TOWARD A COMPREHENSIVE BALLAST WATER LEGISLATIVE AND IMPLEMENTATION REGIME: LESSONS FOR GHANA

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ABSTRACT

The unintentional introduction of harmful aquatic organisms and pathogens from one marine environment into another has harmful effects on the new marine environment, human

health and property. After a series of non-binding International Maritime Organisation Guidelines, the international community conclusively responded to the unintentional transfer of harmful aquatic organisms and pathogens through ballast water and sediment discharge with the adoption of the International Convention for the Control and Management of Ships Ballast Water and Sediments, 2004. This Convention, however, is yet to come into force. Irrespective of this fact, States Parties to relevant international conventions, including Ghana, have obligations under international law to protect the marine environment and biodiversity from pollution, including bio-pollution arising from the deleterious impact of ballast water-induced harmful aquatic organisms and pathogens. These obligations are found in binding conventions like the United Nations Convention on the Law of the Sea, 1982, and the Convention on Biological Diversity, 1992. It is argued in this study that, Ghana needs an effective ballast water management regime to help ensure some protection for its coastal and marine resources and environment. Currently, the country has neither a dedicated ballast water management legislation, nor discreet legislation whose provisions attend to the issue. Meanwhile there are a growing number of coastal and offshore economic and related industries that, increasingly, exact adverse tolls on marine living resources and the environment of the country's marine areas. Of major significance in this scenario is exploration and development of offshore oil and gas. It is argued in this work that it would be beneficial for Ghana to develop a comprehensive ballast water management legislation and effective enforcement mechanisms. Also, to ensure conformity with other jurisdictions, Ghana must ratify the International Convention for the Control and Management of Ships Ballast Water and Sediments, 2004, and internalize the requirements, standards, and practices as prescribed under the Convention. Effectively, it is argued that, Ghana must pursue a functional regional cooperation to address this common problem, viz., bio-pollution.

Keywords: ballast water, harmful aquatic organisms and pathogens, marine environment, bio-pollution

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LIST OF ABBREVIATIONS

Abidjan Convention	Convention for Co-operation in the Protection and Development of the Marine and Coastal Environment of the West and Central African Region, 1981
Abuja MoU	Memorandum of Understanding on Port State Control for West and Central African Region
ABWMR	Australian Ballast Water Management Requirements
AFC	International Convention on the Control of Harmful Anti-fouling Systems on Ships
AQIS	Australian Quarantine and Inspection Service
AAPA	Association of American Port Authorities
BCLME	Benguela Current Large Marine Ecosystem
BLG	Bulk Liquid and Gases
BWEP	Ballast Water Exchange Plan
BWM	Ballast Water Management
BWMC	International Convention for the Control and Management of Ships' Ballast Water and Sediments
BWMP	Ballast Water Management Plan
BWRB	Ballast Water Record Book
BWWG	Ballast Water Working Group
CBD	Convention on Biological Diversity
CBWCMR	Canada Ballast Water Control and Management Regulations
CCLME	Canary Current Large Marine Ecosystem
CEPA	Canadian Environment Protection Act
CMA	Canada Marine Act

CMAC	Canadian Marine Advisory Council
COP	Conference of Parties
CRC	Constitution Review Commission
CRZ	Coastal Zone Regulation
CSA	Canadian Shipping Act
CSIR	Centre for Scientific and Industrial Research
DAFF	Department of Agriculture, Forestry and Fisheries
DFO	Department of Fisheries and Oceans
ECOWAS	Economic Community of West African States
EEZ	Exclusive Economic Zone
EIA	Environmental Impact Assessment
EPA	Environmental Protection Agency
FAO	Food and Agriculture Organisation
FIA	Fisheries Impact Assessment
GCLME	Guinea Current Large Marine Ecosystem
GDP	Gross Domestic Product
GIS	Geographical Information System
GISP	Global Invasive Species Programme
GEF	Global Environment Fund
GMA	Ghana Maritime Authority
GPHA	Ghana Ports and Harbours Authority
GTA	Ghana Tourist Authority

HAOP	Harmful Aquatic Organisms and Pathogens
ICS	International Chamber of Shipping
ICZM	Integrated Coastal Zone Management
IHS	Import Health Standard
IMO	International Maritime Organisation
IPPC	International Plant Protection Convention
IUCN	World Conservation Union
L.I.	Legislative Instrument
MAF	Ministry of Agriculture and Forestry
MARPOL	International Convention for the Prevention of Pollution from Ships
MDAs	Ministries, Departments and Agencies
MEA	Multilateral Environmental Agreements
MEPC	Marine Environmental Protection Committee
MoH	Ministry of Health

Chapter 1

1.2: The Problem of Invasive Species and the Global Response

Invasive species can be defined as species that are non-native or are "alien"[1] to the ecosystem under consideration. They can be terrestrial or aquatic. Invasive species are regarded as one of the leading threats to biological diversity.[2] The introduction or presence of non-native species may lead to adverse consequences for the particular ecosystem and also impact negatively on human health. They can also have an economic impact; by, for example, affecting fisheries or requiring cost to control or eradicate the problem.[3] Research shows that biological invasions continue to grow at a worrying pace and new areas are being invaded all the time. With the growth in seaborne trade, this problem is yet to reach its peak.[4]

The spread of invasive species has become a global issue.[5] As the world continues to interact even more closely, especially in the areas of international trade, travel and the transport of goods, the transfer of invasive species is bound to increase. This, particularly, is the case of aquatic invasive species or harmful aquatic organisms and pathogens (HAOP), the topic of this study.

Invasive species are now found in

They can be introduced through aquaculture as well, i.e., the intentional import of species, or unintentionally, as a result of operational by-product.[6]

One of the primary means of unintentional transfer of marine invasive species is through ships' ballast water. Hull fouling is the second major vector for the transfer of invasive species in the marine environment.[7] Shipping accounts for over 90% of the movement of global trade. An annual estimate of 3-5 billion tonnes of ballast water is transported from one place to another and over 7,000 different kinds of species are distributed globally through the discharge of ballast water.[8] However, harmful invasion in the sea and ocean areas are often invisible at the time of

outbreak was attributed to ballast water. Peru was reported to have suffered most. Over a million people in South America were affected and more than ten thousand deaths were recorded.[13] The infamous zebramussel, which is native to the Black Sea in Eastern Europe, was introduced to the North Americas through ballast water. It fouls hard surfaces and displaces native aquatic life. The most notable effect of the zebra mussel is that it blocks waterways, pipes and irrigation ditches. Between 1989 and 2000, the United States (US) is reported to have spent between US$750 million to $1billion in the control of invasive species. Toxic algae of different types have been introduced in new places through ships' ballast water.[14] This has led to the formation of harmful algal blooms in many parts of the world resulting in oxygen depletion within the marine environment and killing marine life, fouling beaches, and adversely affecting tourism, recreation and fishing.[15]

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global issue and a threat to the environment.[23] Subsequent to the adoption of the Guidelines in

It is expected that there would be a broad ratification and subsequent domestic

ensure food safety, protecting coastal tourism and human health among other considerations. Overall, prevention of introduction remains the best solution in the management of this problem.

Ghana is party to a number of international conventions such as UNCLOS and CBD. It is important to note that Ghana, already, is bound to comply with existing international obligations under UNCLOS and CBD to protect its marine environment. Under Article 56 of UNCLOS, where a State declares Exclusive Economic Zone (EEZ), that State has jurisdiction to protect and preserve the marine environment.[33] For instance, pursuant to UNCLOS, Ghana passed the Maritime Zones (Delimitation) Act, 1986.[34] Under this law, Ghana delimited its maritime zones. This power to delimit maritime zones is in addition to the general environmental protection obligations under Part XII of UNCLOS for the protection and preservation of the marine environment. The CBD provides that State Parties shall prevent, eradicate or control alien species which threaten the ecosystem, habitat or species.[35] The CBD provides a broad range of protective measures for a coastal State to adopt in addressing threats to biological diversity.[36] However, as a member of IMO, Ghana has a duty to accede to conventions under the auspices of the IMO and should also try to implement the IMO Guidelines. The BWMC deals more with preventing the export and introduction of HAOP through ships' ballast water and sediment discharged into the marine environment. In this regard, the BWMC is primarily directed at flag States. Also, the BWMC sets limits on protective action that can be taken by coastal or port States. Ghana, therefore, has obligations under the IMO Guidelines, as well as UNCLOS and CBD address the ballast concern. As a developing country, public health issues can be a serious challenge. As noted above, ballast water has been blamed for the outbreak of diseases in some countries,[37]

A concern for invasive species is not an altogether new phenomenon to Ghana. Actions to identify and prevent invasive species on land and inland waters can be traced to the mid-1960s, largely ad hocin character and focused on specific species.[38]

Invasive species management, in general, has not been explicitly legislated.[39] However, there are provisions in pieces of legislation which have a bearing on the issue.[40] Though invasive species has received some level of national attention, this has been rather slow, piecemeal and uncoordinated.[41] As a consequence, existing legislation applicable in the management of invasive species antedates the introduction of specific species into the country and is largely inapplicable in relation to HAOP introduced by ships' ballast water and sediments.

The institutions tasked with the management of invasive species also lack the capacity to deal with the problem. No single institution has the capacity to deal with it.[42] This makes it even more imperative to address the risk associated with the spread of HAOP introduced by ships' ballast water and sediment discharge through a coordinated network of policies and legislative interventions. This would expand the focus to cover prevention as a necessary first step, and control and management of bio-invasion where there is establishment of non-native species.

In Ghana, ballast water as a pathway for the introduction of HAOP has not received the level of interest that the topic has generated internationally over the years. However, in recent

More importantly, as a coastal State, many Ghanaian communities live by the sea. In the Ghanaian case, most of these coastal communities are artisanal[53] fishing communities.[54] An estimated 4.5% of Gross Domestic Product (GDP) is realized from fishing; mainly coastal fishing.[55] Therefore, the economic impact of HAOP on the fishing industry cannot be underestimated.[56] Not only is this a challenge to fishing; it also threatens food security.[57]

Beyond fishing, coastal tourism is a key revenue generation activity for Ghana. HAOP have caused problems along the coast of Ghana for some time now. For example, algal blooms are known along the western coast of Ghana. The occurrence of algal blooms has been traced to nutrient rich lagoons in the Ivory Coast[58] bordering Ghana to the west. The origin of these blooms, as noted earlier, is from the Ivory Coast, therefore, due to its proximity to Ghana, the coastal waters of western Ghana is at the receiving end of this undesirable development.

Of recent interest is the public health impact associated with HAOP introduced ballast water. Cholera outbreak is a perennial challenge in Ghana. This situation may be aggravated should there be an outbreak attributable to ballast water, given the high population living along the coast.

Ghana has begun to respond to the threat posed by HAOP introduced through ballast water. A number of domestic interventions are been put together to address the ballast water concern. As noted earlier, Ghana has put together an NBWMS. The NBWMS spells out a number of issues and recommendations that must be considered in the development of domestic ballast water intervention. A draft Ballast Water Management Bill (draft BWM Bill or draft law) which seeks to give effect to the BWMC has been developed.[59] A water quality and biological

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baseline survey (PBBS) has been carried out at one of the two sea ports in the country.[60] The aggregate of these steps are indicative of Ghana's interest and developing response to the concern. Also, Ghana has indicated its intention to integrate its domestic ballast water management response into a broader regional action.[61]

Therefore, on the regional front, Ghana plays a key role in the regional arrangement to address the threat of HAOP introduced through ballast water and sediment discharge. Ghana is a member of the Gulf of Guinea Current Large Marine Ecosystem (GCLME). The GCLME has adopted a regional strategic plan (SAP) for ballast water management. The objective of the SAP is to provide a regional framework to facilitate implementation of the BWMC.[62] There have also been training sessions for officials in different capacities working on ballast water related issues drawn from across the region and Ghana has participated in these training programmes.[63]

The question that needs to be answered is how does Ghana, a coastal State develop a comprehensive response to this issue bearing in mind its international and regional obligations as provided for in conventions and treaties it has ratified, or may ratify in conjunction with the BWMC. Also, how do all of these fit into a domestic approach to effective implementation of a successful ballast water management regime? Another issue to which due consideration must be given is the impact of ballast water management on international trade. As maritime trade continues to grow in Ghana, along with a corresponding rise in transit trade, there is a need to balance economic growth and environmental regulation.

The benefit of ratification of the BWMC for Ghana is that it would create conformity, certainty, predictability and uniformity in the application of rules for ships flying under Ghana's authority, and also ships calling at its ports. Also, when the BWMC finally comes into force, the ratification of the BWMC would lead to the adoption of comparable standards in ballast water

[60] Water Quality & Biological Baseline Survey of the Port of Tema, Ghana. Prepared(e)-uaTw -14.14 -121 (e)-uaTp-5(f)s.e

management, compliance, and any restrictions Ghana may impose in that regard. However, Ghana must not wait until ratification before it implements a ballast water management regime. This can be done under the existing IMO Guidelines.[64] This point would be elaborated upon in subsequent chapters. These questions constitute the subject of this study.

