention for the Control and Management of Ships' Ballast Water and Sediments 2004". This study has outlined the current legal provisions related to implementing the BWM Convention in Vietnam; however, it has not shown the relevance and compliance with the BWM Convention's provisions and other international conventions, including UNCLOS and MARPOL. In addition, the directive documents of the MOT related to the process of joining and implementing the provisions of the BWM Convention have not been presented. Although this study pointed out some difficulties if Vietnam joins the Convention, it is not exhaustive and detailed for each stakeholder.

Another study by Le Viet Long from World Maritime University in 2020 with the topic of "Accession to the Convention for the Control and Management of Ships' Ballast Water and Sediments 2004" focuses on the Vietnamese legal system related to the implementation of the BWM Convention, as well as pointing out the gaps between existing regulations and the Convention. At the same time, it also pointed out two obstacles in implementing the BWM Convention in Vietnam about technical issues such as BW sampling, exposure to toxic substances, human resources, and economic issues. However, there are still many other aspects that have not been fully synthesized and analyzed. This study has also made some recommendations regarding the amendment of several legal documents to be more consistent with the implementation of the Convention and provides a roadmap for accession to the Convention for Vietnam expected at the end of 2021. However, due to the impact of the Covid-19 pandemic and the difficulties in overcoming existing gaps leading to this roadmap may not be appropriate anymore.

II.4 Conclusion

Based on the shortcomings from two studies on accession and implementation of the BWM Convention in Vietnam, this study aims to complete the missing contents, and at the same time focus on identifying challenges, difficulties, obstacles of main stakeholders, including the government, maritime authorities, shipping enterprises and seafarers. From the lessons learned and solutions of other researchers as presented in Section II.3, the study will identify specific and appropriate solutions to the situation of Vietnam in order to overcome those problems. In addition, this study also considers the current situation and condition and updates the results that have been and have not been done so far by Vietnam in the process of preparing for joining and implementing the BWM Convention to develop a more suitable roadmap for the accession. This study will provide a deeper insight into the resolution of obstacles in the implementation of the Convention, build confidence among stakeholders, and shorten the time of Vietnam joining the BWM Convention.

CHAPTER III: OVERVIEW OF THE INTERNATIONAL CONVENTION FOR THE CONTROL AND MANAGEMENT OF SHIPS' BALLAST WATER AND SEDIMENTS

III.1 History of the BWM Convention

In 1903, the first scientists in the world recognized a number of non-indigenous marine species suspected of spreading through ballast water after the appearance of phytoplankton in the North Sea of Asia, which is Odontella algae (scientific name is Biddulphia Sinensis) (Ostenfeld, 1908; Nehring, 1998; Gollasch, 2000). It was not until the 1970s that the scientific community conducted research, looking at it in detail. In the late 1980s, Canada and Australia were the countries with invasive species problems in their waters, and they expressed their concerns to the International Maritime Organization (IMO) and the Maritime Environment Protection Committee (MEPC) (Prasad et al., 2014).

The problem of IAS in ballast water is primarily due to expanding seaborne trade and maritime shipping over the past few decades. Quantitative data show that the rate of ongoing invasion is increasing rapidly, and new areas are being invaded more and more (Folkunger, 2010).

Since 1988, IMO has been at the front of addressing the problem of IAS transferred through international shipping. From 1991 to 1997, IMO adopted three documents consisting of Resolution MEPC.50(31), Resolution A.774(18) and Resolution A.868(20) to guide and support Member States in addressing this issue.

After more than 14 years of complex negotiations among the IMO Member States, the BWM Convention was adopted by IMO at Diplomatic Conference in 2004. After the ratification of Finland on 8 September 2016 (bringing to a total of 52 Member Countries, accounting for 35.14% of the world merchant shipping tonnage), the BWM Convention officially entered into force on 8 September 2017, marking a turning point

in preventing the spread of IAS that can destroy the native ecosystem, affect biodiversity, and cause significant economic damage. Under the Convention, all new-built ships must meet the D-2 Standard; existing ships must meet the D-1 or D-2 Standards. However, the D-1 Standard has not been deemed an excellent method for ballast water management. As a result, the MEPC 72 session adopted a new phase schedule mandatory for ships to meet the D-2 standard with a deadline of 8 September 2024 (see Figure 4).

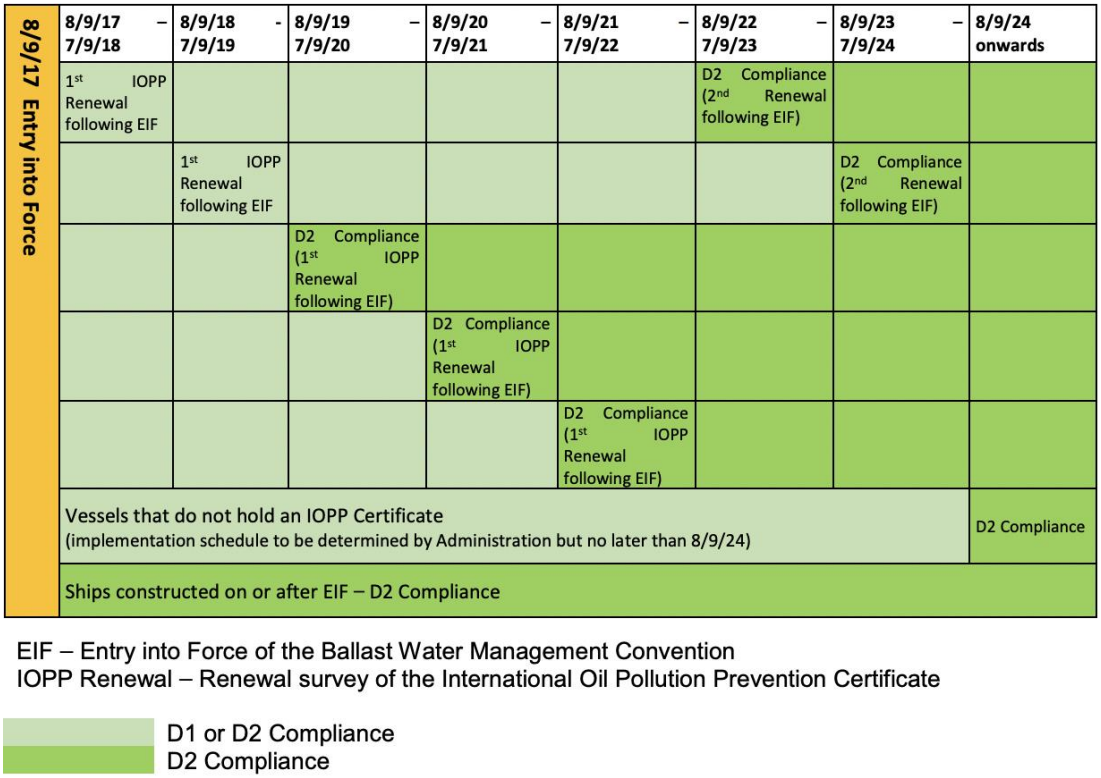

Figure 4: BWM Convention D2 Implementation Schedule Table

Source: Maritimecyprus

III.2 Application and core elements of the Convention

The objective of the Convention is to "prevent, minimize and ultimately eliminate the risks to the environment, human health, property and resources arising from the transfer of harmful aquatic organisms and pathogens through the control and management of ships' ballast water and sediments, as well as to avoid unwanted side-

effects from that control and to encourage developments in related knowledge and technology" (International Maritime Organization, 2009, p. 2).

At the core of the Convention, there is the obligation to manage ballast water before discharging it.

- Firstly, the Convention requires the ships to treat the ballast water in ways that become less harmful. In Section D, the Convention provides two ways of doing that consisting of Ballast Water Exchange Standard (regulation D-1) and Ballast Water Performance Standard (Regulation D-2, aiming to control the number of micro-organisms that can be discharged). The ships are also required to remove and dispose of sediments in compliance with Regulation B-5 of the Convention.
- Secondly, to ensure compliance with the Convention regarding the ballast water management, the ships must have on board and implement a Ballast Water Management Plan (BWMP) and Ballast Water Record Book (BWRB) as specified in Regulation B-1 and B-2 of Section B, respectively.
- Thirdly, the ship will be surveyed and certified by flag authorities to ensure full compliance with the provisions of the Convention as specified in Article 7 and in accordance with Regulation E-1 and E-2 in Section E of the Convention.
- Finally, procedures for approval of Ballast Water Management Systems on board ships are specified in Regulation D-3 of the Convention and taking into account Guidelines developed by the Organization (the BWMS Code and Guidelines G9 for systems that make use of active substances).

III.3 Rights and obligations of Vietnam under the BWM Convention

When Vietnam is a Member State of the BWM Convention, as Flag State, Coastal State and Port State, Vietnam has the following rights and obligations:

III.3.1 Rights

- Inspecting ships flying the Vietnamese flag under the provisions of the BWM Convention; issuing the International Ballast Water Management Certificate (IBWMC) for Vietnamese ships operating on international routes and foreign ships that need certification in Vietnam after they have satisfactorily completed the inspection as prescribed.
- Carrying out PSC inspection of foreign ships arriving at Vietnamese ports to ensure that those ships comply with the provisions of the BWM Convention; if detecting that a ship has deficiencies that threaten natural resources, the environment, and human health, the ship shall be detained or expelled; prohibiting the ship from discharging ballast water if a ballast water sample taken from the ship is found to have a negative impact on the environment, human health, property or resources.
- Investigating, detecting, and handling violations against ships flying the Vietnamese flag and relevant organizations and individuals, including foreign ships operating in Vietnamese waters (seaport waters, territorial seas, and exclusive economic zones) if they do not comply with the provisions of the BWM Convention.
- Promoting research, scientific and technical cooperation with the Member States to exchange experiences, train PSCOs and technical staff, and encourage scientific research on ballast water management.
- Applying the exemption arrangements of the BWM Convention to ships engaged in only one voyage or voyages between specific ports or seaports; or for a vessel operating exclusively between ports or locations (negotiation of shipping agreements, bilateral agreements with the Member States exempting BWMS installation for ships sailing to a port, seaport or specific location).
- Suggesting and amending the provisions of the BWM Convention with the IMO to be more suitable with the actual situation in the region and internationally.

- Receiving technical assistance, coordination, and cooperation in the region from the IMO during the implementation of the provisions of the BWM Convention.