Under law, the GMA is tasked to pursue ratification and implementation of IMO conventions.[65] In this regard, the GMA is preparing the requisite instruments for ratification. In line with this mandate, the GMA is working on the draft BWM Bill alongside these efforts aimed at Ghana's ratification of the BWMC. Also, the growing awareness and public interest with

Ghana’s readiness to protect its marine environment from HAOP and prevent the wider effects of the risks associated with HAOP introduced through ballast water and other ship-related vectors. The study examines the reach of policy and legislative interventions to address HAOP introduced into the marine environment in the light of Ghana’s international treaty obligations. Though the BWMC is primarily a flag State convention, it contains some provisions applicable to port and coastal States. Ratification of the BWMC, would, therefore, avail Ghana of such provisions, such as inspection of ballast water certificates on foreign flag ships. Therefore, it is in Ghana’s interest to ratify the BWMC so that th

is an understanding that these systems may not be effective when put to use.[72] In the light of these foreseeable challenges, mid-ocean exchange of ballast water may continue to be the only effective treatment method for the time being. This process is also not without safety concerns. Thus, Ghana may as well provide under national law, regulations for mid-ocean exchange by ships entering its maritime jurisdiction, as well as other ballast water management measures.

Ghana shares common coastal characteristics with its neighbours, some of whom have ratified the BWMC.[73] The West African coast is fragmented with many countries sharing adjacent coastal waters. It is necessary that ballast water management policies are harmonized across the region to achieve the best results possible for a common concern. This is critical for the maintenance of the integrity of coastal waters of the countries within the Gulf of Guinea. The study will provide an overview of the current regional arrangements to ascertain the effectiveness of a regional process to combat HAOP.

This study is organized under five chapters, including the first chapter, the present introductory chapter.

The second chapter discusses the response to HAOP as a global concern. It examines the pre-BWMC era. Prior to the adoption of the BWMC, HAOP control and management had featured prominently in international discussions and negotiations, be it marine environment, fisheries, public health or biodiversity conservation. The chapter examines the characteristics of HAOP introduced through ships' ballast water and how various international instruments have addressed it. Key among the global response to HAOP has been UNCLOS and CBD. They have looked at HAOP broadly as a threat to the environment. Also the Rio Declaration and Agenda 21 noted this as a problem. In the 1995 Food and AgballavTJ0.8Tj-7(,20.065 0 Tdwo0idGR globaultTd(ted gh 3ey

to biodiversity conservation as well.[75] The chapter further considers the initial attempts that antedate the BWMC regarding control of the spread of HAOP and the subsequent adoption of the BWMC. The chapter further examines key provisions of the BWMC and the obligations it places on both flag States and port/coastal States. Also, some constraints and what port or coastal States can do are of particular interest in this study, especially regarding the range of concerns that nations may take into account in implementation be it legal or operational. For example, the activities a coastal State may legislate in its EEZ, under UNCLOS. This chapter concludes by highlighting the implications and gaps in the BWMC which must be considered by State Parties and countries intending to become Party to the BWMC.

Chapter 3 is a comparative analysis of national practices in Canada and India, representing both developed and developing economies' perspective. Canada is party to the BWMC while India is not. The study examines the activities undertaken in the respective countries regarding implementation of ballast water management regulation. The chapter examines how implementation of the BWMC has been carried in Canada Also, the chapter examines how India, though not a party to the BWMC has approached ballast water management. The chapter discusses the challenges regarding implementation of the BWMC at national level. The chapter also examines the constituent elements of an effective ballast water management with focus on how the elements should be addressed by a State considering protecting its marine environment among other related0.0005 Tcs a comp

chapter examines the gaps in the strategy and draft legislation. The chapter discusses a range of issues that must be addressed in the attempt to develop a durable national framework relative to ballast water management and HAOP.

The chapter further examines need to develop comprehensive invasive species management which recognizes the potential risk of HAOP introduced through ships' ballast water and sediment discharge. The chapter also examines existing legislation that provide for the control of HAOP introduced through ballast water in Ghana to ascertain its adequacy. Furthermore, it considers the institutional framework for the regulation of invasive species. This examination is necessary to determine whether they are properly structured to carry out their obligations in respect of invasive species in general and HAOP introduced through ship ballast water and sediment discharge.

The regulatory and institutional framework will then be examined in the light of the standards introduced by the BWMC. This analysis is necessary since it would shed light on how Ghana can raise itself to the international standards legislatively and institutionally in view of the need for implementation. The efficacy of the Ghanaian regime partly depends on regional initiatives. So, the chapter looks at both aspects; national and regional perspectives. In this regard, the chapter examines the likelihood of a harmonized regional ballast water management regime.

Chapter 5 is the findings, recommendations and conclusion. To conclude, the study makes recommendations along the following lines.[76] The best approach to addressing the potential harmful effects of ballast water is to prevent or minimize the incidence of HAOP being introduced into the marine environment, and beyond. However, this would continue to be an aspiration if there is no comprehensive effort at dealing with invasive species whether occurring in terrestrial spaces or the aquatic environment. In that regard, the control of HAOP introduced by ballast water and sediment discharge should be considered as a component of a wider

[76] West and Central Africa Regional Strategic Action Plan (SAP) to Minimize the Transfer of Harmful Aquatic Organisms and Pathogens in Ships' Ballast Water Adopted at the 2nd GCLME Regional Workshop on Ballast Water Control and Management Abidjan, Ivory Coast, 09 July – 10 July 2009. Available at: http://www.cpps-int.org/plandeaccion/segunda%20reunion%20globallast/Regional%20strategic%20action%20plan%20Abidjan.pdf. (Retrieved: July 29, 2012).

problem which requires comprehensive invasive species strategy. Also, it is important that Ghana takes action according to its existing international obligations to provide for control measures regarding regulation the ballast water and sediment discharge, irrespective of ratification of the BWMC or not.

Again, cross-institutional collaboration is necessary for the uniform application of rules relating to invasive species management, including HAOP introduced through ballast water.

Chapter 2 – Ballast Water Management: The International Regime

2:1. Introduction

Chapter 1 sheds light on the nature of the problem and the risks associated with HAOP introduced by ballast water, and also outlined the objectives of this study.

This chapter outlines the international regime for the management of HAOP introduced through ballast water. The focus here is on both general international environmental instruments like United Nations Convention on the Law of the Sea, 1982 (UNCLOS)[1] and Convention on Biological Diversity, 1992 (CBD),[2] and general declarations like the Rio Declaration, Agenda 21, and more recently, Rio+20[3] and the Ocean Compact,[4] the BWMC and its predecessor Resolutions adopted under the auspices of the IMO. These instruments outline the rights and obligations of States regarding the steps to take to protect and preserve the marine environment, biological diversity and human health. Some of these instruments are conventions binding on Parties whilst others are guidelines of general application. The international framework is considered next.

2.2: The International Regime Relating To HAOP

A number of international instruments "authorize or restrain the ability of a state to regulate"[5] the introduction of harmful aquatic organisms and pathogens (HAOP) through ballast water. Notable among these are UNCLOS and CBD. These instruments are binding on States

[1] There are 164 State Parties to UNCLOS. Ghana ratified UNCLOS on June 07, 1983. Available at: http://www.un.org/Depts/los/reference_files/chronological_lists_of_ratifications.htm. (Retrieved: October 25, 2012).

[2] There are 193 Parties to the CBD. Ghana became a Party on August 29, 1994. Available at: http://www.cbd.int/convention/parties/list/. (October 25, 2012).

[3] The Future We Want. 2012. A/66/L.56 annexed to A.CONF.216/16. Available at: http://www.uncsd2012.org/content/documents/814UNCSD%20REPORT%20final%20revs.pdf. (Retrieved: September 12, 2012).

[4] Press Release – "Healthy Oceans for Prosperity—An Initiative of the Secretary-General". Available at: http://www.un.org/wcm/content/site/sg/home/highlights/detail_2012-09-26_oceans_initiative (Retrieved: October 25, 2012).

[5] Churchill, R. R. and Lowe, A. V. 1999. The Law of the Sea. Manchester University Press. Manchester, UK. p. 10.

that are Parties. There are also non-binding instruments such as the Rio Declaration Agenda 21, Rio+20 and the Oceans Compact. This section considers these instruments and the extent to which they provide a framework for the prevention, control and management of HAOP.

2.2.1: United Nations Convention on the Law of the Sea, 1982

UNCLOS, an international instrument of general application with regards to the oceans, was adopted in 1982 after a decade of negotiation. It finally came into force in 1994.[6] UNCLOS comprehensively addresses most ocean-related issues including the regime for the study, protection, and preservation of the marine environment.[7] The rights and obligations of State Parties in relation to the preservation and protection of the marine environment are provided under Part XII of UNCLOS,[8] however, other provisions of UNCLOS, to some extent, relate to the marine environment, such as fisheries and natural resources.

In response to the growing problem of invasive species, UNCLOS provides the framework for State action in response to both intentional and unintentional transfer of HAOP into the marine environment through ballast water and sediment discharge.[9] Under Article 192, States are under an obligation to protect and preserve the marine environment.[10] This obligation to 'protect and preserve' is broad enough to encompass all forms of pollution including bio-pollution[11] occurring within the marine space. The question of HAOP being considered as marine pollution has not gone without debate. Marine pollution as defined by UNCLOS in Article 1(4) is –

> 1. For the purposes of this Convention:
> (4) pollution of the marine environment" means the introduction by man, directly or indirectly, of substances or energy into the marine environment, including estuaries, which

[6] Moira McConnell, Globallast Legislative Review – Final Report (IMO: London, 2002), at 19.
[7] UNCLOS, paragraph 4 of the Preamble. Available at: http://www.un.org/depts/los/convention_agreements/texts/unclos/preamble.htm. (Retrieved September 14, 2012).
[8] Id, art. 192 – 237. This Part is titled "PROTECTION AND PRESERVATION OF THE MARINE ENVIRONMENT".
[9] McConnell, Globallast Legislative Review, supra note 6, at 19.
[10] UNCLOS, supra note 7, art. 192.
[11] Maria Helen Fonseca de Souza Rolim, The International Law on Ballast Water: Preventing Biopollution (Leiden, Boston: Martinus Nijhoff Publishers, 2008), at 1. Rolim describes aquatic invasive species or harmful aquatic organisms and pathogens (HAOP) as biological pollution or simply bio-pollution. In this study, the preferred terminology is HAOP.

> results or is likely to result in such deleterious effects as harm to living resources and marine life, hazards to human health, hindrance to marine activities, including fishing and other legitimate uses of the sea, impairment of quality for use of sea water and reduction of amenities. (Italics for emphasis.)

This definition has been adopted by many States.[12]

Indeed, UNCLOS specifically provides obligations relating to species transfer under Article 196 which provides that –

> **Use of technologies or introduction of alien or new species**
>
> 1. States shall take all measures necessary to prevent, reduce and control pollution of the marine environment resulting from the use of technologies under their jurisdiction or control, or 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 thereto (Italics for emphasis).
>
> 2. This article does not affect the application of this Convention regarding the prevention, reduction and control of pollution of the marine environment.

As McConnell notes, the express mention of 'new species' in Article 196(1) is an admission that the obligation to protect the marine environment is not "limited to identified pests or harmful organisms but also includes the broader issue of the introduction of non-indigenous or alien species that may cause significant changes in a marine ecosystem."[13] Therefore, the subject of Article 196(1) can also be said to fall "within the definition of marine pollution."[14] Thus, there is a general obligation on all ratifying States to take action and prevent intentional or accidental introduction of HAOP. As Rolim notes, the introduction of HAOP is a form of pollution, viz., bio-pollution, to which UNCLOS is applicable.[15]

The next issue that arises under UNCLOS is the apportionment of responsibility for the protection and preservation of the marine environment. The overriding objective is set out in Article 194. This provision does not make a distinction between flag States and coastal

UNCLOS also obliges States to develop international rules and standards, as well as recommend practices and procedures for the protection and preservation of the marine environment, and the adoption of international regulations on ship source pollution through collaboration.[23] The development of these standards must be based on scientific studies and research.[24] Though this is a responsibility for both flag and coastal States, it pertains more to flag than coastal States.

2.2.1.2: Coastal or Port State[25] Responsibility

A coastal State also has an obligation to protect the marine environment of its sovereign waters, or waters over which it exercises some level of jurisdiction.[26] The level of control that can be exercised is determined by the delimitation of maritime zones as provided under UNCLOS,[27] *viz.*, the inland waters,[28] territorial sea,[29] contiguous zone,[30] and the exclusive economic zone (EEZ).[31] UNCLOS does not address the scope of coastal State jurisdiction in its internal waters. The rule has been that, coastal States enjoy the same rights in internal waters under its jurisdiction as they do on land.[32] Subject to UNCLOS, foreign ships enjoy the right of innocent passage through the territorial sea of a coastal State.[33] This right is subject to the exceptions in provided in UNCLOS.[34] In this regard, coastal States have the power to regulate ships entering their ports but this power must not be exercised in a manner that restricts the right of innocent passage in its territorial sea.[35]

A coastal State may also pass laws regulating passage through its territorial sea, in relation to the protection of its fishery resources and the marine environment,[36] but, these laws

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[23] UNCLOS *supra* note 7, art. 197.
[24] *Id*, arts. 201 – 202.
[25] McConnell, *Globallast Legislative Review*, *supra* note 6, at 13. Most of the issues that relate to port States also affect coastal States. Therefore, unless expressly stated, the terms are used interchangeable in this study.
[26] *Id*, at 23.
[27] *Id*.
[28] UNCLOS, *supra* note 7, art. 8.
[29] *Id*, arts. 3 – 4.
[30] *Id*, art. 33.
[31] *Id*, Part V.
[32] McConnell, *Globallast Legislative Review*, *supra* note 6, at 24.
[33] UNCLOS, *supra* note 3, arts. 17 – 19.
[34] *Id*, art. 24.
[35] *Id*, arts. 24 – 25.
[36] *Id*, art. 21(1) (d) – (f).

s.[40]

condition of the vessel and the records do not correspond substantially, or the content of the records neither confirm nor negate the violation under investigation.[42]

With regards to the contiguous zone, not all States claim it, and it falls within the rules applicable to the EEZ, which laws include the application of sanitary laws by coastal States.[43]

The EEZ covers a distance of 200 nautical miles from the baselines.[44] Within this space, a State may exercise exclusive or sovereign rights and obligations for the exploitation of natural resources.[45] It also has an obligation to carry protect and preserve the marine environment, with respect to foreign ships.[46] A State, subject to the agreement of IMO, may declare specially protected areas to which it can apply marine pollution laws. This right is subject to the right of other States to the use of the EEZ as provided under UNCLOS.[47] Therefore, States that declare EEZ under UNCLOS are under a duty to protect the marine environment from pollution in any form.

2.2.1.3: Summary of UNCLOS and relationship to HAOP

As already noted, UNLCOS does provide broadly for the protection of the marine environment. According to Rolim, HAOP introduced into another marine environment is considered bio-pollution.[48at]

hazards to the marine space would continue to emerge and States must anticipate these challenges and prepare to deal with these hazards. Therefore, Part XII permits necessary adjustment.[51] This may well account for UNCLOS not providing specific actions to be taken to prevent the introduction of HAOP into the marine environment, or any mitigation measures for that matter, since it envisages States reading their responsibilities under UNCLOS in tandem with other complementary international conventions like CBD and the BWMC. Also, this may be due to the fact that UNCLOS is an instrument that provides a general framework for the use and protection of the marine environment. Therefore, it may not provide for the finer details of measures to take in furtherance of the protection obligations provided under its provisions. It may also be that UNCLOS envisaged IMO to deal with the specifics, thus the development of IMO guidelines and subsequently the BWMC.[52] The question that is left to be answered is how ready and willing a State is in using its legislative powers to achieve its environmental protection objectives.[53]

However, before the adoption of the BWMC, other international conventions of significance also considered the topic of protecting ecosystems within the broad framework of biological diversity. These developments have largely reflected the objectives of UNCLOS and served as a continuum of efforts directed at global environment protection. Prominent in this regard is CBD.[54] The relevant provisions of CBD are considered in some detail next.

2.2.2: Convention on Biological Diversity, 1992

CBD is also an international framework instrument of general application for the protection and preservation of biological diversity. It was adopted in 1992 and came into force in 1993. Presently, there are 193 Parties to CBD.[55] It is acknowledged under CBD that, "biological

[51] Ibid, at 169.
[52] Sabitiyu Abodese Lawal,

diversity is a global asset of tremendous value to present and future generations."[56] CBD defines biological diversity as –

> the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems[57] (Italics for emphasis).

The reference to 'marine and other aquatic ecosystems' in this definition clearly implies oceans are also covered. The driving force for the adoption of CBD was the global commitment

> Subject to the rights of other States, and except as otherwise expressly provided in this Convention, the provisions of this Convention apply, in relation to each Contracting Party:
>
> (a) In the case of components of biological diversity, in areas within the limits of its national jurisdiction; and
>
> (b) In the case of processes and activities, regardless of where their effects occur, carried out under its jurisdiction or control, within the area of its national jurisdiction or beyond the limits of national jurisdiction.[64]

As noted above, CBD, like UNCLOS, is primarily general in character and does not indicate specific implementing regimes for the control of invasive species. This is left entirely to the Parties to initiate their own domestic or regional activities and initiatives to implement the provisions of CBD. Not too long after the CBD came into force, the marine ecosystem was the subject of a Ministerial Declaration.[65] This was Decision II/10 of the Conference of Parties (COP) to the CBD held in Jakarta, Indonesia.[66] Paragraph IV of Annex 1 to Decision II/10 encouraged Parties to use integrated marine and coastal frameworks to address human impacts on marine and coastal biological diversity and promote its conservation and sustainable use. The same paragraph also called on Parties to establish legislative and institutional arrangements to aid conservation efforts.[67]

A key feature of CBD is its call for cooperation among Parties.[68] Cooperation may be bilateral or multilateral, either regional or global. It obliges Parties to join with others on matters of mutual interest for the conservation and sustainable use of biological diversity. This is very important for the effective control of HAOP due to the fact that the oceans are not stagnant pools of water and HAOP is no respecter of boundaries. Directly related to the obligation to cooperate is the need to conduct impact assessments.[69] This calls for the institutionalization of impact

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[63] McConnell, Globallast Legislative Review, *supra* note 6, at 31.
[64] CBD, *supra* note 54, art. 4.

assessments to minimize adverse impacts on the environment. Again, Parties must cooperate to conduct assessments, especially in situations where they share common boundaries.

It is evident that via its provisions, the CBD lays down the framework for action on the protection of the environment and biodiversity. But it has limitations. Article 5 provides that "[E]ach Contracting Party shall, as far as possible and as appropriate, cooperate with other Contracting Parties, directly or, where appropriate, through competent international organizations, in respect of areas beyond national jurisdiction and on other matters of mutual interest, for the conservation and sustainable use of biological diversity."[70] Also, the chapeau of Article 8 reads, "Each Contracting Party shall, as far as possible and as appropriate: ...." Article 14 has the same preface as Article 8.[71] Articles 5, 8 and 14 of the CBD contain the expression 'as far as possible'. It appears that these words create some flexibility for a Party to avoid its obligations by arguing it is not possible to take action to protect biological diversity. Despite this, it is apparent that Parties have a duty under international law to deal with the issue of alien species transfer, including HAOP, either within their jurisdictions or regarding an activity taking place under their control[72] in this case, the discharge of ballast water containing HAOP.

Typical of most international instruments, the CBD establishes a scientific body to advise the Conference of Parties (COP) on the implementation of its provisions. This body is called the Subsidiary Body on Scientific, Technical and Technological Advice (SBSTTA).[73] The SBSTTA is a multidisciplinary body which is open to all Parties to the CBD.[74] The SBSTTA acknowledged the problem of invasive alien species and recommended that Parties adopt interim guidelines implement Article 8(h) of the CBD.[75] There were 15 interim guidelines in all. Guiding Principle 11[76] requires Parties to put in place measures to address unintentional introduction of invasive alien species. These measures must include statutory and regulatory mechanisms, must assign of specific responsibilities to different institutions and agencies. It also

[70] http://www.cbd.int/convention/articles/?a=cbd-05. (Retrieved: August 31, 3012).
[71] http://www.cbd.int/convention/articles/?a=cbd-14. (Retrieved: August 31, 2012).
[72] McConnell, Globallast Legislative Review, supra note 6, at 31.
[73] CBD, supra note 54, art. 25.
[74] http://www.cbd.int/sbstta/

called for the identification of pathways for such introductions and for providing measures to minimize their impact. Obviously there would cover ballast water as well. Shipping, in particular, was identified as one of such main pathways for unintentional introduction of HAOP. This express mention of ballast water required Parties to take action on the control of HAOP introduced through ballast water once they have ratified the CBD. Also, the SBSTTA recommended case studies should be carried out detailing invasive species at both national and regional levels.[77]

The interim guidelines were subsequently adopted and endorsed by the COP at its Sixth Ordinary Meeting held in April, 2002 in The Hague, Netherlands.[78] The COP reaffirmed the recommendations of the SBSTTA, especially by stating that the effective implementation of Article 8(h) of the CBD is a priority and urged Parties to implement the Guiding Principles. The COP further called on the Global Invasive Species Programme (GISP) and IMO to assist in the control of invasive alien species. In particular, the COP called on IMO to develop a complete international instrument to address environmental damage caused by the introduction of HAOP arising from international shipping, and as a matter of urgency, take steps to reduce hull-fouling as a pathway for bio-invasion.[79] The COP also tasked international environmental organizations like the GISP to –

> [I]dentify and explore gaps and inconsistencies … in the international regulatory framework from a technical perspective of the threats of invasive alien species to biological diversity, including consideration of various pathways for the transmission of invasive alien species …[80]

The COP again urged Parties to pursue inter-sectoral cooperation at national level, including the involvement of the private sector. This was an important recognition of the role the private sector must play in addressing the problem of HAOP since the spread of HAOP is mainly a consequence of trade. Another point was that the COP encouraged regional and international cooperation to address the threat of invasive alien species.[81]

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[77] Ibid.
[78] COP 6 Decision VI/23. Available at: http://www.cbd.int/decision/cop/?id=7197. (Retrieved: September 1, 2012).
[79] Id.
[80] Id.
[81] Id.

(UNESCO).[86] This fragmentation of responsibilities across the international scene is reproduced at the regional and national levels where different institutions and agencies of state are involved in the management of invasive alien species. These agencies include natural resource management, environment, transport urban planning and agriculture. This challenge at the international level reflects in the challenges associated with the implementation of CBD at national level.[87]

2.2.2.1: Summary of CBD and relationship to HAOP

In response to this challenge, it has been suggested that irrespective of the particular charaterisation of HAOP, the broader national and international interest in transporting goods by sea as part of economic development efforts must not be overlooked. To this end, governments must consider this as a period of transition where the focus should be to integrate biodiversity concerns with those of environmental protection and bio-security.[88] Beyond UNCLOS and CBD which are binding legal instruments, there are other equally important international agreements

develop an international instrument to address shipping-related pollution, including HAOP introduced by ballast water.

2.3.4: Rio+20

The problem posed by HAOP is still a current theme in global discourse. The Report of United Nations Conference on Sustainable Development (UNCSD) (Rio+20) held in June 2012 in Rio de Janeiro, Brazil, re-echoed this concern.[97] The documentary outcome of Rio+20 recognized HAOP as an ongoing problem. The Resolution adopted and annexed to the Report states in Paragraph 164 that –

> We note the significant threat that alien invasive species pose to marine ecosystems and resources and commit to implement measures to prevent the introduction, and manage the adverse environmental impacts, of alien invasive species, including, as appropriate, those adopted in the framework of IMO.[98]

This statement reemphasizes the relationship between CBD and other related environmental instruments and IMO-related instruments like the BWMC.

2.3.5: Oceans Compact

On the occasion of the thirti

of the oceans; protecting, recovering and sustaining the oceans' environment and natural

the IMO sought to address ballast water-mediated HAOP under a number of Guidelines adopted as Resolutions, from 1993 to 1997. Each set of Guidelines was an improvement on the former, eventually culminating in the BWMC. The Guidelines are discussed through the IMO in which they are formulated, followed by an analysis of the BWMC.

2.4.2: MEPCResolution 50(31)

The International Guidelines for Preventing the Introduction of Unwanted Aquatic Organisms and Pathogens from Ships' Ballast Water and Sediment Discharges (MEPC Resolution 50(31)) was adopted in 1991 in recognition of the potential harm that ballast water could cause in terms of injury to public health, property and the environment. [104] The Guidelines called for international cooperation on this issue of global significance.[105]

They recognized the research findings that living organisms can survive in ballast water carried by ships for stability during voyages, and when these species are discharged into another marine environment, they could upset the existing ecological balance and introduce disease-causing viruses and bacteria.[106]

The Guidelines, as matter-of-fact, were primarily flag State requirements. Despite the potential risks associated with ballast water and sediment discharge, the Guidelines recognized the safety role that ballast water plays in ships; ensuring balance during voyage.

The Guidelines duly acknowledged the right of States to adopt procedures to protect their waters from the effects of HAOP introduced through ballast water.[107] The Guideline recognized the exchange of ballast water in deep ocean areas or deep seas as an effective way of limiting the introduction of HAOP in coastal waters. However, the safety of life and ship should be considered when undertaking open sea exchange.[108] Member States of the IMO who took action within their respective jurisdictions pursuant to the Guidelines were to notify the IMO of their

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specific requirements and standards regarding ballast water discharge. Port Administrations and shipping organizations were also to provide adequate information on ballast water and sediment discharge to avoid unnecessary delays for ships. In effect, every maritime jurisdiction was at liberty to adopt its own measures and there was no harmonization or attempt at unification of rules and standards.