III.3.2 Obligations

- Taking measures to ensure the full implementation of its commitments to the provisions of the BWM Convention; specifically, Vietnamese fleets are obliged to meet regulations on the installation of a ballast water management system (BWMS).
- Taking responsibility for promulgating relevant legal documents for the assessment, inspection, and control of ships to ensure the implementation of the provisions of the BWM Convention;
- Promoting, researching, and developing standards and methods for ballast water management to prevent, reduce and eliminate the transport of harmful aquatic organisms and pathogens (HAOP) in compliance with the BWM Convention;
- Endeavoring to ensure not to cause harm or adverse effects to the environment, human health, property, or resources in the country or other States.
- Encouraging ships flying the Vietnamese flag, within the scope of the Convention, to limit as far as possible the intake of ballast water that is likely to contain HAOP, as well as sediments that may contain similar microorganisms, while fully implementing the recommendations issued by the IMO.
- Notifying control actions to ships under the inspection, and at the same time notifying the Administration of the ship inspected about the violation. In addition, notifying the vessel's ports of destination of all relevant information about the deficiencies for which the vessel is unable to rectify.
- Ensuring adequate resources are provided to carry out the inspection, issuance, and certification of IBWMC, including the training of Port State Control

Officers (PSCO) to perform the tasks of PSC inspection and measures for assessment, examination, and control.

- Participating in cooperation, coordination to provide support, exchange information, and actively cooperate to transfer relevant technologies based on national development policies and laws.
- Taking necessary measures to ensure the compliance of ships flying the Vietnamese flag and relevant Vietnamese organizations/legal entities or individuals with the provisions of the Convention; ensuring that ballast water management measures used in accordance with the Convention are no more harmful than measures to prevent adverse effects on the environment, human health, property or resources of the country or of other States.
- Promoting and facilitating domestic and international organizations and individuals to participate in scientific research on ballast water management.

CHAPTER IV: THE IMPORTANCE OF ACCESSION TO THE CONVENTION BY VIETNAM

Vietnam's waters are located on the world's maritime axis with heavy shipping traffic, which is a connecting point between Southeast Asian countries, Northeast Asia with the Pacific Ocean and Indian Oceans. Therefore, Vietnam is an important hub for transporting goods in the region and a growing shipping nation.

Consequently, the number of ships entering and leaving Vietnam's seaports is increasing day by day, which means that the country's exposure to marine pollution and biohazards increases. According to the report of the VINAMARINE, the number of foreign ships arriving at ports in the first six months of 2021 was about 24 758, an increase of 11% compared to the same period in 2020. Therefore, there is a need to address ship-generated pollutions and biohazards, such as the possible introduction of IAS in the ballast water that can be transported into the marine ecosystem of Vietnam.

IV.1 Potential threats of ship's ballast water on the biodiversity and ecosystem

According to the Center for Science and Technology Information and Statistics of Vietnam (CESTI), Vietnam's sea area has about 20 distinct ecosystems, including mangroves, coral reefs, lagoons, seagrass, intertidal and estuarine areas (CESTI, 2016). Vietnam's marine ecosystem is very rich and diverse; it plays a significant role in regulating climate and nutrition in the sea through biogeochemical cycles.

At the same time, these ecosystems bring great values and socio-economic benefits, with about 28 million people directly and indirectly affected in life. In 2009, Assoc. Dr Nguyen Chu Hoi - Deputy Director-General of the General Department of Seas and Islands of Vietnam, stated that "It is estimated that each year the profit from marine and coastal ecosystems of Vietnam is from 60-80 million USD, which is about 56–100 USD/year/family of residents living in coastal districts" (P. Nhung, 2016, p. 35).

Consequently, the uncontrolled discharge of ballast water and sediments can harm the ecosystem and related activities. Additionally, the introduction of HAOP is often irreversible, contrary to oil spills.

Indeed, the discharge of ballast water has become a risk and a challenge for Vietnam. Therefore, accelerating the process of joining the BWM Convention, along with raising awareness and taking effective measures in time, will be of great significance for the country in the future.

IV.2 The importance of maintaining the international shipping industry in Vietnam

According to a report from VINAMARINE, there are 1,593 Vietnamese vessels in operation with a total tonnage of nearly 7,806 million DWT, including more than 500 vessels on international routes. All of these ships are covered by the BWM Convention when operating in waters under the jurisdiction of a Contracting State, which means that these ships are required to install a ballast water management system (BWMS).

In fact, only a few large companies in Vietnam own general cargo vessels that can sail on routes to America and Europe, the rest of the Vietnamese fleet operates on regional trades (e.g., Southeast Asia routes and China). The ships operating on the international routes must comply with the provisions of the BWM Convention, even though Vietnam is not a contracting party.

According to a recent report by VINAMARINE, most Vietnamese ships are not equipped with BWMS. As of August 2019, only five vessels have installed BWMS (VINAMARINE, 2019). Shipping companies with large fleets have planned to install BWMS, such as Vietnam National Shipping Lines (VINALINES), GEMADEPT Shipping and Vietnam Petroleum Transport Joint Stock Company (VIPCO).

However, the effort cannot be limited to large national companies; other shipping companies need to actively invest in compliant equipment to avoid inspection risks and delays, and potential detentions in foreign ports.

In addition, companies should allocate funding to prepare and install BWMS because it is imperative for doing business. To maintain the international shipping activities of the Vietnamese fleet, there is no alternative way other than complying with the provisions of the BWM Convention. In other words, early accession to the Convention will ensure the rights and interests of the Vietnamese fleet and facilitate their international shipping operation.

Moreover, according to a report by the Department of Science, Technology and Environment (under VINAMARINE), the Vietnamese fleet accounts for only about 10% of the market share in import and export freight; the rest of the foreign fleet transports up to 90%. In other words, because Vietnam is not a party to the Convention, the State does not conduct PSC inspection on the foreign vessels under the provisions of the BWM Convention. Therefore, environmental control and protection in Vietnam will face many challenges and difficulties.

On the other hand, Vietnam must be a member of the BWM Convention in order to apply the exemption rules, where applicable, in accordance with Regulation A-4 of the Convention.

In summary, accession to the BWM Convention will create favorable conditions for Vietnamese ships in the international maritime activities, contributing to the protection of the marine environment and the country's socio-economic development. This is in line with the general trend of the global maritime industry, the process of international economic integration, and the improvement of Vietnam's position in the shipping sector.

IV.3 Vietnamese legal framework related to the BWM Convention

Currently, environmental rights have become constitutional rights, enshrined in the constitutions of more than 100 States, in which nearly two-thirds of the constitutional rights refer to a healthy environment. Alternative formulations include rights to a clean, safe, favourable, wholesome or ecologically balanced environment (UNEP, n.d.).

The 2013 Constitution of Vietnam emphasized this trend in the following in Articles 43 and 63:

- Everyone has the right to live in a healthy environment and has an obligation to protect the environment
- The State has policies on environmental protection to manage and use effectively and sustainably natural resources; nature conservation, biodiversity; proactively prevent and combat natural disasters and respond to climate change.
- The State encourages all activities of environmental protection, development and use of new and renewable energy.
- Organizations and individuals that pollute the environment, deplete natural resources and degrade biodiversity must be strictly handled and have the responsibility to remedy and compensate for damage.

On that basis, Vietnam is building a system of legal instruments to address environmental protection, including the BWM Convention (see Figure 5). The core content of these legal documents and their alignment with the BWM Convention are presented in the Appendix of this dissertation.

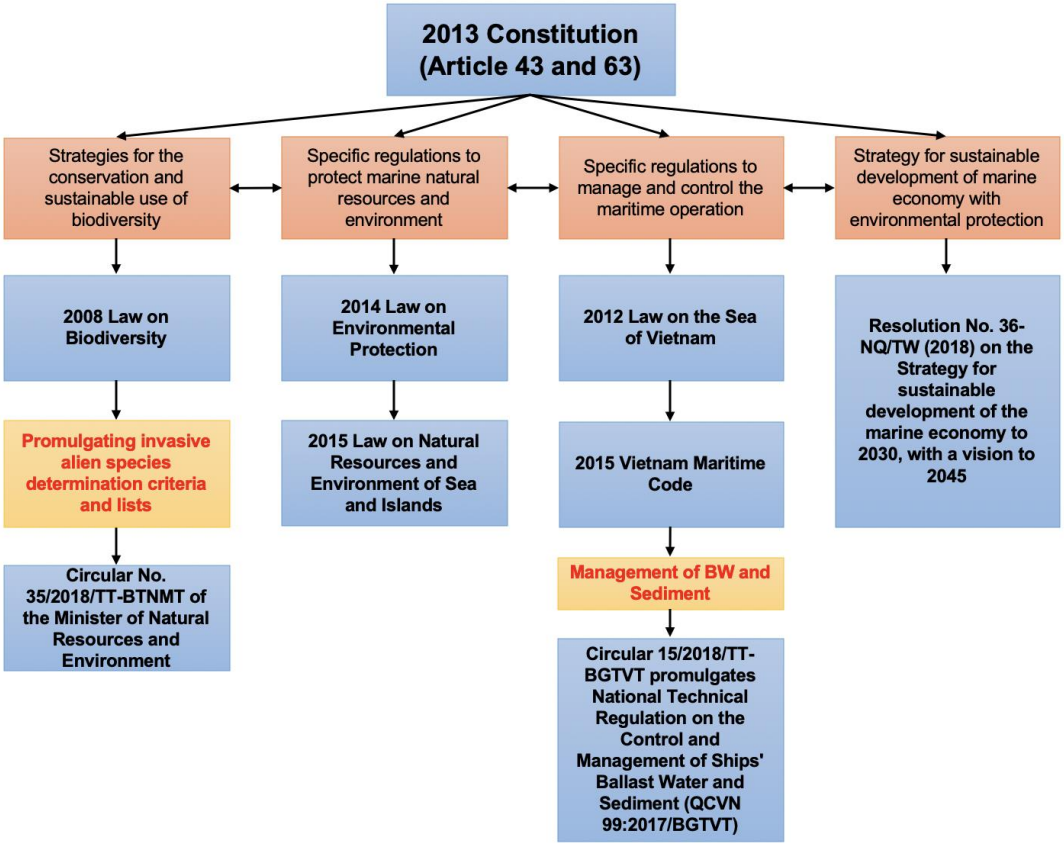

Figure 5: Vietnamese legal framework regulating environmental protection.
(The detail of the regulations are available in the Appendix of this dissertation)

Source: Author

Among the regulations of this framework, two are particularly important, ie one dealing with the management of invasive species and another one dedicated to BWM. The focus is now on the instrument related to BWM implementation.