The requirement for ballast water control forms was discretionary.[109] In general, there was no obligation on flag States to insist on compliance by ships since the Guidelines were not mandatory but a port State could require ballast water management from ships calling at its ports.[110]

Again, the Guidelines called for the use of shore reception facilities for the treatment of discharged ballast water. In this regard, it was required of Member States to adopt environmentally acceptable treatment procedures. However, there was no indication as to what these acceptable treatment measures were. Indeed, the Guidelines acknowledged this problem and called for further research among Member States into treatment systems and procedures.[111] Also, the Guidelines called on classification societies to include ballast water and sediment discharge procedures in their requirements.[112]

In essence, the Guidelines called for the application of ballast water and sediment procedures to reduce HAOP. The most effective method for managing ballast water was open sea exchange. The Guidelines became the starting point for a process that would span almost 14 years to leading to the adoption of the BWMC. IMO, in the meantime, expanded MEPC Resolution 50(31) into Resolution A.774(18).

[109] Ibid, at 9.

2.4.4: IMO Resolution A.868(20)

The Guidelines for the Control and Management of Ships' Ballast Water to Minimize the Transfer of Harmful Aquatic Organisms and Pathogens was adopted in 1997.[117] It was a marked improvement on the 1991 and 1993 Resolutions.[118] One of the substantial improvements, as noted by McConnell, is the introduction of a risk minimization management approach[119], perhaps in recognition of that all that could be done is minimize risks rather than prevent it, since prevention was almost impossible. This was reflected even in the title of the Guidelines.[120] The Guidelines also provided for the adoption of precaution[121] as a way of reducing or minimizing the risk of uptake or discharge of HAOP.[122] For port States, the risk management approach places a responsibility on the ports to take steps to ensure ships are at low risk for transfer of HAOP, while flag States are required to provide for procedures to reduce risk, and provide information to port States.[123]

In effect, the Guidelines provided for ships and flag States, on one hand, and for port or coastal State responsibility, on the other.[124] For flag States, the Guidelines required ships flying their flags to have a Ballast Water Management Plan (BWMP). For port or coastal States, the Guidelines required they put in place reception facilities, alternate exchange zones and contingency arrangements at their ports. Also, port States were entitled to adopt national legislation to aid compliance and enforcement of ballast water and sediment management regulations within their jurisdictions.[125]

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[117] Available at: http://globallast.imo.org/868%20english.pdf. (Retrieved: September 3, 2012).
[118] Moira L. McConnell, 'Ballast & Biosecurity: The Legal, Economic and Safety Implications of the Developing International Regime to Prevent the Spread of Harmful Aquatic Organisms and Pathogens in Ships' Ballast Water', *supra* note 12, at 240.
[119] Id.
[120] McConnell, *Globallast Legislative Review*, *supra* note 6, at 11.
[121] Id, at 12 – 13.
[122] McConnell, 'Ballast & Biosecurity: The Legal, Economic and Safety Implications of the Developing International Regime to Prevent the Spread of Harmful Aquatic Organisms and Pathogens in Ships' Ballast Water', *supra* note 12, at 240.
[123] Id, at 241.
[124] Id.
[125] McConnell, *Globallast Legislative Review*, *supra* note 6, at 13.

least with respect to administrative placement and adoption of regulations.[129]

As explained earlier, in connection with the law of the sea, there have been differing views on the characterisation of HAOP introduced through ballast water and sediments. In the opinion of Rolim,[130] the impact of ballast water and sediment discharge should be the basis for its characterisation, and not the source. Rolim notes that, HAOP introduced by ballast water and sediment discharge was markedly different from other forms of marine pollution such as oil pollution, hence the decision to adopt an instrument independent of MARPOL.[131] The BWMC would only come into force 12 months after ratification by 30 States, representing 35 percent of world merchant shipping tonnage.[132] As of September 11, 2012, 36 countries have ratified the BWMC. These countries are Algeria, Antigua & Barbuda, Barbados, Brazil, Canada, Cook Island, Croatia, Denmark, Egypt, France, Iran, Kenya, Kiribati, Korea, Liberia, Lebanon, Maldives, Marshall Islands, Mexico, Malaysia, Mongolia, Montenegro, Nigeria, Niue, Norway, Palau, Russia, Saint Kits and Nevis, Sierra Leone, South Africa, Spain, Sweden, Syrian Arab Republic, The Netherlands, Trinidad & Tobago and Tuvalu.[133] This represents 29.07 percent of world tonnage.[134]

2.5.2: Outline of the BWMC

The BWMC[135] recognizes the contributions of UNCLOS and CBD and other international instruments to the protection of the environment from alien species within ecosystems.[136] Its 22 Articles spell out the general obligation of Parties, and an Annex containing five sets of Regulations which sets out in depth the technical obligations that must be met in order to fulfill the general obligations.

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[129] McConnell, Globallast Legislative Review, supra note 6, at 32.
[130] Rolim, The International Law on Ballast Water: Preventing Biopollutions, supra note 11, at 53.
[131] Id.
[132] http://www.imo.org/about/conventions/listofconventions/pages/international-convention-for-the-control-and-management-of-ships'-ballast-water-and-sediments-(bwm).aspx. (Retrieved: September 21, 2012).
[133] http://www.optimarin.com/visartikkel.asp?id=977. (Retrieved: October 5, 2012).
[134] http://globallast.imo.org/index.asp?page=announcements.asp. (Retrieved: September 25, 2012). With the deposit of the instrument of ratification, Denmark became the 36th State to ratify the BWMC.
[135] IMO Doc. BMW/CONF/36, 16 February, 2004.
[136] Id, Preamble.

Like CBD, the BWMC acknowledges UNCLOS and provides that nothing in the BWMC shall prejudice the rights and obligations of Parties as provided under UNCLOS or under customary international law.[137] Clearly, the provisions of UNCLOS, CBD and the BWMC regarding HAOP are complementary.

There are also a number Ballast Water Management Guidelines.[138] These are "to facilitate global and uniform implementation"[139] of the BWMC. Between 2005 and 2008, 14 Guidelines have been developed. These Guidelines are not mandatory but provide technical guidance to assist the implementation of the BWMC.[140]

the BWMC.[154] It is important to note here that, the BWMC, as in the case of other IMO conventions, it provides for the principle of no more favourable treatment. This means that ships of a non-Party to the BWMC calling at the ports of Parties to the BWMC are not exempt from the application of the BWMC. It is envisaged that when many States ratify the BWMC, the application of this principle would impel others to also ratify since their ships would not be given a treated differently when they are within the maritime jurisdiction of Parties to the BWMC.

Also, flag States shall encourage ships flying their flags to avoid taking up water that may ntes sh the 0.0

equipment and laboratories that are easily accessible. The port State must have well-trained and qualified personnel to conduct these tests, and report back in timely fashion for a decision to be made. This means well-trained port state control (PSC) officers should be at hand to carry out inspections.[160]

It must be noted that there can only be a detailed inspection of the ship only where there is “clear grounds” for believing that the ship or its equipment does not correspond substantially with the details on the certificate, the ship’s master or crew are not familiar with the ballast water management procedures or have failed to implement these procedures.[161] If any of these grounds

2.5.6: Annex to the BWMC

As described by Puthucherril, the "most salient feature" of the BWMC is the Annex.[167] The Annex is a set of five Regulations which set out in detail the general obligations under the BWMC. These Regulations set out under these various headings –

1. Section A – General Provisions;

2. Section B – Management and Control Requirements for Ships;

3. Section C – Special Requirements in Certain Areas;

4. Section D – Standards for Ballast Water Management; and

5. Section E – Survey and Certification Requirements for Ballast Water Management.

As noted earlier, the Annex provides for the discharge of obligations with regards to ballast water and sediment discharge as provided in the Articles of the BWMC. In this regard, some of these detailed Regulations are considered. Regulation A-2 provides that the discharge of ballast water shall only be conducted in accordance with the Annex.[168] There are, however, exceptions, and these are provided for in Regulation A-3. One of the important issues in ballast water management is the safety of ship and life onboard the ship, therefore, the rules dispensed with in the event that uptake or discharge of ballast water and sediments would put the ship at risk. Also, in emergency situations or where the ship is involved in saving life at sea, the ballast water management is dispensed with.[169] Also, where there is an accidental uptake or discharge of ballast water or sediments as a result of damage to ship, ballast water management rules would not apply. This exception is not absolute. The ship must have taken all necessary precaution before and after the damage to minimize the discharge, and also that the damage did not arise from a willful reckless act done by an officer in charge of the ship.[170] Again, the also, the discharge of ballast water and sediments from a ship at the same location where it took up that ballast water is exempted from the application of the Annex. However, if the ballast water taken

up is mixed with unmanaged ballast water from a different location, then that water, then it is subject to management under the Annex.[171] Regulation B provides that all ships affected by the BWMC must have a BWMP. It also outlines in detail what the BWMP should contain. For example, it must have a BWRB, Ballast Water Exchange Plan (BWEP) and sediment management plan.[172] Also, by the end of 2016, all ships must comply with ballast water performance standards.[173] Regulation C is on special requirements in certain areas which includes warnings regarding certain areas considered unsafe for ballast water uptake.[174] Of critical importance is Regulation C-1. Under this Regulation, a Party or Parties to the BWMC may in addition to the requirements under Section B adopt additional measures to prevent, reduce or eliminate HAOP introduced through ships' ballast water and sediments. However, these additional measures must be consistent with international law.[175] In this regard, a Party intending to adopt additional measures must consult adjacent or other States that may be affected by these additional measures.[176] Regulation D provides for ballast water management systems approval.[177] Finally, Regulation E provides for survey, issuance and endorsement of ballast water management certificate.[178]

The provisions and the Annex of the BWMC are buttressed by the Guidelines which support and facilitate their implementation. The Guidelines formulated so far are considered next.

2.5.7: Ballast Water Management Guidelines

Though not legally binding, the Guidelines are very important to the BWMC and its successful implementation. To ensure a smooth transition to the new regulations, the IMO, through the MEPC has issued these Guidelines.[179] These are: Guidelines for sediment reception facilities (Guideline 1) (resolution MEPC.152(55)); Guidelines for ballast water sampling

(Guideline 2) (resolution MEPC.173(58)); Guidelines for ballast water management equivalent compliance (Guideline 3) (resolution MEPC.123(53)); Guidelines for ballast water management and development of ballast water management plans (Guideline 4) (resolution MEPC.127(53)); Guidelines for ballast water reception facilities (Guideline 5) (resolution MEPC.153(55)); Guidelines for ballast water exchange (Guideline 6) (resolution MEPC.124(53)); Guidelines for risk assessment under regulation A-4 of the BWM Convention (Guideline 7) (resolution MEPC.162(56)); Guidelines for approval of ballast water management systems (Guideline 8) (resolution MEPC.174(58)); Procedure for approval of ballast water management systems that make use of Active Substances (Guideline 9) (resolution MEPC.169(57)); Guidelines for approval and oversight of prototype ballast water treatment technology programmes (Guideline 10) (resolution MEPC.140(54)); Guidelines for ballast water exchange design and construction standards (Guideline 11) (resolution MEPC.149(55)); Guidelines on design and construction to facilitate sediment control on ships (Guideline 12) (resolution MEPC.150(55)); Guidelines for additional measures regarding ballast water management including emergency situations (Guideline 13) (resolution MEPC.161(56)); Guidelines on designation of areas for ballast water exchange (Guideline 14) (resolution MEPC.151(55)) and Guidelines for ballast water exchange in the Antarctic treaty area (Guideline 15) (resolution MEPC.163(56))[180]

From the list, it is evident that these Guidelines are useful in a number of ways. They take into account the safety of ship, its equipment and human life onboard the ship.[181] For Parties wanting to protect their coastal environment, there are a number of Guidelines that are helpful for that purpose. Guidelines 1[182] provide for sediment reception facilities. It is directly connected the BWMC in that the MEPC notes the requirements of Article 5 of the BWMC which calls on Parties to provide adequate facilities for the reception of sediments "taking into account the Guidelines developed by the IMO." The use of the phrase, "as far as practicable" suggests it is not obligatory for Parties to provide the facility, if a Party considers itself incapable of doing so. However, when such designation is made, the Party is obliged to take steps to inform the IMO

[180] Supra note 138.
[181] Puthucherril, 'Ballast Water and Aquatic Invasive Species: A Model Law for India', supra note 127 at 400.
[182] MEPC Resolution 152(55). Available at: http://globallast.imo.org/2012/Individual%20Guidelines%20for%20reference/G1.pdf. (Retrieved: September 7, 2012).

for onward communication to other Parties. Guidelines 1 must be read together with the obligation of Parties under Article 5(1) of the BWMC which provides that Parties should take into account "the Guidelines developed by the Organization" in the fulfillment of their obligation to provide sediment reception facilities.