The Circular 15/2018/TT-BGTVT of the Ministry of Transport is directly related to the implementation of the BWM Convention. This Circular promulgates the National Technical Regulation on the Control and Management of Ships' Ballast Water and Sediments (QCVN 99:2017/BGTVT). Because Vietnam has not joined the BWM Convention, this Circular is aimed at ensuring Vietnamese ships operating on international routes, especially to the Member States of the BWM Convention, fully

meet the regulations and standards of the Convention. The conformity of the Technical Regulation with the provisions of the Convention is shown in Table 1:

Table 1: Comparative analysis of the QCVN 99:2017/BGTVT and the BWM Convention

BWM Convention	QCVN 99:2017/BGTVT	Remarks
Article 1 Definitions	**Part 1 – General provision** 1.2.2 Definitions	Totally translated from the Convention.
Article 3 Application	**Part 1 – General provision** 1.1 Scope and Application This Regulation only applies to Vietnamese vessels operating internationally (specifically to Member State of the BWM Convention).	After joining the Convention, it is necessary to add the application to foreign ships operating in Vietnamese waters.
Article 4 Control of the transfer of HAOP risks through Ship's Ballast Water and Sediments	**Part 4, 5: Implementation and Enforcement** These Parts set out the responsibilities of shipowners, shipbuilding, repairing facilities, ship design establishment and manufacturers of ballast water equipment as well as the responsibility of Vietnam Registry (VR) for the technical survey, inspection and monitoring to ensure the compliance with the provisions of this Regulation.	After joining the Convention, it is necessary to add the provisions regarding the responsibility of PSC for the inspection of foreign ships arriving at Vietnamese ports.
Regulation A-3 Exceptions **Regulation A-4** Exemptions **Regulation A-5** Equivalent compliance	There has not been any regulation setting out the provisions of exceptions, exemptions and equivalent compliance.	After joining the Convention, it is necessary to add the provisions regarding these issues.

Regulation B-1 Ballast Water Management Plan	**Part 2: Technical Regulations** Chapter 9 requires the ships to have onboard a BWMP approved by VR and followed the prescribed content.	Totally translated from the Convention.
Regulations B-2 Ballast Water Record Book **Appendix II** **Regulations B-5** Sediment Management **Guidelines G-2** **Guidelines G-12**	**Part 2: Technical Regulations** Chapter 6 regulates Ballast Water Record Book (follow Appendix II of the Convention), Sediment Management (taking into account Guidelines G-12) and Ballast Water Sampling (comply with Guidelines G-2).	Totally translated from the Convention.
Regulations B-4 Ballast Water Exchange **Standard D-1** Ballast Water Exchange Standard **Guidelines G-6**	**Part 2: Technical Regulations** Chapter 7 governs Ballast Water Exchange (taking into account the Guidelines for ballast water exchange G-6) and Ballast Water Exchange Standard.	Totally translated from the Convention.
Standard D-2 Ballast Water Performance Standard **BWMS Code** **Guidelines G-9**	**Part 2: Technical Regulations** Chapter 8 regulates Ballast Water Performance Standard comply with D-2; BWTS approved by VR comply with Guidelines G-8 and G-9 of the Convention.	This Regulation needs to update the type approval for BWTS to comply with the BWMS Code instead of Guidelines G-8.
Article 7 Survey and certification **Regulations E-1** Surveys **Regulations E-2** Issuance or Endorsement	**Part 2: Technical Regulations** Chapter 2,3,4 and 5 of this Part are regulations on surveys for ships of 400 gross tonnage and above (initial, annual, intermediate and special surveys) that comply with IMO technical guidelines.	After joining the Convention, it is necessary to add the provisions regarding Article 7, Regulations E-1, E-2, E-3, E-4, E-5 and Appendix I; and convert the certificate of conformity into the international certificate

Regulation E-3 Issuance or Endorsement by Another Party **Regulation E-4** Form of Certificate **Regulation E-5** Duration and Validity of Certificate **Appendix I**	**Part 3: Regulations on management and certification** Chapter 1 is regulations on certification and Chapter 2 is regulations on document management. Although these above regulations are matched with the BWM Convention, Vietnam has not joined the Convention; therefore, VR can only issue a certificate of compliance to Vietnamese ships under the Regulation's technical requirements instead of an international certificate of compliance with the BWM Convention.	of compliance with the BWM Convention.

Source: Author

In summary, the legal framework of Vietnam, from the constitution to the legal documents, is relatively tight and consistent with the goal of sustainable development and environmental protection including the BWM Convention. Promulgating legal documents is not enough; it is crucial to ensure effective implementation and enforcement. Therefore, Vietnam needs to strengthen the inspection, supervision, and evaluation of law enforcement effectiveness and apply strict sanctions to handle violations.

IV.4 Review of the current situation in Vietnam for the accession and implementation of the 2004 BWM Convention

Based on aggregated data and reports from MOT, VINAMARINE and the results of Vietnam National Action Plan in the project of Marine Environment Protection of the South East Asian Seas (MEPSEAS), Table 2 shows the current situation in Vietnam for the accession and implementation of the BWM Convention.

Table 2: Current situation in Vietnam for the accession and the implementation of the BWM Convention.

Action	Result	Progress
Authorization to study and propose accession to the BWM Convention		
Authorized agency decision	The MOT issued Decision No. 633/QD-BGTVT on March 30, 2018, assigning the VINAMARINE to study and propose the accession to the BWM Convention.	Done
Establishment of NTF or similar mechanism for BWM		
1) Establish VINAMARINE's Task Force	The VINAMARINE issued Decision No. 1832/QD-CHHVN on November 6, 2018, establishing VINAMARINE's Task Force to propose the accession and implementation of BWM.	Done
2) Drawing up the Term of References (TOR) for the core team members	The VINAMARINE's Task Force leader also drew up the TOR for the core team members.	Done
3) Organizing the meetings of the core team	The Meeting has been held six times: - October 29, 2018: discussed an establishment of a core team to research, propose to join and implement the BWM Convention; - November 16, 2018: discussed a drawing up the TOR for the research core team, proposed to join and implement the BWM Convention; - December 03, 2018: discussed a draft National Action Plan content; - May 23, 2019: discussed a training in the BWM Convention; - August 05, 2019: reviewed content of the proposal to join the Convention and prepared the necessary works for the consultation workshop with relevant agencies and units;	From 2018, Ongoing

	- August 20, 2019: discussed contents related to proposals and recommendations of related agencies to complete the draft to submit to the MOT.	
Reviewing, completing the legislation system		
1) Reviewing, completing the legislation system, the national technical standard on the ballast water, which is environmentally harmful	- Proposed to promulgate the Circular to replace Circular No. 41/2016/TT-BGTVT dated December 16, 2016, of the MOT on the list of certificates and documents of vessels and mission vessels, submarines, diving ships, floating storage units, mobile offshore drilling units of Vietnam, accordingly proposed additional certificates, documents related to the BWM Convention. - Reviewing Circular No. 15/2018/TT-BGTVT dated April 04, 2018, issues the National Technical Standard of Ballast Water Management QCVN 99: 2017/BGTVT. - Reviewing the provisions of Vietnam's Maritime Code, 2014 Law on Environmental Protection and its guiding documents under the Code and the Law.	Regularly, From 2018, Ongoing
2) Updating the new IMO regulations for the BWM Convention and informing all stakeholders	Updating the new IMO regulations to complete the file submitted for proposal to join the BWM Convention and informing all stakeholders at the seminar on August 7, 2019.	From 2019, Ongoing
3) Drafting the national legislation	1. Proposed promulgation of Circular No. 55/2019/TT-BGTVT dated December 31, 2019, replacing Circular 41/2016/TT-BGTVT dated December 16, 2016, of the MOT on the list of certificates and documents of vessels, mission vessels, submarines, diving ships, floating storage units, mobile offshore drilling units of Vietnam, which have supplemented the certificates and documents that must be on the vessels of Vietnam include: - Certificate of ballast water conformity management applicable to vessels of 400GT or more operating to ports of the Member States;	From 2019, Ongoing

	- BWMPs apply to vessels of 400GT or more operating to ports of the Member States. 2. Reviewing and completing a draft of Decision of the Prime Minister approving the Plan for the implementation of the BWM Convention. 3. Proposal to supplement the provisions on ballast water management in the revised Law on Environmental Protection, specifically the additional proposal that BWM must be handled in accordance with the Waste Management Regulations of foreign vessels and Vietnamese vessels operating on international routes. Currently, the revision draft of the Law on Environmental Protection is being consulted widely.	
Conducting additional studies on the impacts of the BWM Convention		
1) VINAMARINE's Task Force Meeting 1&2 (2019)	- August 5, 2019, held meeting to review the contents of the file of the proposal to join the BWM Convention and prepared the necessary works for consultation of agencies and units dated August 7, 2019. - August 20, 2019: held meeting to discuss the contents relevant to proposal and recommendation of the related agencies to complete the draft submitted to MOT.	2019
2) Additional study for BWM Convention ratification	- Reviewing the necessary requirement and purpose of joining the BWM Convention. - Reviewing the legislation documents of Vietnam which are relevant to the regulations of the BWM Convention and assessing the appropriate between regulations of the BWM Convention and regulations of Vietnam. - Assessing the political, defense, security, socio-economic and other impacts upon joining the BWM Convention.	2019

	- Assessing the compatibility of the BWM Convention with international treaties in the same area to which Vietnam is a member. - Conducting surveys of shipping enterprises on plans to install BWTS for the fleet, as well as the operating routes of the fleet.	
3) VINAMARINE's Task Force meeting 1 (2020)	Held VINAMARINE's Task Force meeting on January 14, 2020 to review the implementation of the National Action Plan; discussed the Proposal to join the BWM Convention, received and explained the opinions of agencies and units.	2020
4) Completion of the draft final proposal	Currently receiving and explaining the consultation of agencies and units regarding the proposal to join the BWM Convention, the VINAMARINE has only received 21 consultation from the agencies and units, which are still continuing receive consultations to complete the draft proposal.	From 2019, Ongoing
5) Consultation by questionnaires with stakeholders in the maritime sector	- The VINAMARINE has sent a document No. 3434/CHHVN- KHCNMT for consultation by questionnaires with agencies and enterprises on the draft Proposal of joining the BWM Convention (the first time). - The VINAMARINE has sent a document No. 180/CHHVN- KHCNMT dated January 10, 2020, for consultation by questionnaires with agencies and enterprises on the draft Proposal of joining the BWM Convention (the second time).	From 2019, Ongoing
6) Consultation meetings of stakeholders in the maritime sector	Held consultation meetings of relevant stakeholders on August 7, 2019, at VINAMARINE.	2019
7) Completion of the proposal to access the BWM Convention and submit to MOT	It is expected that in April 2020, VINAMARINE will complete the file and submit to the MOT. However, this will be delayed and expected to move to 2021 due to the Covid 19 Pandamic.	From 2020, Ongoing

8) Consultation to relevant Ministries and People's Committees of provinces and cities on the proposal to join the BWM Convention;	It is expected that in June 2020, the MOT will take the consultation to relevant Ministries. However, this will be delayed and expected to move to 2021 due to the Covid 19 Pandamic.	From 2020, Ongoing
9) Consolidates the proposal to send to Ministry of Justice and Ministry for Foreign Affairs for the latters' appraisal on the Convention's consistency with other laws of Viet Nam and international treaties and conventions.	It is expected that in August 2020, the MOT will take the consultation and appraisal from the Ministry of Foreign Affairs and the Ministry of Justice. However, this will be delayed and expected to move to 2021 due to the Covid 19 Pandamic.	From 2020, Ongoing
10) Completion of the proposal to access the BWM Convention and submit to PM	Not done yet	Ongoing
11) Prime Minister's approval of the Proposal	Not done yet	Ongoing
12) Procedure for accession with International Maritime Organization	Not done yet	Ongoing
Port/Flag Control Procedures		
1) Drawing up Guidelines for the	Not done yet	Ongoing

inspection, evaluation and issuance of international certificates for vessels		
2) Drawing up Guidelines to conduct PSC	Not done yet	Ongoing
3) Drawing up FSI and PSC processes and procedures for BWM	Not done yet	Ongoing

Source: VINAMARINE and Author

In general, Vietnam has been working hard on preparing for the implementation of the BWM Convention. Because several contents are still pending (as mentioned in the above table), the analysis estimates that Vietnam is about 80% in line with the implementation requirements, so Vietnam is almost ready for the accession to the Convention. However, there are still some issues related to receiving comments from shipowners and other national stakeholders. This delays the ratification process. Additionally, the draft accession to the Convention needs finalization. Finally, the Port/Flag control procedures and staff training requirements are still pending. Therefore, relevant functional agencies need to focus on implementing and completing the remaining contents to accelerate the accession to the Convention.

CHAPTER V: CHALLENGES IN IMPLEMENTING THE CONVENTION

V.1 Challenges for the Government

For Vietnam and many States, the governments and economic elites think that environmental protection is a luxury that can only be targeted after the rising of the economy (Grubb et al., 1993; Desai, 1998). Even developed countries (e.g., the United States) have difficulties in protecting their environment when it can be perceived at the expense of economic growth (Beckerman, 1974).

Accelerating economic development has always been a top priority for all countries; therefore, the neglect of environmental protection in general, and the dangers of IAS in particular, become very common, and Vietnam is not an exception. The consequence is that the damage caused by IAS through ballast water is up to 10 billion USD per year globally (Marbuah et al., 2014).

In addition, the MONRE's report sent to the National Assembly deputies serving the 8th National Assembly session, the XIV National Assembly in 2019 notably indicated that the revenue from the environment had not been used to reinvest in environmental protection.

While in ASEAN countries, the average annual investment in the environment accounts for over 1% of GDP, developed countries usually account for 3-4% of GDP. Additionally, the report also indicated that the state management system on the environment is still not synchronized and unified from the national to local levels, and not kept in pace with the increasingly complex developments of environmental problems. The force of environmental managers is still too small compared to the requirements, while the qualifications and management skills are still weak, especially in the localities.

In such context, protecting the marine economy while preserving the environment seems currently uneasy in Vietnam.

Another issue detrimental to the management of ballast water is the lack of visibility into the impact of IAS except when the damage is becoming massive and irreversible (Karahalios, 2017).

Therefore, managing and controlling the ships' ballast water need the government's attention in terms of research and implementation.

Limited investment in environment protection

Although environmental protection is said to be one of the top concerns in Vietnam, funding for environmental protection is still meagre. According to the Government's report on environmental protection in 2017, ministries and sectors need 853 billion VND to implement environmental protection activities. However, due to limited budget conditions, they only allocate about 469 billion VND (meeting 55% of demand).

Consequently, the investment and development of research activities and implementation of environmental protection in general and IAS prevention in particular still face many challenges.

Focus on national shipping protection

The second issue is the responsibility of the government for the survival of domestic enterprises. Although the government wants to preserve the marine environment, there is a relative obligation to protect shipping companies (Yang, 2014). This is true in Vietnam, particularly when shipping companies claim facing financial difficulties and lack of human resources. Additionally, the impact of the Covid-19 pandemic has been claimed by shipowners as an obstacle to changes.

Further, the implementation of the BWM Convention seems challenging. Under the Convention, the entire fleet of ships operating on international routes must comply with its provisions and by 2024 must be equipped with the BWTS (D-2 Standard as mentioned in Section III.1).

With that "not small" investments, the early accession to the Convention may affect the survival of small and medium enterprises. When businesses fall into a state of crisis, they cannot pay bank interest or state loans, leading to more concerns for the government.

In addition, ports have to invest, whenever needed, in sediment reception facilities.

Legal and regulatory challenges

The third issue relates to the implementation of the Convention. Currently, national legislation requires adjustment to ascertain that authorities will overcome challenges such as inspection, supervision, and handling the incidents. No legal documents are setting out a management strategy for preventing IAS from ballast water to support the decision-makers along the invasion chain, including prevention, early detection, rapid response and eradication, control/mitigation, and adaptation. Furthermore, other relevant legal documents also need to be continuously updated, revised, and supplemented to comply with the provisions and subsequent amendments of the BWM Convention.

National coordination

The last issue is the lack of effective coordination between ministries, agencies, and competent authorities on the topic. Currently, Vietnam does not have a National Task Force (NTF) that can support the development of a national strategy for responding to HAOP risks (Tamelander et al., 2010).

In Vietnam, VINAMARINE is responsible for monitoring and managing ballast water and at the same time as VR is in charge of design appraisal, inspection, and technical supervision for BWMS. However, MONRE is the main body responsible for handling environmental issues, including the discharge of ship ballast water into the sea.

In case of epidemics or IAS, they should be subject to the management of the General Department of Customs (GDC). In case of causing environmental problems, the investigation and identification of IAS should fall under the responsibility of the MONRE, the Ministry of Agriculture and Rural Development (MARD) and Ministry of Health (MOH). Finally related marine equipment is under the Ministry of Science and Technology (MOST).

Due to different management purposes, each department only pays attention to a specific aspect, leading to a lack of communication and coordination among them. Moreover, the asynchronous management model easily forms overlaps or loopholes.

V.2 Challenges for maritime authorities

The first crucial task is the dissemination of national and international legislation, including the BWM Convention, to all maritime enterprises and stakeholders. However, the number of officers engaged in legal propaganda is still small and mainly concurrent tasks, which leads to difficulties in researching, compiling documents, and providing legal support for enterprises (VINAMARINE, 2020a). Moreover, due to the weakness in the management capacity and initiative, the staff of small and medium-sized enterprises are still limited in researching and applying the law (VINAMARINE, 2020b).

Another important task is ensuring all ships flying Vietnamese flags comply with the BWM Convention and related national regulations. However, there is a limited number of inspectors available in the 25 Local Maritime Administrations (under VINAMARINE) because they carry out a large number of PSC inspections as well as

concurrently performing other tasks in the maritime management system, including seaport management, search and rescue, and disaster prevention.

In addition, guidelines to the inspection, evaluation, and application of international certificates for vessels for the VR and guidelines to conduct PSC for the VINAMARINE have also not been developed under the BWM Convention. In addition, the PSCOs and the surveyors need to be trained and updated with knowledge related to the inspection and survey of ships under the BWM Convention's regulations. Additionally, the maritime agencies lack the equipment to inspect and certify ships according to the Convention's provisions.

Finally, it is also vital to ensure that all crew members working on the ships flying the Vietnamese flag must be familiar with the ship's BWMP and thoroughly trained to implement the BWMP and related safety procedures. However, the lack of attention from shipping enterprises and the significant impact of the Covid-19 pandemic have led to more difficulty implementing this matter.

V.3 Challenges for shipping companies

The implementation of the BWM Convention and other maritime conventions has posed many challenges for the shipping enterprises. The two main challenges are the inadequate quality structure of the fleet and the financial crisis.

V.3.1 The mismatch in the quality structure of Vietnamese fleet

According to the VINAMARINE statistics, from 2013 to now, the Vietnamese fleet has decreased by 212 ships. Although the Vietnamese fleet ranked third in the ASEAN region and 29th globally by carrying capacity in dead-weight tons (UNCTAD, 2020), the VINAMARINE assessed that the international competitiveness of the Vietnamese fleet is still weak.

The majority of Vietnamese shipowners are small; out of 1,049 cargo ships, there are 550 shipowners. Only about 30 shipowners have a fleet of over 10,000 DWT, which means that more than 70% are ships of less than 5,000 DWT (Ministry of Transport, 2021).

In addition, the fleet failed to develop in line with the global trend of containerization. The Vietnamese container fleet has only 38 ships, accounting for a small proportion (3.7%) in the number of the cargo fleet (comparatively, the world's container fleet accounts for 13% of the fleet). Thus, the development of the Vietnamese fleet is increasingly separate from the world fleet. Consequently, the market share of import and export freight transport of the Vietnamese fleet is decreasing, from 10% (in 2015) to only 5% (in 2020) (N. Khanh, 2021).

Although there are more than 500 Vietnamese ships operating on international routes within the scope of the BWM Convention, the actual number of Vietnamese ships in developed countries, such as Japan, Korea, Europe and North America), is significantly decreasing because their technical conditions do not meet the required standards (Quoc Dung, 2021). Further, Vietnamese ships face many difficulties when arriving in these countries, including the risk of being detained if inspected by PSC.

V.3.2 Financial difficulties for shipowners

The downturn in the shipping market has lasted from 2008 to now, making enterprises almost exhausted in terms of financial and material resources, which affects the implementation of international maritime conventions, including the BWM Convention.

Many big shipping companies such as Vietnam Sea Transport and Chartering Joint Stock Company (VITRANSCHART JSC), Northern Shipping Joint Stock Company (NOSCO), Viet Hai Shipping & Real Properties Corporation (VSP), Seagull Shipping

Company (SSG), and Vinaship Shipping Joint Stock Company (VINASHIP) are continuing to face financial difficulties.