The procedures for sampling are contained in Article 6 of the Guidelines 2.[183] The Guidelines provide for the conduct of ballast water exchange and ballast water performance standards.[184] This must be read together with Regulation D of the Annex which is referred to

also provide for the identification of areas that are safe for the conduct of ballast water exchange.[190]

From the foregoing, it is evident that a coastal State can also draw on the BWMC to formulate rules or legislation regarding the control of HAOP, in addition to its obligations under UNCLOS and CBD.

Just like all international conventions before it, the BWMC is not without its weaknesses. Some of these are considered next.

2.5.8: Weaknesses of the BWMC

Even before it becomes operational international law, a number of shortcomings have already been identified. The greatest challenges is that the BWMC falls short of the comprehensive HAOP management and control instrument that had been envisaged by a number

then the risk of vessel fouling especially hull fouling, would be greatly increased.[194] Regrettably, the BWMC was adopted three years after without catering for vessel fouling. It is rather surprising that with all the information about the increased spread of HAOP through hull fouling by preceding conventions such as the CBD, this was not addressed under the BWMC.

Recently, the US ratified the AFC bringing the number of Parties to 61 countries, representing approximately 80.22% of gross tonnage of world merchant shipping.[195] This makes the issue even much more pressing requiring remedial action. In a study conducted in Hawaii, it was reported that more non-indigenous species were introduced by hull fouling than through ballast water.[196] This issue has caught the attention of IMO, and as recent as 2011, the MEPC put together draft Guidelines for the Control and Management of Ships' Biofouling.[197] This draft was agreed to by the Sub-Committee on Bulk Liquids and Gases (BLG). When the draft Guidelines is adopted, it would "represent the first set of international measures for minimizing the translocation of invasive aquatic species through biofouling of ships".[198] Despite the magnitude of the problem, the draft Guidelines has still not been adopted. It therefore stands to reason that the global shipping community should seriously consider measures to deal with this issue; else all the successes projected to be

rules that had existed before the adoption of the BWMC.[200] Also, it has been argued that the adoption of stringent measures would render "the BWMC irrelevant."[201] This concern is further heightened by the fact that under UNCLOS and CBD, there are pre-existing obligations for the protection and preservation of the marine environment[202] and biological diversity.[203] Therefore some States may be unwilling to ratify the BWMC since the BWMC leaves room for uneven practice among States in terms of the adoption of uniform rules and standards.[204]

Another shortcoming of the BWMC is the question of ballast water sampling. The BWMC provides that sampling of ballast water shall not lead to undue delay of ships. The practice is that in most developing countries, there is a lack of the requisite testing capacity. Where ships are delayed unduly, they are entitled to compensation. Most developing countries would not want to be caught having to pay compensation for causing delay to ships and, subsequently, risk the anger of the shipping community. Also, the BWMC does not expressly oblige Parties to have in place sampling laboratories. The real situation is that most developing States do not have the capacity to do such tests quickly.[205] As such, the absence of an express provision requiring testing laboratories, and the ever present fear of paying compensation, constitute a potential drawback for ratification by some States.[206]

The BWMC does not provide for biological surveys of ports. To ascertain the presence of HAOP in the harbour waters especially, periodic surveys must be conducted to ascertain the presence of native, cryptogenic and invasive alien species in the port environment. This obvious gap in the BWMC must be addressed with utmost urgency.

Another problem is the absence of the technology needed to achieve an enduring solution in the management and control of HAOP from ballast water and sediment discharge. There are a

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[200] Puthucherril, 'Ballast Water and Aquatic Invasive Species: A Model Law for India', supra note 127, at 403.
[201] Lawal, Ballast Water Management Convention 2004: Towards Combating Unintentional Transfer of Harmful Aquatic Organisms and Pathogens, supra note 52, at 154.
[202] UNCLOS, supra note 7, art. 196.
[203]

number of technologies that are currently under review by the IMO and some have been

damage and the costs of remediation or containment as a result of the unintentional transfer of harmful aquatic organisms and pathogens is a difficult issue."[213]

2.6: CONCLUSION

In this chapter, the evolution of the international response to HAOP introduced through ballast water and sediments were considered. From general instruments on marine environment protection, to biodiversity protection, such as UNCLOS, CBD to declaratory outcomes like Rio Declaration, Agenda21, and recently Rio+20 and the Oceans Compact, the need to protect the marine environment was stressed. Some of these instruments directly called on IMO to lead the way in combating HAOP introduced through ballast with the adoption of an international framework which focuses more on preventative measures being adopted by the shipping community and regulators alike, as well as providing for the protection of the coastal and marine environment and human health from the deleterious impact of HAOP.

IMO, through a series of voluntary Guidelines, put in place a number of measures that States can adopt individually to provide and enforce regulations within their jurisdiction to address the ballast water concern. With time, and experience from the voluntary application of

practices are to inform Ghana's domestic response, and ballast water and HAOP management within West Africa.

any State may contend with in its quest to address this problem. India, like Canada, is a large port/coastal State. It has twelve major ports and more than 187 smaller ports, with ballast water being a major contributor to unintentional species introduction in its coastal waters.[5] The choice of both Canada and India is also crucial in terms of the integrated approach to ocean management and integrated coastal zone management (ICZM) that they adopted in this regard.[6] Also, Canada has also been able to integrate its obligations under CBD into its approach on the management and control of HAOP introduced through ballast water and sediments.[7] India was one of the countries which were selected for the Globallast Legislative Review Project (Globallast Project).[8] These reviews made some recommendations which are useful from a developing country perspective. More importantly, both Canada and India developed their HAOP regulatory activities along the lines of a number of institutions including those tasked with environment protection, transport and fishing. It would be useful to consider these developments.

Australia, perhaps, has devoted more resources and conducted wide-ranging research on the issue of HAOP introduced through ballast water than any other country.[9] Drawing heavily on the Australian example, New Zealand fashioned an equally successful ballast water management regime.[10] The US has also been active in regulating ballast water discharge.[11] Though these countries are not parties to the BWMC, it t would be useful to this study to learn from their experience and adapt it for the benefit of Ghana.

The chapter concludes with a summary of the highlights of the various sections discussed under it. The summary underscores the complex mix of issues to be considered with regards to ballast water management at both the domestic and regional levels and gives some indicators as to what can be learnt from the experience of other jurisdictions.

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[5] Tony George Puthucherril, 'Ballast Water and Aquatic Invasive Species: A Model Law for India', (2008): 19 Colorado Journal of International Environmental Law & Policy 381, at 414.
[6] Canada is a leading example of a country with comprehensive ocean legislation. http://www.dfo-mpo.gc.ca/oceans/management-gestion/index-eng.htm. (Retrieved: September 9, 2012).
[7] http://www.oag-bvg.gc.ca/internet/English/att_c20050901xe07_e_14109.html. (Retrieved: September 20, 2012).
[8] McConnell, Globallast Legislative Reviews, *supra* note 4, at 47.
[9] Id, at 71.
[10] Id, at 80.
[11] Id, at 77.

3.2: Ballast Water Management in Canada and India

3.2.1: Introduction

As noted earlier, Canada was one of the earliest countries to give global prominence to the introduction of HAOP through ballast water and sediment discharge.[12] Canada had experienced the devastating effect

The Federal Government has power to enter into international agreements as well.[18]

Based on this power to make or enter into international agreements and commit to them, the Federal Government passed the Oceans Act[19] pursuant to its ratification of UNCLOS. An underlying objective of the Oceans Act is that, conservation, based on an ecosystem approach, is of fundamental importance to maintaining biological diversity and productivity in the marine environment.[20] Canada was also the first country to adopt a comprehensive legislation on oceans management. The Oceans Act represents a benchmark for ocean legislation worldwide.[21]

(a) hazards to human health;
(b) harm to living resources or marine ecosystems;
(c) damage to amenities; or
(d) interference with other legitimate uses of the sea.[28]

This definition in CEPA is similar to that provided in Article 1(4) of UNCLOS.

Another important piece of legislation relating to pollution prevention and, to a greater degree, HAOP introduction through ballast water, is the Fisheries Act.[29] Section 34 of the Act prohibits a number of items, including the discharge of a substance, deposit, or water, which can have a harmful effect on fishery resources. This can be interpreted to include ballast water and sediment discharge.

The Canada Marine Act (CMA) also provides for the efficient management of ports by port authorities.[30] It provides for the inspection of ships and the production of documents by a person in charge of a ship under such inspection.[31]

The Canada Shipping Act (CSA)[32] is the most significant and comprehensive legislation governing most aspects of shipping in Canada.[33] Under the authority of the CSA, the Canada Ballast Water Control and Management Regulations, 2011 (CBWCMR) were adopted.[34] The CBWCMR was developed by the Department of Transport (Transport Canada) and it represents Canada's domestic implementation of the BWMC. Prior to the CBWCMR, Canada went through an evolution largely based on the approach adopted beginning with voluntary action by the shipping industry, through implementation of IMO Guidelines and now the CBWCMR which creates a legally compellable regime for the control of ballast water and sediment discharge. The Shipping Federation of Canada (SFC) led an initiative to develop a ballast water exchange programme to minimize the risk of spread of HAOP.[35] This effort led to the "Voluntary

[28] S.C. 1999, c. 33. Available at: http://laws-lois.justice.gc.ca/PDF/C-15.31.pdf. (Retrieved: September 12, 2012).
[29] R.S.C., 1985, c. F-14. Available at: http://laws-lois.justice.gc.ca/PDF/F-14.pdf. (Retrieved: September 10, 2012).
[30] S.C. 1998, c. 10. Available at: http://laws-lois.justice.gc.ca/PDF/C-6.7.pdf. (Retrieved: September 10, 2012).
[31] Id, sec. 109.
[32] S.C. 2001, c. 26. Available at: http://laws-lois.justice.gc.ca/PDF/C-10.15.pdf. (Retrieved: September 10, 2012).
[33] McConnell, 'Responsive Ocean Governance: The Problem of Invasive Species in Ship's Ballast Water – A Canadian Study', supra note 17, at 464.
[34] SOR/2011-237. Available at: http://laws-lois.justice.gc.ca/PDF/SOR-2011-237.pdf. (Retrieved: September 11, 2012). The CBWCMR was made pursuant to sections 35(1) and 190 of the CSA.
[35] McConnell, Globallast Legislative Review, supra note 4, at 73.

Guidelines for the Control of Ballast Water Discharges from Ships Proceeding to the St. Lawrence River and Great Lakes (Voluntary Guidelines)."[36] The Voluntary Guidelines was region-specific in that it focused only on the Great Lakes area.[37]

Since then, there have been several developments marking a steady progress in the regulatory regime. In 2000, the Canadian Guidelines for the Control of Ballast Water Discharge from Ships in Waters under Canadian Jurisdiction replaced the Voluntary Guidelines.[38] The new Guidelines was developed by the Canadian Marine Advisory Council (CMAC), a body with broad national and local representation made up of government, the shipping industry and environmental associations, with interest in shipping and marine pollution.[39] The purpose of this new set of Guidelines was to expand the scope of application to all waters under Canada's jurisdiction and not just the Great Lakes Region as the Voluntary Guidelines had sought to do.[40] It was amended in 2001 and it incorporated the 1997 IMO Guidelines[41] and additional requirements leading to the application of the Guidelines to "all vessels entering Canada's EEZ from seaward."[42] This meant that 200 nautical miles (NM) towards land, all ships entering Canadian waters were subject to these Guidelines. This was a significant development since port authorities and allied agencies could monitor ship operations in terms of ballast water discharge within this jurisdiction, a situation that hitherto, did not exist. However, they were not considered law in Canada though they provided indirectly for sanctions.[43] The reason was that these Guidelines were not "Regulations" as characterised by the CSA so as to have legal effect.

It was not until 2006 when the Ballast Water Control and Management Regulations (Regulations) were made pursuant to the CSA. Just like the Guidelines were based on the

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[36] Ibid, at 73.
[37] Id.
[38] TP 13617. Available at: http://www.bcrock.com/reports/ballastwater_guidelines0900.pdf. (Retrieved at: September 11, 2012).
[39] McConnell, 'Responsive Ocean Governance: The Problem of Invasive Species in Ship's Ballast Water – A Canadian Study', supra note 17, at 464.
[40] http://www.tc.gc.ca/eng/marinesafety/tp-tp13617-preface-2086.htm. (Retrieved: September 11, 2012).
[41] IMO Resolution A.868(20). Guidelines for the Control and Management of Ships' Ballast Water to Minimize the Transfer of Harmful Aquatic Organisms and Pathogens. Available at: http://globallast.imo.org/868%20english.pdf. (Retrieved: September 11, 2012)
[42] McConnell, 'Responsive Ocean Governance: The Problem of Invasive Species in Ship's Ballast Water – A Canadian Study', supra note 17, at 463.
[43] McConnell, Globallast Legislative Review, supra note 4, at 74. This was in 2002, four years before the making of the Ballast Water Control and Management Regulations, 2006 under the CSA.

ballast water may be dispensed with.[51] Ships on a transoceanic voyage are to perform ballast water exchange at least 200 NM from

Canadian marine environment. It does not answer the question of export of HAOP from Canada to other jurisdictions.[62] To this end, McConnell notes that it is not ecosystem-based but rather jurisdictional. Again, although coasting trade has been recognized as a potential source of bio-invasion, the CBWCMR does not deal address this problem. Also, the use of alternate exchange zones is a harbinger of the problems that Canada may experience with HAOP in future, since they may only serve as nurturing grounds for HAOP.[63]

From the foregoing, it is evident that various pieces of legislations are implicated in the management of ballast water and HAOP, and this means no one institution can be responsible for the successful implementation of any initiative or plan to address this concern. This is considered next.