Many businesses invested in ships in a rush and lack of orientation and long-term market assessment led to the decision to buy old ships, most of which were over 15 years old (Vu, 2008). The acquisition of old ships will increase operating and maintenance costs, leading to low operational efficiency. The inevitable consequence was a financial crisis for the fleet as the revenue source is not enough to cover essential costs, such as wages, insurance, fuel, supplies, and repairs (Hoa Binh, 2017).

From 2016 to 2020, Vietnamese ships entering and leaving the country decreased by 40% (see Figure 6). The decline in international shipping also explained the poor management of shipping enterprises. The "hot development" without the "right vision" made most of the small and medium enterprises unable to meet international standards which affect their business opportunities.

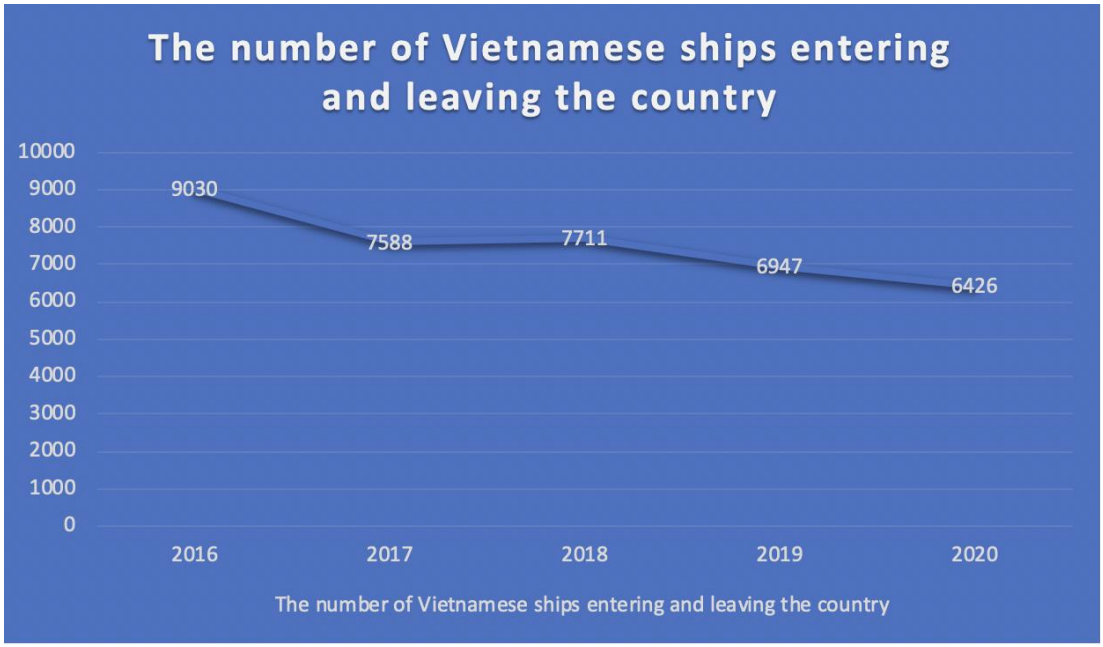

Figure 6: The number of Vietnamese ships entering and leaving the country

Source: VINAMARINE's statistical reports in 2016, 2017, 2018, 2019, 2020

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Regarding the installation of a BWTS, ships of less than 2,000 DWT have to spend 100,000 USD for such a BWTS. The investment cost can go up to over 1 million USD for large ships from 100,000 to 200,000 DWT (Phuong Anh, 2019). Especially, investing in BWMS becomes a challenge for small and old ships (estimated at 2,000 billion VND or 90 million USD), particularly in the context of adaptation to new sulfur rules (according to the dispatch of the Vietnam Shipowners Association (VSA) sent to the MOT in August 2019).

However, the "Polluter-pays principle" is crucial and must be applied in all circumstances. Shipowners have to take responsibility for their business operations, which have a considerable impact on the marine environment and the lives of millions of coastal residents. Moreover, with the nature of international transport, failure to comply with regulations will cause harm to not only a few countries but also all other countries in the world. The investment cost for equipment cannot be compared with the loss related to the consequences of HAOP through the ship's ballast water and sediments. Therefore, shipping enterprises must take responsibility to comply with the BWM Convention.

V.4 Challenges for seafarers

Among the stakeholders, some of the most affected are seafarers because they are directly in charge of operating the ships and implementing regulations in practice.

Firstly, the new regulations of the BWM Convention will increase the crew’s workload, including the operation of the BWMS, BWE operations, maintenance, coordination in PSC inspection, and more paperwork; consequence, it directly affects rest time and increases crew stress (Phiwphan, 2018).

Another challenge is training for seafarers concerning the BWM Convention on the operation and maintenance of new equipment, and coordination in PSC inspection by

the port states. Especially the negative impact of the Covid-19 pandemic has done training for seafarers more challenging than ever.

Additionally, there is an increase of occupational risk to seafarers when operating the system (see Figure 7), especially for BWTS that use chemicals.

Unit Operation	Work Activity	Exposure Scenario	Exposure Route
Starting of BWMS	type specific activities to be documented, e.g. calibration	type-specific	dermal, inhalation
Ballasting	ballasting	potential exposure to volatile substances from exhaust air	inhalation
	treating of ballast water	type-specific	dermal, inhalation
	sampling	exposure to chemicals in treated ballast water	dermal, inhalation
De-ballasting	de-ballasting	potential exposure from spray drift	dermal, inhalation
	treating of ballast water	type-specific	dermal, inhalation
	sampling	exposure to chemicals in treated ballast water	dermal, inhalation
Cruising	storage of treated ballast water	potential exposure to volatile substances from exhaust air	inhalation
	sampling	exposure to chemicals in treated ballast water	dermal, inhalation
Maintenance	tank cleaning (sediment cleaning)	exposure to residual water, sediment and vapour of volatile substances in ballast tank	dermal, inhalation
	tank inspection	exposure to vapour of volatile substances in ballast tank	inhalation
	type specific: UV: change/cleaning of UV tubes ozone: filter change, electrode calibration chemicals: resupply, cleaning of storage tanks electrolysis: washing of filter cartridges, electrode calibration	type-specific	dermal, inhalation
Malfunctions	any of the listed work activities or independent thereof	leakage, ventillation breakdown	dermal, inhalation
Accidents	any of the listed work activities	e.g. splashing of chemicals during resupply	dermal, inhalation
Emergencies	distress and salvage operations	e.g. explosion, fire	dermal, inhalation

Figure 7: Risks for seafarers in BWM work activities

Source: Werschkun, B et al., 2014

Moreover, although both the workload and the level of risk level increase, the salary and welfare of seafarers working on the Vietnamese fleet are still too low and not comparable with the nature of the work. This leads to more and more seafarers

choosing to work for foreign fleets with salaries and benefits much higher than Vietnamese shipping companies.

In summary, seafarers as the key workers of the maritime industry need to be given more attention so that they can be motivated to continue contributing to the domestic and international maritime industry. In addition, there is a need for coordination between businesses and maritime authorities in training seafarers regarding the BWM Convention to enhance efficiency and safety while working. Finally, the government and the maritime authority need to focus on upgrading policies and welfare for seafarers and shipping enterprises need to improve the working and living conditions of seafarers.

CHAPTER VI: POTENTIAL SOLUTIONS TO FILL THE EXISTING GAPS

VI.1 Recommendations to the Government

VI.1.1 Further enhancing the importance of environmental protection

The first thing is to promote the implementation of the dual goal of the promotion of marine economic development and environmental protection.

To do this, the National Assembly should consider increasing the expenditure from the state budget for environmental protection, striving to reach at least 2% of the total budget as well as ensuring the rational and effective use of environmental funds (Thu Thuy, 2021).

In addition, the promulgation of legal documents will be meaningless if the enforcement is not effective. Therefore, the government needs to strengthen the inspection, supervision, and evaluation of law enforcement, as well as applying strict sanctions to handle violations.

Finally, the focus on environmental protection will support the country's capacity in addressing environmental issues, including IAS.

VI.1.2 Developing National Ballast Water Management Strategy

Firstly, the Government should consider developing a National Ballast Water Management Strategy (NBWMS). The 5-step model for strategy formulation is based on IMO guidelines (see Figure 8).

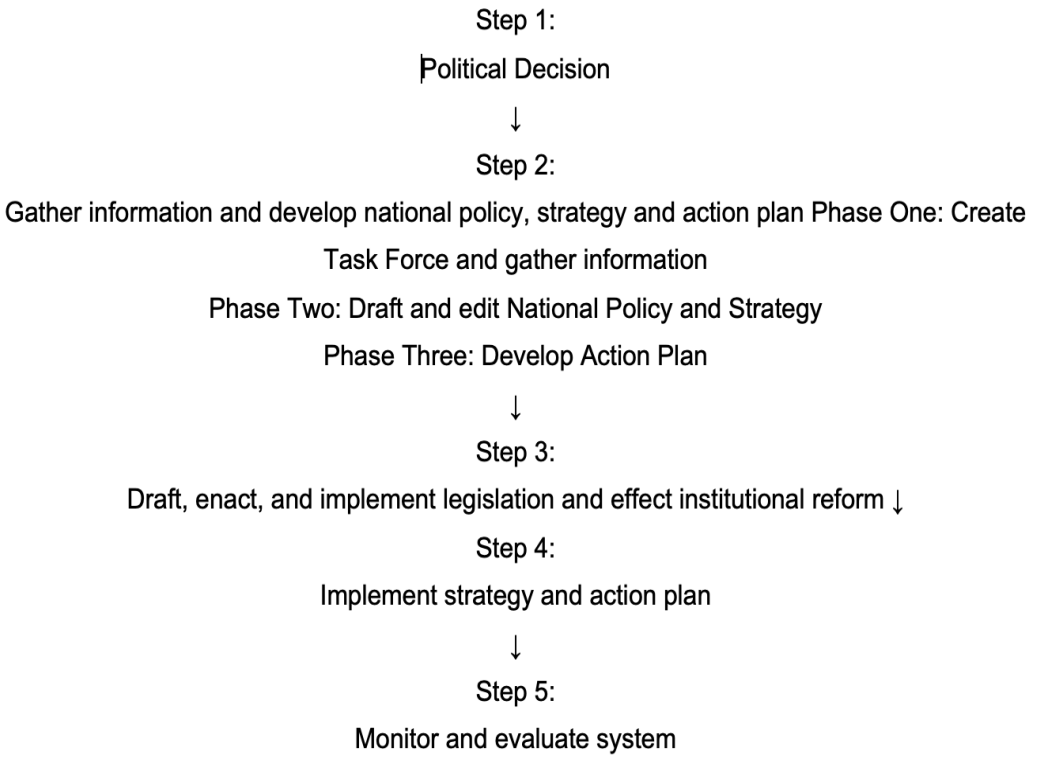

Figure 8: Five steps to develop the NBWMS

Source: GloBallast Monograph Series No.18

This NBWMS will provide a solid foundation for the comprehensive and practical study, discussion, agreement, enactment, implementation, and monitoring of BWM and responding to IAS.