3.2.3: Overview of HAOP Institutional Framework in Canada

As noted above, shipping and navigation fall within the remit of the Federal Government.[64]

framework to minimize the risk of invasive species in Canada.[68] A number of lead federal departments were identified to spearhead the effort, and budgetary allocation was made for this purpose. These departments were Environment Canada, DFO Canada, Department of Agriculture and the Department of Natural Resources (Natural Resources Canada).[69]

With direct reference to aquatic invasive species, DFO Canada is the lead agency at the federal level. Presently, aquatic invasive species is being addressed under the "Health of the Oceans Initiatives" which was made pursuant to the Oceans Act. Environment Canada is the lead institution together with four other institutions, namely, Transport Canada, DFO, Parks Canada Agency and Indian and Northern Affairs Canada.[70] Prior to this, the aquatic invasive species aspect of the biodiversity strategy, called "A Canadian Action Plan to Address the Threat of Aquatic Invasive Species", was under the joint management of Environment Canada and DFO.[71] In relation to the management of HAOP introduced through ballast water, Environment Canada provides advice based on scientific information whilst Transport Canada is responsible for the adoption, implementation and enforcement of ballast water management regulations.[72]

Canada's activities in regulating ballast water discharge have been considered quite successful and, according to DFO, no new introductions have been attributed to ballast water discharge.[73] However, with the ban on the use of tributyltin (TBT) and other chemicals used in hull coatings to prevent fouling considered harmful under AFC, it is possible that there may be introduction by way of hull fouling, though general condition surveys are conducted for ships.[74]

Canada has also been active in regional cooperation efforts to address the invasive species problem. The need for regional cooperation is to avoid the spread of HAOP along coastlines. A trilateral agreement, "Prosperity and Security Partnership for North America", was signed by the US, Canada and Mexico. Among the objectives of this partnership is the need to

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[68] Ibid, at 19.
[69] http://www.dfo-mpo.gc.ca/oceans/management-gestion/healthyoceans-santedesoceans/who-qui-eng.htm. (Retrieved: September 13, 2012).
[70] Id.

address the spread of invasive species by identifying them and developing a strategy to reduce their environmental and economic impact across North America.[75]

Also, Canada has dedicated resources and expertise in collaborating with the US in the Great Lakes waters. Joint inspections by the US Coast Guard (USCG) and Transport Canada has ensured a high degree of success in managing the St. Lawrence Seaway and preventing further introduction of HAOP by ships through ballast water.[76] Also, the USCG and Transport Canada have a continuing programme on sampling residual water and sediments from the ballast tanks of NOBOB vessels so as to determine the success of this initiative in reducing or preventing the introduction of alien invasive species to the Great Lakes.[77] This successful collaboration is worthy of emulation within the context of regional cooperation among countries with similar challenges in regard to HAOP introduced by ship's ballast water.

Canada's ballast water management regime has not been without challenges. For example, Canada is Party to the BWMC while the US is not. As noted above, the two countries have worked together to secure the St. Lawrence Seaway against introduction of HAOP through ballast water and have been fairly successful in that regard.[78]

Another challenge is funding. Ballast water management-related agencies do not have all

3.2.4: Summary

From the foregoing, the study of Canada offers some lessons. The identification of ballast water and sediment discharge as a problem was a significant step. Subsequently, Canada adopted legislation and promulgated regulations for the management of the ballast water concern. An important feature is the involvement of stakeholders and communities whose activities are implicated. Institutional collaboration central was to

Ship-source pollution is covered under the Water (Prevention and Control of Pollution) Act, 1974, which is a law for the prevention and control of pollution in India.[88] Also, the Coast Guard Act, 1978, places a duty on officials to protect the maritime environment from pollution.[89] The Indian Ports Act, 1908,[90] the Major Ports Act,[91] and the Merchant Shipping Act, 1958[92] have provisions that address ship-source pollution.[93]

Quarantine measures are provided under the Indian Port Rules pursuant to the Indian Ports Act. These Rules are focused on human health and diseases only and do not address HAOP.[94]There is no comprehensive law dealing with the discharge and management of HAOP introduced through ballast water from ships. To this end, it was recommended that India must amend its Merchant Shipping Act to provide State obligations relating to this issue.[95] Others have suggested that India may address this issue under existing laws under three alternative points.[96] The three heads under which the issue can be addressed are:

1. From an environmental perspective (biodiversity conservation);

2. Human health concern; or

3. Ship-source pollution.

As an environmental issue, that is the State's obligation to preserve and protect biological diversity, it is suggested that the Water (Prevention and Pollution) Act may be amended to include HAOP introduction as a form of pollution.[97] Also, the Environment Protection Act, and the more recent Biological Diversity Act, 2002[98] can be amended to reflect this inclusion.[99]

As a human health concern, the quarantine laws of India can be used to regulate ballast water. For example, the Indian Port Rules can be amended to address ballast water in cases where HAOP are introduced.[100]

The third is the regulation of ballast water as ship-source pollution. Section 6 of the Indian Ports Act, to an extent, regulates the discharge of ballast water. However, this is more applicable in terms of oil in discharged ballast water. The Government of India amended its Merchant Shipping Law in 2003 with the passage of the Merchant Shipping (Amendment) Act.[101] This amendment still does not address the issue of HAOP introduced by ballast water since it treats ballast water largely as a potential source of oil pollution "rather than as an invasive species biohazard."[102]

As invasive species begin to take hold in Indian coastal waters, there has been a need for a comprehensive and overarching law that addresses the issue of ballast water. Recent studies showed the presence of non-native species in Indian waters.[103] However, like other developing countries, India has been grappling with the ba

From the foregoing, India recognizes the ballast water concern, however, it has not promulgated a comprehensive legislation to address the problem as opposed to Canada. This may be attributed to the fact that India is a developing maritime jurisdiction as opposed to Canada. However, in recent times, ballast water management has become a matter of interest in coastal protection involving an integrated management approach involving a number of institutions, similar to the Canada's approach. This is discussed next.

3.2.6: Overview of HAOP Institutional Framework in India

The Ministry of Surface Transport is responsible for the shipping subsector.[108] Through this ministry, the Government developed rules relating to ship-source pollution and its

ballast water risk assessment, development of Geographical Information Systems (GIS) on ballast water management through modelling studies to identify alternate zones for ballast water discharge in emergencies,. Also, India has begun the implementation of e-ballast reporting forms[115]. This begun in 2010 and it its success or otherwise would be evaluated at the end of 2016.[116]

Until recently, ballast water management issues had not featured prominently in ICZM approaches adopted in India. India adopted its first law on ICZM in 1991. This was known as the Coastal Regulation Zone Notification (CRZ of 1991).[117] The coverage of this law was rather limited and it was considered as largely unsuccessful.[118] Attempts to replace it with a better law did not yield any results. In 2008[119], the draft Coastal Regulation Zone Notification (draft CRZ of 2008) was considered deficient from the outset and a product of concessions by government to the pro-development lobby.[120] For example, the draft CRZ of 2008 did not provide for prevention and control of the introduction of HAOP through ballast water. As Puthucherril notes, "[T]hese were serious omissions, given that India has no comprehensive marine environmental regime."[121] However, a positive point of the draft CRZ of 2008 was that it provided for the creation of a 32-member board composed of representatives of different institutions and stakeholders to give policy advice to the Government of India on coastal zone issues.[122]

However, after two decades, the CRZ of 1991 was replaced with a more comprehensive legislation.[123] The Coastal Regulation Zone Notification of 2011[124] (CRZ of 2011) replaced the CRZ of 1991. The discharge of ballast water is prohibited under the CRZ of 1991 and other

[115] Forms available at: http://www.bwmindia.com/~ballast/node/3. (Retrieved: September 18, 2012).
[116] http://www.nio.org/index/option/com_newsdisplay/task/view/tid/4/sid/23/nid/267. (Retrieved: September 18, 2012).
[117] 20 February 1991, SO No. 114 (E). It is a subordinate legislation made under the Indian Environment Protection Act.
[118] Tony George Puthucherril, 'Operationalising Integrated Coastal Zone Management and Adapting to Sea Level Rise through Coastal Law: Where Does India Stand?', The International Journal of Marine and Coastal Law, (2011): Vol. 26, 569 at 575.
[119] Id.
[120] Id.
[121] Id, at 595 – 596.
[122] Id, at 596.
[123] Id.
[124] Available at: http://envfor.nic.in/legis/crz/crznew.html. (Retrieved: September 26, 2012)

The US adopts an invasive species control approach, primarily targeted at controlling

water management requirements are consistent with International Maritime Organisation (IMO) Guidelines for minimising the translocation of harmful aquatic species in ships' ballast water."[142] Though, it antedates the BWMC, the ABWMR is still considered to accord with the BWMC though Australia has not ratified the BWMC.[143] It is stated thus –

> The requirements are consistent with the International Maritime Organisation (IMO) Ballast Water Convention that aims to minimise the translocation of harmful aquatic species in ships' ballast water and ballast tank sediments.[144]

The ABWMR is administered by the Australian Quarantine and Inspection Service (AQIS) under the Department of Agriculture, Forestry and Fisheries (DAFF).[145] Under the ABWMR, all international ships calling at Australian ports are to manage their ballast water.[146] In this regard, ships are prohibited from discharging "high-risk" ballast water in Australian ports or waters.[147] The AQIS considers all salt water originating from ports or coastal waters beyond the territorial sea of Australia as "high-risk" capable of introducing marine pests into its coastal environment.[148] The ABWMR permits tank-to-tank transfer of high-risk ballast water, however, this must not lead to discharge.[149]

Also, the ABWMR recognized ballast water management. In this regard, full ballast water exchange is permitted. The three methods permitted under full exchange of ballast water are sequential, flow through and dilution. Exchange of ballast water must take place at least 12 NM off the coast of Australia, and far away as possible from the shore and in waters with a depth of at least 200 metres.[150] The exchange of ballast water should, however, not expose the ship, s

an occurrence.[151] Also, ships that are unable to exchange ballast water within the prescribed manner due to any reason should inform AQIS as soon as possible but before arrival at any Australian port. This is part of Quarantine Pre-Arrival Report (QPAR) and it must be done not later than 96 hours prior to the ships arrival in port.[152] The QPAR may be submitted electronically,[153] and must contain details on the ship, human health, visits to ports and waters of potential risk of introducing HAOP into Australian waters and details on ballast water management measures.[154] Ships that violate this order may not be allowed to discharge ballast water in Australian waters or prevented from entering port. The only condition for discharge of ballast water within Australian waters is a written permission from AQIS.[155] The acceptable level of ballast water discharge is "at least 95% managed water to a maximum of 5% unmanaged water in any mixture to be discharged."[156]

For ships with a good compliance history, co-regulatory agreements covering aspects of quarantine measures would be made available to them.[157] This is subject to the continuous compliance with the requirements of AQIS.[158]

The ABWMR also prohibits tank stripping of sediment discharge into Australian waters.[159] This is a promotion of the use of sediment reception facilities.[160]

A master of a ship must provide access to safe ballast water sampling points. An officer of AQIS conducting ballast water must avoid delaying ship unnecessarily.[161] The insistence on avoidance of delay is in line with the need to prevent economic and other loss occasioned by avoidable delays. For the purposes of verification of ballast water management, an officer of

[151] Supra note 144, at 3.
[152] Id, at 8.
[153] Id.
[154] ABWMR, supra note 140, at 7.
[155] Id.
[156] Id.
[157] ABWMR, supra note 140, at 8.
[158] Id.
[159] Id.
[160] McConnell, Globallast Legislative Review, supra note 4., at 72.
[161] ABWMR, supra note 140, at 8.

AQIS may conduct a verification inspection. This inspection must not exceed thirty minutes and normally takes place at the same time that a routine inspection is ongoing.[162]

Under the Quarantine Act, breaches of the requirements of quarantine measures are treated as serious offences which may lead to a conviction and imprisonment of the offender for up to 2 years.[163] This is applicable to breaches of the ABWMR.

Australia has also conducted pilot schemes on the treatment of ballast water. It was recommended that Australia gets more involved in the testing and approval of technologies pending the introduction of such treatment sy

New Zealand places a great deal of emphasis on inter-agency collaboration and response to the problem of invasive species, hence the establishment of the Biosecurity Council.[176] Beyond governmental representation, it includes of non-governmental representatives on the Biosecurity Council has increased stakeholder participation and evaluation of biosecurity programmes. New Zealand is recognized as one of the global leaders in HAOP management, succeeding largely based on increased accountability of institutions through giving them clearly define roles and expectations.[177] The underlying principle for the performance of the obligations under the IHS is safety, and the master of a ship is responsible for safety of vessel, crew and passengers.[178] Before a ship arrives at a port in New Zealand, it needs permission from a MAF Biosecurity Clearance Office. Before permission is granted, the master of the ship must show that "ballast was, or will be exchanged adequately" in mid-ocean.[179] However, an exemption would be granted if the master can demonstrate that an exchange of ballast water could not be undertaken due to safety concerns.[180] The IHS applies to ballast water taken up by a ship outside the territorial waters of New Zealand and intended for discharge within the maritime jurisdiction of New Zealand.[181] However, the ballast water taken up in New Zealand's waters or emergency discharge of ballast water taken up outside New Zealand's maritime jurisdiction is excluded.[182]

The IHS defines ballast water to include sediments and in this regard sediments in tanks, sea chest or plumbing.[183] This is an extensive definition. An inspector is appointed to ensure compliance with the standards set. This officer is appointed under the Biosecurity Act.[184]

Ballast water discharge is not permitted unless an inspector authorized under the law permits it. The inspector may give permission upon the proof of satisfaction of at least one of three options. First, the master of the ship must demonstrate that ballast water free from coastal influences was exchanged en route to New Zealand at least 200 NM from land.[185] The process

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[176] Ibid, at 1209.
[177] Id, at 1208.
[178] IHS, supra note 171, at 1.
[179] http://www.biosecurity.govt.nz/enter/ships/ballast. (Retrieved: October 10, 2012).
[180] Id.
[181] IHS, supra note 171, at 1.
[182] Id.
[183] Id, at 1.
[184] No. 95 of 1993, supra note 167, section 103.
[185] IHS, supra note 171, at 2.

adopted for the exchange must lead to at least 95% exchange of the ballast water in the tanks.[186] The next option is to prove that the ballast water is fresh.[187] The next option is to prove that the ballast water has been tr

entering the US maritime jurisdiction.[205] The mandatory requirements fall under the Coast Guard Regulations under NISA.[206] There are some exceptions including exclusion of crude oil tanker engaged in coasting trade.[207]

Ships travelling to the Great Lakes and Hudson River are required to undertake ballast water management.[208] Also, as part of its efforts at making compliance effective, the US established a National Ballast Information Clearinghouse. All ships entering the EEZ of the US are supposed to submit to the NIC an electronic ballast water reporting form.[209]

The EPA proposed issuing to permits to regulate discharge from commercial vessels. These permits would cover ship-source pollutants and reduce the risk of introduction of HAOP from ballast water.[210] Additional requirements for ballast water management are imposed at the State level.[211] Some of these State level regulations were more stringent than the federal regulations. In November 2011, the US Congress passed a law, the Coast Guard and Maritime Transportation Act of 2011,[212] stripping States of the authority to set ballast water standards that are more stringent than that of the federal level.[213] In effect, only the Federal Government may impose higher standards of ballast water management. Also, under the law, it is expected that a new national standard for the treatment of ballast water would be established in accordance with IMO standards.[214]

3.4: Overview and Conclusion

In this chapter, ballast water management in a number of jurisdictions was examined. These countries were Canada and India. Regional cooperation in respect of ballast water

[205] http://www.invasivespeciesinfo.gov/laws/federalres.shtml#ballast. (Retrieved: October 10, 2012).
[206] 33 CFR 151 Subpart D. Available at: http://www.gpo.gov/fdsys/pkg/CFR-2005-title33-vol1/pdf/CFR-2005-title33-vol1.pdf. (Retrieved: October 9, 2012).
[207] Id, Subparts C and D.
[208] McConnell, Globallast Legislative Review, supra note 4, 79.
[209] http://invasions.si.edu/nbic/submit.html. (Retrieved: October 10, 2012).
[210] http://www.invasivespeciesinfo.gov/laws/federalres.shtml#ballast. (Retrieved: October 10, 2012).
[211] McConnell, Globallast Legislative Review, supra note .., 79.
[212] H.R. 2838. Available at: http://www.gpo.gov/fdsys/pkg/BILLS-112hr2838eh/pdf/BILLS-112hr2838eh.pdf. (Retireved: October 10, 2012).
[213] H.R. 2838, sec. 705. Available at: http://www.csgmidwest.org/policyresearch/1111ballastwater.aspx. (Retrieved: October 10, 2012).
[214] http://www.invasivespeciesinfo.gov/laws/federalres.shtml#ballast. (Retrieved: October 10, 2012).

involving Canada and India was also considered. An overview of ballast water management practice in Australia, New Zealand and the US was considered. The purpose of this examination was to offer some lessons to guide Ghana in its developing a comprehensive legislative and implementing regime.

It is evident that increasingly every State is being confronted with the issue of HAOP introduced through ballast water and sediments, as well as vessel fouling. The harmful impact of HAOP is emphasized by all the countries. Various regulations and approaches have been adopted largely along the lines of the IMO Guidelines which in turn are the foundation for the BWMC.

It is evident that legislative characterisation of HAOP introduced through ships' ballast water and sediments have not been a simple task. In lots of respects, it has been considered a manifestation of an environmental threat through ship-source pollution. It is for this reason that no single legislation is adequate to encompass the various issues that it brings up. While it has been considered to be a biodiversity concern, others view it as a human health concern. In some case, it is characterised as a mix of all these concerns. But this must not hold back any State from taking action to deal with the problem, be it shipping-based regulation or environment-related. There is also the need to consider specific roles as flag State concerns differently from coastal State interest. From the discussion of the approach adopted by the various countries, it is clear that there is no single way to characterize HAOP introduced through ballast water. For example, in Canada, it is dealt with as an environmental as well as a ship-source problem. In Australia and New Zealand, it is addressed as a quarantine and biosecurity issue respectively. However, it is apparent that all the jurisdictions recognize that shipping responsible for the unintentional transfer of HAOP through ballast water and sediment discharge. Therefore, in developing a ballast water management regime, there is a need to address all of these components; shipping, environmental, biosecurity, quarantine and health. As McConnell noted in 2002,[215] this is a period of transition for many countries. Therefore, it is apparent there need not be strict legal characterisation of HAOP introduced through ballast water and sediments, but, rather States need to look to adopt effective management approaches, such as ICZM, as is being pursued in both Canada and India. One thing that is certain is that there is a need to develop comprehensive

[215] McConnell, Globallast Legislative Review, *supra* note 4, at 98 – 99.

national regimes to address this concern. At the international level, the BWMC is one other approach adopted to regulate ships and technology to prevent, minimize and manage the introduction of HAOP.

It also emerged that cross-agency collaboration is central to the successful implementation of ballast water management control in all the countries studied. Canada places importance on this institutional cooperation, thus this component of a successful implementation regime is underscored in legislation. However, it is evident that inadequate funding in even developed countries is likely to roll back the success of the implementation of the BWMC. Therefore, States considering ratifying and implement the BWMC domestically should consider where to place the responsibilities so as to get the desired results.

From both developed and developing countries' perspectives, the threat of HAOP cannot be handled exclusively as a national concern. Increasingly, it is a regional issue within a global context. The Canada's successful cooperation with the US w 92he US anage 12w8ur13soi0nrol of

CHAPTER4 – Toward an Effective Ballast Water Management Regime in Ghana

4.1: Introduction

Chapter 1 was a discussion of the characteristics of ballast water and an overview of the subsequent chapters.

In Chapter 2, the international regulatory framework relating to ballast water was considered. General framework instruments such as United Nations Convention on the Law of the Sea, 1982 (UNCLOS)[1] and Convention on Biological Diversity (CBD)[2] were considered. Also, some key documentary outcomes of international conferences were disused. In that regard, the Rio Declaration, Agenda 21, and more recently Rio+20 and the Oceans compact were examined. The conclusion of this examination was that, States which are party to UNCLOS and CBD are already under a duty to protect their marine environment from bio-invasion, including HAOP introduced through ballast water. In Chapter 2, the International Maritime Organisation (IMO) Guidelines predating the International Convention for the Control and Management of Ships' Ballast Water and Sediments, 2004 (BWMC)[3] were examined. Also, the BWMC was examined in detail. To understand the scope of responsibility either as a flag State or coastal State and how it impacts implementation at the domestic level, it was necessary to consider salient provisions and other related matters regarding the BWMC. The conclusion was that, though the BWMC was primarily a flag State convention, it outlined some important obligations for coastal States intending to ratify the BWMC and implement it. In all, it is important that the BWMC is ratified to complement the provisions under UNCLOS and CBD, as well as ensure conformity across different jurisdictions with regards to implementation of the BWMC.

Chapter 3 was a discussion of national practices relative to ballast water management. The essence of this chapter is that, to be able to make suggestions in relation to the development

[1] https://www.un.org/depts/los/convention_agreements/texts/unclos/UNCLOS-TOC.htm. (Retrieved: October 25, 2012).
[2] http://www.cbd.int/convention/text/. (Retrieved: October 26, 2012).
[3] BWM/CONF/36, February 16, 2004.

through ballast water and sediment discharge, Ghana has commenced various domestic efforts to address the ballast water concern. In addition to the NBWMS, draft ballast water legislation has been put together. The purpose of the draft law is to give effect to the BWMC when Ghana ratifies it. Also, a PBBS has been conducted at the Tema Port, one of the two seaports in Ghana. The survey was to ascertain the presence of HAOP in the port's waters. These form the entirety of domestic response directed at the threat of ballast water and sediment discharge so far. The examination of these responses is to ascertain the adequacy of each of these and identify areas of improvement.

The third part of this chapter focuses on the regional approach. There, there have been a number of regional institutions and instruments which implicate ballast water management The existing regional maritime administration framework includes the Memorandum of Understanding on Port State Control for West and Central African Region (Abuja MoU), and the Ports of West and Central Africa Management Association (PWAMCA). Also, there are regional instruments related to environment protection. These are the Economic Community of West African States (ECOWAS) Environmental Policy, The Convention for Co-operation in the Protection and Development of the Marine and Coastal Environment of the West and Central African Region (Abidjan Convention) and the Guinea Current Large Marine Ecosystem (GCLME). The discussion is in two sections. The first is a discussion of the instruments related to maritime administrations. The second part is an examination of the instruments related to environmental protection to identify whether they adequately provide for HAOP introduced into the marine environment. The chapter conclmge65.7C2_egion

4.2.1: The 1992 Constitution

The Constitution of the Republic of Ghana (1992 Constitution)[7] enjoins the State to take appropriate measures to protect and safeguard the national environment for posterity.[8] The corresponding obligation is that each citizen is also required to assist in the process of protecting and safeguarding the environment.[9] Though the Constitution does not directly refer to the marine environment, the reference to environment, by extension, includes the marine environment.[10] Also, the Constitution, does not specifically mention biodiversity. However, the reference to environment under article 36(9) of the 1992 Constitution is a basis for the State to control and manage invasive species.[11]

implementing a convention for the control of invasive alien species must be in consonance with Ghanaian environmental law and policy, and in fulfillment of Ghana's treaty obligations.[16]

Beyond the 1992 Constitution, invasive species management is implemented under various pieces of legislation. This is considered next.

4.2.2: Other Legislation Applicable to Invasive Species Management

Invasive species management in Ghana is a multi-sectoral responsibility.[17] The lead agency for the protection of the environment is the Environmental Protection Agency, 1994, (Act 490) (EPA). One of the functions of the EPA is to coordinate the activities of bodies concerned with the technical or practical aspects of the environment.[18] In relation to the marine environment, the Ghana Maritime Authority (GMA) also collaborates with other agencies to prevent ship-source pollution, marine environment protection and response to marine environmental incidents.[19]

There are other relevant institutions such as Plant Protection Regulatory Services Department (PPRSD) which is responsible quarantine services.[20] In recognition of the problem posed by HAOP introduced through ballast water and sediment discharge, and after a series of international and regional meetings, the NBWMS.[21] This is the preparatory works upon which a comprehensive regulatory regime will be developed to deal with the problem.

Also, Ghana has enacted law to bring into effect the delimitation zones provided in UNCLOS. This is provided in the Maritime Zones (Delimitation) Act, 1986.[22] Among others, [redacted]clared a territorial sea and exclusive economic zone (EEZ).[23] Under section [redacted]law provides thus –

The NBWMS was developed around four broad issue-areas: incorporation of ballast water management into invasive species management; ballast water management; implementation plan and funding. The discussion of the NBWMS is set out in this manner.