The NTF establishment will bring all the key stakeholders together, leading by a Lead Agency (LA), and by using their combined expertise regarding BWM and IAS (see Table 3).

Furthermore, the construction of the NTF is also a tool to ensure resources, institutions, and finance for implementing the policies, strategies, and legal regulations in the most effective way.

Table 3: Recommendation on the key stakeholders of NTF

No	Role	Relevant Stakeholders
1	Lead Agency	- VINAMARINE (delegated agency of MOT) or - Vietnam Environment Administration (delegated agency of MONRE)
2	Public Sector	- Ministry of Health of Vietnam - Ministry of Agriculture and Rural Development - Ministry of Finance - General Department of Customs - Directorate of Fisheries - Local Maritime Administrations
3	Private Sector	- Port enterprises - Shipowners - Maritime agencies - Shipyards - Shipbuilders
4	Civil Society and NGOs	- Vietnam Maritime University - Ho Chi Minh University of Transport - Shipowners Association of Vietnam - Shipmasters and seafarers Association of Vietnam - Vietnam Fisheries Society - Vietnam Tourism Association - Shipbuilding and naval architects associations

After completing the above organizational structure, another important task is to systemize and build management strategies for the decision-maker along the invasion chain (see Figure 9).

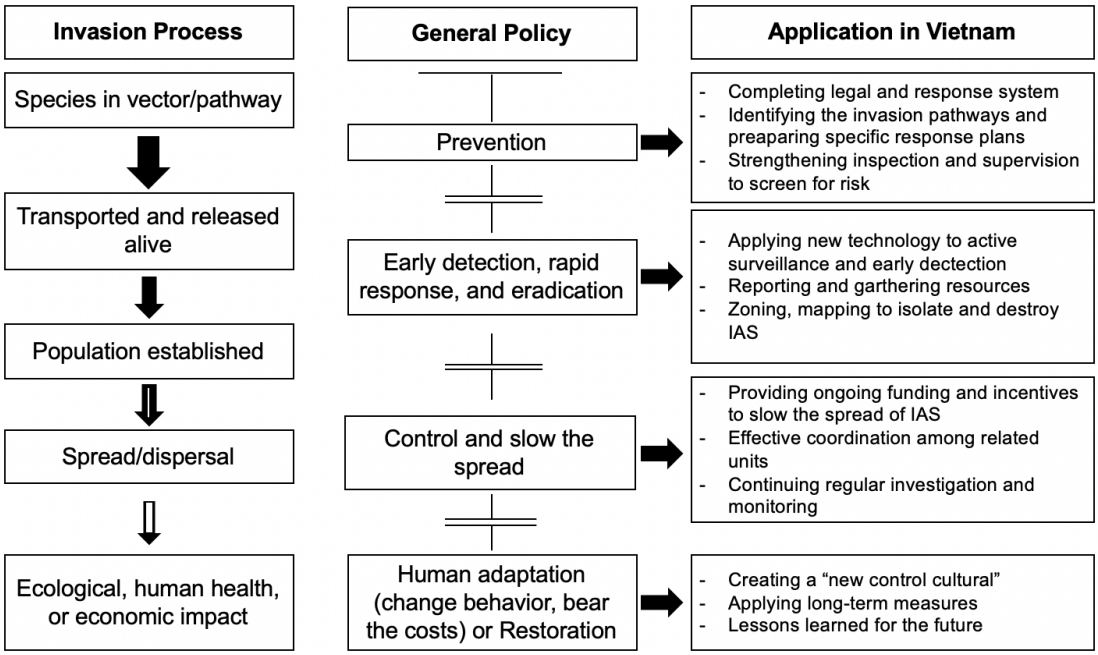

Figure 9: Stages of invasions & general policies related to each stage

Source: Lodge et al., 2006

The above scheme (Invasion Process and General Policy) was given by Lodge et al. (2006), and it is applicable to Vietnam.

For each stage in the invasion process, there will be corresponding stages (right column) as follows:

- Stage 1: Completing legal and response system regarding IAS; identifying the invasion pathways and preparing specific response plans for each path; and strengthening inspection and supervision to screen for risk.
- Stage 2: Investing and applying new technology to active surveillance and early detect the risk of IAS; reporting and gathering resources (human, equipment, funding resources) to respond as soon as possible; zoning, mapping to isolate and eradicate IAS.
- Stage 3: Providing ongoing funding and incentives to slow the growth and spread of IAS; promoting effective coordination among related units and

continuing regular investigation and monitoring the spread of IAS to other regions.

- Stage 4: Creating a "new control cultural" to guide locals in dealing with a new IAS; researching and applying long-term measures (example: use of pesticides and harvesting the IAS (Perrings, 2005); and learning from the incidents to improve the prevention and response system in the future.

In addition, the Government needs to invest in port reception facilities for sediment but only in ports where ballast tank clean-up or repair are to be made. As it is late to invest in developing new BWMS, Vietnam should focus on investing in testing systems to facilitate port inspections.

In addition, there should be contingency plans and funds ready to deal with environmental problems.

Finally, IAS being a global problem, Vietnam should enhance international and regional cooperation on the issue. To monitor its own water and detect biohazards at early stage, Vietnam needs to conduct Port Biological Baseline Surveys (PBBS) to provide inventories of marine life in and around Vietnamese ports. After that, sharing information among the countries will support port authorities and lead agencies to understand the current distribution of non-indigenous species (NIS) and harmful species within the port and surrounding areas, including those that may have been introduced by shipping.

VI.1.3 Strengthening the legal document system regarding ballast water management

Although the legal system has been supplemented and amended, some points need adjustments to avoid inadequacies in the implementation process. Therefore, it is necessary to enhance the legal system before and after Vietnam acceded to the BWM Convention.

The Government should consider the following items:

- Strengthening the state management of marine environmental protection from maritime activities and other sectors related to the use of the sea.
- Developing and completing a legal document system following the provisions of the BWM Convention and its Guidelines.
- Organizing and assigning agencies and organizations to amend or promulgate new legal documents, technical regulations, and guidelines on the maritime domain environment under the BWM Convention.
- Strengthening international cooperation, regularly exchanging information with other countries on ballast water and treatment technology, jointly promoting information exchange, technical cooperation, and learning experiences. Proposing IMO support to organize training courses at national or regional levels for the port authority and relevant agencies.

VI.1.4 Helping businesses overcome challeneges under conditions

First and foremost, helping businesses must be for the proper purpose, suitable and reasonable in each specific condition and situation. The Government should pay attention to the responsibility of the flag state to other countries in the world. Therefore, supported businesses must meet all the appropriate conditions and have a commitment to comply with relevant domestic and international laws, including environmental protection.

The Government may consider the following recommendations in working to support businesses under the conditions:

- The government should consider restricting the shipping sector and eventually supporting fleet renewal projects as well as tax facilitation and customs incentives or exemptions for importing the BWTS.

- The government may assign the State Bank of Vietnam to study and propose solutions for shipping enterprises to borrow capital from the Local Development Investment Fund (which is an off-budget state financial fund established by the provinces, operating for non-profit purposes, performing local lending and investment functions according to Decree No. 147/2020/ND-CP), or having mechanisms and policies for commercial banks to support them to borrow capital at preferential interest rates to reinvest the fleet (Phi Long, 2019).
- The Government should encourage domestic ocean-going shipbuilding and prioritize capital support for the purchase of domestically built ships. However, the State should reconsider setting domestic shipbuilders' prices to compete with foreign shipbuilders.
- Finally, it is essential that designated seaports should be supported in equipping systems to clean or repair ballast tanks and reception facilities of sediment according to the BWM Convention and its Guidelines (G1 and G5).

VI.2 Recommendations to the Maritime authority

On March 30, 2018, the MOT issued Decision No. 633/QD-BGTVT, which assigned the VINAMARINE to study the accession to the BWM Convention and submit its assessment to the MOT, and to the Government for approval. Therefore, VINAMARINE should speed up its assessment to join the BWM Convention as soon as possible. Besides, VINAMARINE needs to coordinate with VR and other relevant stakeholders on implementing some of the following contents.

Promoting the dissemination of relevant legal documents

First, conferences should be regularly organizied to propagate national legal documents and IMO Guidelines regarding the BWM Convention's implementation to all relevant stakeholders to keep them updated with new regulations. This is also to receive all the problems from the stakeholders as well as finding suitable solutions.

Second, effectively operating information technology utilities should be created to post information and receive feedback on the web portal of VINAMARINE (www.vinamarine.gov.vn) and VR (www.vr.org.vn) and other platforms.

Working closely with the MEPSEAS project

Recognizing the great benefits and outcomes of the MEPSEAS project to Vietnam in preparing for accession and implementation of the Convention, it is a must to work closely with the project to complete the remaining parts, as well as obtaining support from international experts in the field.

Updating knowledge for human resources

First, the Flag State inspection regime to survey ships under BWM Convention should be strengthened to be ready for certification after accession to the Convention. In addition, it is necessary to instruct and train PSC inspectors before the ratification of the Convention. Therefore, it is essential to develop the necessary legal backing and technical knowledge for PSCOs and surveyors.

Second, educational institutions should be consolidated to provide professional training for seafarers regarding the BWM Convention. Maritime Education and Training institutions need to promote training and professional skills for seafarers related to BWM.

Continuing the study of the same risk areas

Based on the research results on the ecological similarity of the same risk areas (SRA) in Southeast Asia, the VINAMARINE needs to coordinate with other relevant stakeholders on reviewing, studying, and recommending an exemption for Vietnamese ships operating only between ports located in the SRAs after joining to the Convention.

VI.3 Recommendations for shipping companies

VI.3.1 Restructuring the fleet in line with the general trend of the world

In line with the general trend, the Vietnamese fleet needs to be restructured in order to rapidly increase the market share of the country's import and export cargo transport.

In order to increase the competitiveness of the Vietnamese fleet, it is important to invest in fleet rejuvenation equipped with approved BWM systems.

Shipowners, small and medium-sized shipping companies with limited capacity should consider choosing a reasonable form of operation (see Figure 10).

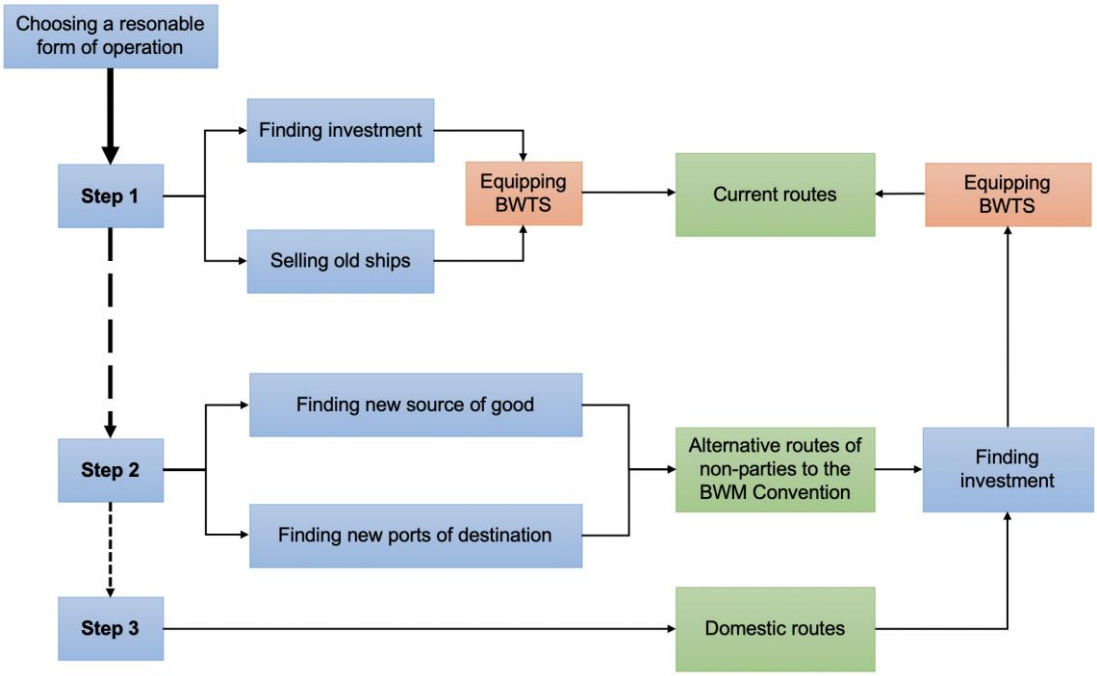

Figure 10: Three steps to consider a reasonable form of operation

Source: Author

- In the first step, businesses need to make efforts to find investment or consider selling old ships to buy new ships and equip their fleet with BWTS.
- If the first step fails, businesses need to consider finding new sources of good and/or new ports of destination to change routes to countries that are not

currently a member of the BWM Convention (but this is only provisional, as sooner or later those countries will accede to the Convention).

- If the second step fails, businesses may consider moving back to operate in domestic routes.
- However, in the future, if an investment is found, they can equip the BWTS and come back to the previous routes.

VI.3.2 Smart selection of BWMS and promotion of national BWMS

Firstly, shipowners and shipping companies must consider carefully before deciding to buy a BWTS. The selection criteria should be based on the specific technical status of each ship to install an appropriate system. National research team may be established with the support of VR to assist shipowners.

There are ten issues needed to consider for choosing a suitable BWTS for a particular ship as shown in Table 4 (Lloyd's, 2011).

Table 4: Ten issues to be considered for chossing a suitable BWTS

No	Issue	Explaination
1	Is the BWTS approved?	"Type Approval Certificate" must be issued by the flag state or a Recognized Organization (RO) (under the BWMS Code). If the system uses an active substance, this needs to have obtained final approval from the IMO before the certificate can be given (under the Guidelines G9).
2	Does the BWTS have enough total capacity rate (TCR) for the ship?	TCR must be high enough to handle the ship's ballast capacity and operational pumping rate.
3	Is it gas safe	For tankers, if the system is installed in a dangerous gas area (i.e., in the cargo area), it must be certified “gas safe”.
4	How much space does the system need?	Depending on TCR, some are single units while others can be installed as separate components.

5	What are the capital and operating cost?	The price of a BWTS depends on the manufacturer, while its operating cost depends on the type of system.
6	Does the ship have enough power available?	Some systems have very high power requirements. It is a need to check if the ship must run another generator.
7	Will the system integrate with other existing systems?	Integrating the alarms and controls for the treatment system with those for the ballast pumping system to operate from all control panels is highly necessary.
8	Are consumables, spares, and servicing support readily available?	The spares, consumables, and servicing support must be available in all the areas where the ships are navigating to keep the system operational.
9	Are seafarers adequately trained?	Training for seafarers regarding operating and maintaining the system as well as health and safety aspects such as chemical handling must be ensured.
10	How might the system affect tank structure and coatings?	Shipping companies should get assurance from the manufacturer that tanks will not be adversely affected (corrosion or coating degeneration).

In Vietnam, there is currently a TLC-BWM system developed by Thao Linh Development Maritime Technology Company Limited and Vietnam Maritime University using filtration technology combined with UV treatment with many strengths such as fully automatic processing, no need to store hazardous chemicals on board, small installation area and environmentally friendly. This system has now been "type approved" by the VR (see Figure 11) with capacities of 50, 100, 150, 200, 250, and 500 cubic meters per hour, and it has also submitted a report to IMO at the MEPC 75th meeting. This system is produced domestically at a reasonable price. It is easy for survey and installation for the Vietnamese fleet, so shipping enterprises can consider and compare the suitability with their ships to proceed with the installation.

Certificate No. **00437/20CN01.TA**

VIETNAM REGISTER

TYPE APPROVAL CERTIFICATE OF BALLAST WATER MANAGEMENT SYSTEM

This is to certify that the ballast water management system listed below has been examined and tested in accordance with the requirements of the specifications contained in the Code for Approval of Ballast Water Management Systems (resolution MEPC.300(72)) adopted on 13 April 2018; National Technical Regulation On the Control and Management of Ship's Ballast Water and Sediments (QCVN 99:2017/BGTVT). This certificate is valid only for the ballast water management system referred to below.

Name of ballast water management system: TLC-BWM

under type and model designation: TLC-BWM 50, 100, 150, 200, 250, 400, 500;
TLC-BWM 50Ex, 100Ex, 150Ex, 200Ex, 250Ex, 400Ex, 500Ex;

and incorporating:

Ballast water management system manufactured by: Thao Linh Development Maritime Technology Co.,Ltd.

to equipment/assembly drawing No TLC50W, 100W, 150W, 200W, 250W, 400W, 500W; TLC50W-Ex, 100W-Ex, 150W-Ex, 200W-Ex, 250W-Ex, 400W-Ex, 500W-Ex; date. 02 August, 2020

UV Disinfection System manufactured by: Thao Linh Development Maritime Technology Co.,Ltd.

To components drawing No TLC50U, 100U, 150U, 200U, 250U, 400U, 500U; TLC50U-Ex, 100U-Ex, 150U-Ex, 200U-Ex, 250U-Ex, 400U-Ex, 500U-Ex; date. 02 August, 2020

Filtration system manufactured by: Beijing Zhongyuantong Science And Technology Co.,Ltd.

To components drawing No TLC50F, 100F, 150F, 200F, 250F, 400F, 500F; TLC50F-Ex, 100F-Ex, 150F-Ex, 200F-Ex, 250F-Ex, 400F-Ex, 500F-Ex date. 02 August, 2020

VR Approval No.: 00437/20CN01 date. 10 September, 2020

Treatment rated capacity: 50 to 500 m^3/h

A copy of this Type Approval Certificate should be carried on board vessels fitted with this ballast water management system at all times. A reference to the test protocol and a copy of the test results should be available for inspection on board the vessel. If the Type Approval Certificate is issued based on approval by another Administration, reference to that Type Approval Certificate shall be made.

Limiting Conditions imposed and operating parameters are described in the appendix to this document.

This Certificate is valid until: 10 September, 2025

Issued at: HANOI, VIETNAM

Date: 10 September, 2020

VIETNAM REGISTER

Nguyễn Vũ Hải

Vice General Director

Note: This certificate consist of 16 pages, including the appendix and summary of the original test result.

VRCN: 0176371

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Figure 11: Type Approval Certificate of TLC-BWM

Source: VR

VI.4 Conclusion

Based on the identified challenges and current situation in Vietnam, this Chapter proposes several recommendations for the government, maritime authority, and shipping businesses.

Firstly, the government needs to pay more attention to environmental protection, including the issue of IAS from ballast water. In addition, it is crucial that a National Ballast Water Management Strategy should be developed, the completion of relevant legal instruments promoted, and effective enforcement of the regulations insured.

Secondly, the maritime authority should promote the dissemination of legal instruments related to the BWM Convention, improve the quality of human resources, and coordinate with relevant authorities to accelerate the accession to the Convention.

Thirdly, shipping businesses need to be aware of their responsibilities in protecting the marine environment, including compliance with the provisions of the BWM Convention. It is essential that the fleet should be restructured and reasonable form of operation should be chosen. In addition, businesses should consider using the domestically developed BWTS system with low cost and suitable for their ships.

Finally, joint action from the government, maritime authority, to shipping businesses is at the core. The early overcoming of difficulties and joining the BWM Convention will be a premise for the sustainable development of Vietnam's shipping industry and the protection of the marine environment in the future.

CHAPTER VII: RECOMMENDATION TO THE SUITABLE ROADMAP IN THE NEXT STEPS OF ACCESSION OF THE CONVENTION

Based on the analysis in the study, the achieved and incomplete results are summarized in the table of Section VII.1; as well as the impact of the Covid-19 Pandemic, the author would like to propose a roadmap for the following essential and practical steps in Vietnam's accession to the BWM Convention (see Figure 12).

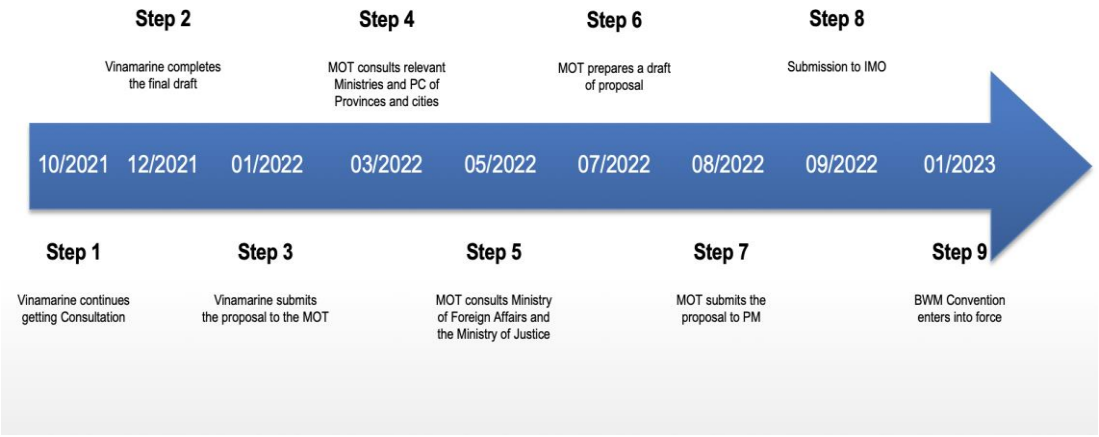

Figure 12: Roadmap for the next steps of accession of the BWM Convention

Source: Author

- Step 1: VINAMARINE continues sending requests and consulting with stakeholders on the draft proposal to join the BWM Convention until October 2021.

- Step 2: From October to December 2021, VINAMARINE analyzes and considers comments, completes the final draft of the proposed accession to the BWM Convention, and holds a meeting with stakeholders to get comments and agree on the content of the final draft.

- Step 3: In January 2022, VINAMARINE submits the proposal on the accession to the BWM Convention to the MOT.

- Step 4: From January to March 2022, the MOT will consult relevant Ministries and People's Committees of provinces and cities on the proposal to join the BWM Convention.

- Step 5: From March to May 2022, the MOT will consult the appraisal from the Ministry of Foreign Affairs and the Ministry of Justice on the Convention's consistency with other laws of Vietnam and international treaties and conventions.

- Step 6: From May to July 2022, the MOT prepares a draft proposal to join the BWM Convention and sends it to stakeholders for consideration and comments.

- Step 7: In August 2022, the MOT completes the final draft proposal and submits it to the Prime Minister of Vietnam for ratification.

- Step 8: In September 2022, the Prime Minister of Vietnam approves the proposal to join the BWM Convention and submits to IMO for accession to the BWM Convention.

- Step 9: At the beginning of 2023, the BWM Convention will come into force in Vietnam (after three months from the date of submission to IMO).

CHAPTER VIII: CONCLUSION

Although the implementation of the BWM Convention has brought significant results in responding to the IAS through ballast water on a global scale, the Convention has also brought many difficulties and challenges, especially for developing countries with limited capacities such as Vietnam.

This study showed the need to join the BWM Convention for the sustainable development of the shipping industry and promoting the protection of marine resources and the environment in Vietnam. In addition, the study also summarized and analyzed the challenges for the government, maritime authorities, shipowners, shipping enterprises, and seafarers in Vietnam. Thereby proposing appropriate recommendations to help those stakeholders overcome the initial difficult period in implementing the Convention and maintaining the international shipping industry in Vietnam. Furthermore, the study summarized the Vietnamese efforts to accelerate the accession and effective implementation of the Convention. Finally, based on the finished and unfinished results and assessing the impact of the current Covid-19 pandemic, the study has made recommendations on the practical roadmap for the following steps to join the BWM Convention in Vietnam.

It is expected that Vietnam will join the BWM Convention by 2023 and officially become a party to the BWM Convention. It is expected that the legal system will be completed and initial challenges and difficulties overcome.

However, there are still some aspects that the research has not mentioned, which are difficulties and obstacles for port enterprises, BWTS inventors, environmental management agencies, and coastal provinces. The author hopes that further studies will complete these aspects to contribute to the implementation of the BWM Convention, the protection of the marine environment and biodiversity, and the sustainable development of the shipping industry in Vietnam.

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APPENDIX

Summary of legal documents in Vietnam regarding environmental protection, including the maritime environment and the BWM Convention

1. Resolution No. 36-NQ/TW dated 22 October 2018 of the 8th Conference of the 12th Party Central Committee on the Strategy for sustainable development of the marine economy to 2030, with a vision to 2045.

This Resolution underlines the importance of sustainable marine economic development based on a green growth. Specifically, it is crucial to strengthen the management and protection of the marine environment, to prevent, control, and minimize marine pollution and environmental incidents, and intensify cooperation with bordering countries and international organizations on conserving biodiversity and marine ecosystems. The objective of this Resolution is entirely consistent with the Chapter XII of UNCLOS on the protection and conservation of the marine environment. At the same time, significant undertakings and solutions of the Resolution, including developing policies and strategies, improving science and technology, human resources, and enhancing international cooperation in order to prevent and minimize risks to the marine environment, coastal people's health, biodiversity conservation, marine and island ecosystems from external risks, are all consistent with the BWM Convention's objectives. Moreover, the effective implementation of the BWM Convention also contributes to this Resolution's achievement. However, achieving sustainable marine economic development is not an easy task. Fundamentally, it is necessary to raise the proper awareness and coordination of ministries, agencies, domestic and international enterprises on the green economic development.

2. 2015 Law on Natural Resources and Environment of Sea and Islands

This Law provides general regulations on the management of natural resources and environmental protection of sea and islands as well as rights and obligations of agencies, organizations, and individuals in this regard. Article 45, regarding the control of environmental issues from sea activities, including biological hazards, regulates that ballast water must be treated to meet technical regulations on the environment before discharging to sea. Therefore, after Vietnam accedes to the BWM Convention, ballast water will be treated under Standards D-1 and D-2. Besides, chapters VII and VIII of this Law provide regulations on monitoring, research, and establishment of information systems, and international cooperation on sea and islands' natural resources and environment, all consistent with Article 6 of the BWM Convention. However, there are no specific regulations related to scientific and technical research on ballast water management and observation, measurement, sampling, and evaluation activities related to ballast operations of ships.

3. 2012 Law on the Sea of Vietnam

This Code is the internalization of the contents of the UNCLOS Convention suitable for Vietnam, including Parts II, IV, V, VI, VII. In particular, this Code regulates the rights and obligations of vessels when operating in Vietnamese waters regarding the conservation and protection of marine resources and environment, as well as sanctions of violations. Within Vietnamese waters, the ships must comply with national and international laws regarding preserving and protecting the marine resources and environment. Besides, when doing an operation that might cause harm to natural resources, human life and pollute the marine environment, ships are not allowed to discharge hazardous wastes into Vietnamese waters.

Significantly, the ships that violate the regulations and affect marine environmental resources will be strictly handled, and the environment must be cleaned, restored,

compensated according to law; these contents are also consistent with Article 8 of the BWM Convention on handling violations related to the protection and conservation of the environment and marine resources, including impacts from invasive species. Finally, organizations and individuals operating in Vietnamese waters are obliged to pay taxes, fees, and contributions to marine environment protection according to Vietnamese law and relevant international laws.

4. 2014 Law on Environmental Protection

This Code regulates environmental protection activities, policies, measures, and resources for environmental protection; rights and responsibilities of agencies, organizations, and individuals in environmental protection. This Code regulates in Article 50 that the dumping of waste into seas and islands must be based on the characteristics and nature of the waste and approved by the competent administrative authorities. Surprisingly, ballast water after use must be collected, stored, transported, and disposed of following waste management regulations. Although this content is not detailed and clear about ballast water that has been treated and conforms to the standards of the BWM Convention is exempt, as well as this regulation includes sediment or not, it is partly consistent with the provisions of Articles 4 and 5 of the BWM Convention. In addition, Article 156 of the Code emphasizes the priority consideration of signing and acceding to international treaties that protect the global environment, regional environment, and domestic environment and are in line with Vietnam's interests and capabilities; this will create conditions for accelerating Vietnam's accession to the BWM Convention. After joining the Convention, it will be necessary to supplement and amend several provisions to suit the Convention's content better, and at the same time, it is necessary to include a definition of ballast water in this Code.

5. 2015 Vietnam Maritime Code

This Code regulates all specific and detailed aspects regarding maritime activities in Vietnam, including marine environmental protection. Articles 11 and 113 regulate maritime inspection, the PSCOs of Local Maritime Administrations are responsible for inspecting vessels operating in Vietnam's seaports, internal waters, and territorial waters to verify compliance with the provisions of maritime law and relevant international treaties to which Vietnam is a party; this is in line with Article 9 "Inspection of Ships" of the BWM Convention. After joining the Convention, PSCOs will have a right to inspect foreign ships on the BWM Convention's regulations. Besides, Articles 105 and 128 of the Code also stipulate that ships operating in Vietnamese waters must have environmental protection equipment and plan to manage this equipment. At the same time, seaports must have plans and measures to receive and treat waste from ships under regulations. Although these regulations do not directly address the prevention of IAS from ballast water, they are pretty consistent with Articles 2, 4, 5 of the BWM Convention.

6. 2008 Law on Biodiversity

This Law provides for the conservation and sustainable development of biodiversity, rights and obligations of organizations and individuals in this regard. Essentially, this Code implements the Convention on Biological Diversity (CBD) to develop national strategies for conserving and sustainable biodiversity in Vietnam (Vietnam officially joined on November 16, 1994).

In this Law, Article 7 prohibits the import, introduction, and development of IAS into Vietnam. Besides, Section 3 of Chapter 4 stipulates the regulations on controlling IAS, requiring competent authorities to organize inspection and assessment of the possibility of invasive species from outside to take measures to prevent and control

IAS. Although this content does not detail the control of IAS from ships' ballast water and sediment, it is pretty consistent with Article 4 of the BWM Convention.

However, this Law is still not specific concerning the introduction pathways of alien species, including maritime shipping, so this content needs to be added. In addition, it is necessary to study and add regulations to promote the development of ballast water management and related standards, and develop a national policy, strategy, or program on ballast water management to prevent the impact of IAS on Vietnam's biodiversity.

7. Circular 35/2018/TT-BTNMT of Ministry of Natural Resources and Environment dated 28 December 2018 on promulgating invasive alien species determination criteria and lists

This Circular prescribes criteria for identifying invasive alien species and alien species posing invasion risk in Vietnam. In addition, this Circular also promulgates the list of invasive alien species (19 species) and the list of alien species posing invasion risk (61 species) divided by groups including microorganisms, invertebrates, fish, amphibian - reptile, birds - animals, and plants.

However, this Circular has not specified invasive pathways of the alien species (e.g., by land, ships, or aircraft). Moreover, invasive procedures and hazard indexes of each species have not been mentioned. Consequently, management agencies still face difficulties in inspecting, supervising, and handling invasive incidents for each type of invasive species. These issues need to be considered and researched in more detail to effectively control invasive species issues in Vietnam.