4.3.1.1: Incorporating HAOP introduced through ballast water into Invasive Species Management

Coastal zone management and conservation, in Ghana, has been identified to be minimal.[28] The NBMWS noted that port and shipping-related activities such as the prevention of the introduction of HAOP through ballast water were not integrated in the invasive management plan of Ghana.[29] The focus of invasive species management has been terrestrial and inland waters.[30]

As has been the case with many developing

4.3.1.2:

7. Marine Fisheries Research Division of the Ministry of Food and Agriculture.

The NBWMS identifies the GMA has adopted the role of lead agency for the implementation.[41] The EPA is the lead agency under the national strategy on invasive species.[42] Since March 2006, the EPA has initiated an integrated invasive species management programme, but this has been focused on inland water bodies. Therefore, the EPA and GMA are expected collaborate in any implementation efforts that would be developed.

Also, a National Task Force (NTF) on ballast water has been set up. The importance of having an NTF is to ensure consensus in policy development and implementation.. A critical component of the NBMWS is scientific research. Therefore, relevant stakeholders have been tasked to initiate scientific research to aid policy implementation.[43] This includes continuous biological surveys at the ports to assess the risk of introduction in the port basin and surrounding environment.[44]

The NBWMS recognized a shortcoming in the composition of the NTF. It recommends the inclusion of the National Development Planning Commission (NDPC). Under the 1992 Constitution, the NDPC is responsible for advising the President on national development policy, planning and strategy.[45] Thus, the NDPC plays a critical role in national policy development and in this regard, can bring to the awareness of the Executive the challenges posed by HAOP introduced through ship ballast water, therefore, and it must be included on the NTF. In addition to the NDPC, other key representations are absent. The Ministry of Health (MoH) represented by the Ghana Health Service (GHS) is absent. Public health risks arising from HAOP cannot be underestimated. As noted earlier, Ghana has a history of cholera outbreak. The outbreak of cholera is almost a perennial occurrence and its spread may prove to be a challenge. As said earlier, ballast water has accounted for the spread of diseases such as cholera in other parts of the world.[46] Therefore, the inclusion of the GHS would ensure that there is a holistic policy

[41] Ibid, at 27.
[42] CSIR, The enabling policy and institutional environment for invasive plant management in Ghana, supra note 17, at 16.
[43] NBWMS, supra note 14, at 26.
[44] Id, at 20.
[45] 1992 Constitution, supra note, arts. 86 and 87; See also http://www.ndpc.gov.gh/ (Retrieved: August 4, 2012).
[46] http://globallast.imo.org/poster4_english.pdf. (Retrieved: October 14, 2012).

development and implementation which reflects public health concerns. A critical impact point of HAOP is the tourism sub-sector. The Ghana Tourist Authority (GTA)[47] established by the Tourism Act, 2011 (Act 817), is not represented on the NTF. As part of its mandate, the GTA advises the Government on the sustainable development of tourism and environmental guidelines for tourist operations.[48] Therefore, the absence of the GTA would lead to a non-representation of coastal tourism concerns, an important component of the national income. Another key institution missing from the NTF is the Plant Protection and Regulatory Services Department (PPRSD).[49] The PPRSD is mandated to organize, regulate, implement and coordinate plant protection services in aid of sustainable development of agriculture. Central to the mandate of the PPRSD is the reduction of plant loss due to pests and diseases.[50] As the national focal point for plant protection, quarantine services and the implementing agency of Ghana's obligations under the IPPC, it is imperative that the NTF is expanded to include the PPRSD.

4.3.2: Biological Surveys

Until recently, there had not been any study into the extent to which ballast water is a major pathway for the introduction of HAOP. In this regard, the NBWMS recommended the conduct of port biological baseline surveys at the Tema and Takoradi Ports as a necessary first step to gather data on the subject. It is important to note that subsequently, the GPHA conducted a water quality and biological baseline survey at the Tema Port.[59] The conduct of the biological survey at the Tema Port is a significant step, the first of its kind. The purpose of the survey was to –

> 1. Make an inventory of native, non-indigenous and cryptogenic plankton (phytoplankton and zooplankton), benthic organisms and fish species present in the Tema Port of Ghana.
> 2. Provide information on the distribution and abundance of native, non-indigenous and cryptogenic species present within and around the port.[60]

The survey notes that "[S]pecies of organisms identified at the Tema port do not pose any threat of invasion." The survey noted that, there are a number of non-native and cryptogenic species within the port environment.[61] It also calls on the port authorities to initiate steps to manage these species so that they do not spread, in that regard, the In the PBBS report for the Tema Port, it was noted that there are a number of non-native species within the port. It was reported that –

> Investigation of the native, non-indigenous and cryptogenic species at the Tema port revealed no invasive species or any species that may be considered as a pest…It is however likely that some of the numerous cryptogenic species encountered may be as result of introduction from foreign waters by ships visiting the Tema port but since inadequate information exist on these species, they retain their status as cryptogenic until future studies and monitoring establishes their native or non-indigenous status.[62]

[59] PBBS, supra note 15, at 7.
[60] Id.
[61] Id.
[62] Id, at 71 – 72.

> remove all risk, but does reduce the abundance and diversity of coastal species that may be discharged to the Tema port.[68]

In addition to ballast water and sediment discharge, hull fouling has being identified as a major potential pathway for the introduction of HAOP into Ghana's coastal waters. The PBBS noted that in the case of Australia, hull fouling accounted for almost two-thirds of marine invasive species introduction as opposed to ballast water.[69] The absence of an international regulatory framework has contributed to the spread of invasive seaweeds. Invasive seaweeds have been identified to be transported between countries not only through ballast water, but hull fouling as well, ship's anchor, and loading equipment. Thus, it has been said that –

> These may be considered along with ballast water, as unintentional transfers in the sense that they are by-products of the operation of shipping, as distinct from intentional transfers of alien species, albeit on board a ship. Concerns have been expressed about these other unintentional or operational vectors in various fora, but so far there is no specific international regulatory development.[70]

Therefore, the PBBS recommends that hull fouling should be given equal attention since it is capable of bio-invasions from ships' hulls".

The feasibility of this provision is called into question when one examines the current response

4.3.6: Summary

4.4.2: Regional Instruments Related to Maritime Administration

4.4.2.1: Port State Control

With regards to the shipping industry, a number of organizations are prominent in the West and Central African region. These are either port state control or port management administrations. The Abuja MoU was established as one of the ten global regional MoUs pursuant to IMO Guidelines on Regional Co-operation in the Control of Ships and Discharges adopted in 1991.[99] There are 22 Member States of the Abuja MoU straddling the Atlantic coast of Africa from Mauritania to South Africa. The purpose of the Abuja MoU is to enforce Port State Control (PSC). Under this PSC arrangement, the Abuja MoU seeks to ensure ships' compliance with the relevant international conventions relating to a range of shipping-related activities such as maritime safety and marine pollution.[100] The PSC is complementary in character, as primarily, the responsibility to ensure proper standards rests with flag States.[101] Ghana is a signatory to the Abuja MoU.[102]

The Abuja MoU is one platform through which the challenges of ballast water management at the regional level can be addressed. As a PSC body, primarily, it is the first point of contact for maritime regulators to address this problem through collaborating with sister institutions. However, the Abuja MoU has its fair share of challenges.[103] The Abuja MoU is in the process of aligning its records to well-established PSC bodies such as the Paris MoU.[104] However, there is much to be done in that regard. Currently, there is no requirement by the Abuja MoU on ballast water management. To have an efficient record system, there is a need for up-to-date information from the participating countries with regards to inspections, detection of defects and detention. The 2011 Port State Inspection Report of the Abuja MoU was primarily

[99] IMO Resolution A.682(17). Available at: http://www.imo.org/blast/blastDataHelper.asp?data_id=24510&filename=A682(17).pdf. (Retrieved: August 8, 2012).
[100] http://www.abujamou.org. (Retrieved: August 6, 2012).
[101] Preamble of the Memorandum of Understanding on Port State Control for West and Central African Region (WCA-MoU-PSC) http://abujamou.org/assets/memorandum.pdf. (Retrieved: August 12, 2012).
[102] http://www.abujamou.org. (Retrieved: August 12, 2012).
[103] "Why Abuja MoU on Port State Control is not working" Available at: http://www.shipsandports.org/Why_Abuja_MoU_on_Port_State_Control_is_not_working.php?id=1. (Retrieved: August 20, 2012).
[104] Annual Report 2011, at 20. Available: http://abujamou.org/post/41.pdf (Retrieved: August 11, 2012).

based on data submitted by 9 of the 22 Member States. A total of 1,483 ships were inspected, 129 vessels with deficiencies were recorded and 11 vessels representing 1% of total number of ships inspected were detained. This represents a woefully inadequate reporting structure across

implementation of environmental management in the ports.[115] This problem, if not addressed, would make it impossible for effective implementation of ballast water control and management measures in the ports in the region This would bring together the maritime administration aspect and the environment management aspect of the problem, thereby creating a holistic approach to the addressing the ballast water concern. This arrangement can be operated under the various large marine ecosystem projects with the GCLME coordinating the implementation within the West and Central Africa region.[116] This is particularly helpful in the light of the fact that in some of the countries, the environmental and maritime administrations play complementary roles at the domestic and regional levels. Due to the problem of funding, it is important that in the designation of lead agencies at the national level, whichever institution is chosen as lead agency does not isolate itself. This would reduce unnecessary tension among these complementary institutions and prevent a spillover effect onto the regional scene.

4.4.3: Regional Instruments Related

the GCLME is to reduce land and ship-based pollution.[118] Ghana is a member of the GCLME. Of all these regional institutions, it is the GCLME that has given a lot of attention to the issue of ballast water management.

Prior to the GCLME project,[119] there was no assessment of water-related environmental concerns on a regional basis. A Trans-boundary Diagnostic Analysis (TDA)[120] was carried out to identify the threats to the Gulf of Guinea region. The TDA was organized on thematic areas, one

mechanisms. Also, there is a need to set up port reception facilities. However, it has been noted that most countries in the region do not have in place the necessary regulatory framework and reception facilities. Notably lacking in most of these countries is the human capacity to supervise the implementation of effective port or coastal regulation regarding the coastal environment.[123] Undoubtedly, ineffective and inefficient implementation continues to be the bane of successful environmental regulation across the region.

Subsequent to the TDA, and in line with its commitment to the protection of the marine environment, the GCLME held a series of meetings to discuss ballast water and sediment discharge and its implication for the marine and coastal environment of the region. The first meeting[124] was funded by the Global Environment Fund (GEF) and IMO. This effort was also supported by a number of UN-related agencies such as the UNEP, UNDP, NOAA and the African Union New Partnership for Africa's Development. This meeting was part of the broader Globallast Partnerships effort in which West and Central African states were selected to participate.[125] The Report identified that though most of the participating countries had not conducted any extensive study into invasive species occurring in their coastal environment, the incidence of tiger prawn and nypapalm were reported in Cameroon and Nigeria. The tiger prawn

The GCLME met again in 2009,[128] and it was discussed that members should take steps to ratify and implement the BWMC.[129] Also, the meeting was to afford the opportunity with the lead partnering country, Ghana, to share its experiences on the state of implementation and challenges at the legal, institutional and management level. Ghana highlighted the recent oil find as the giving rise to the risk of invasion and potential threat to the marine ecology and human health.[130]

Within the region, a number of activities have taken place in member countries regarding the management of ballast water. These are characterized as policy or legal, management and institutional responses. With regards to policy and legal responses, it has been noted that processes regarding ratification differ.[131] Currently, only Nigeria, Liberia and Sierra Leone have ratified the BWMC and acceded to it within the entire region comprising 22 countries, well over eight years since the BWMC was adopted. [132] This is rather not encouraging. A number of countries have begun the process of ratification. Others have also deposited instruments of ratification of the BWMC. These are Cote d'Ivoire, Guinea Bissau and Togo. With regards to Ghana, the lead partnering country, it is in the process of putting together instrument of ratification. Some others, such as Cameroun, are in the pro

the region are indicative of the challenges that any future regional action on implementation is likely to be confronted with in terms of harmonizing legal requirements across the region.

With regards to management response, some weaknesses have been identified. Generally, management practices in the region, with regards to ballast water management are poor or non-existent in some areas. Management authorities are adequately informed on the problem posed by ballast water and sediment discharge. Also, the frontline officers tasked with inspection have been identified as lacking the requisite training knowledge or capacity to enforce any control at the ports, thus ballast water is discharged without adequate control measures being instituted to check the introduction of HAOP. Directly connected to this issue is the fact that most of the ports are not fitted with reception facilities even in countries where there is knowledge about the BWMC or countries that have ratified the BWMC.[134] It was also reported that there is low public awareness.[135] Whether it is the shipping community or the general public, there is a relatively low knowledge about ballast water and its impact on the environment and human health.

One of the biggest challenges that emerged was the problem of institutional response in the respective countries. With the growing knowledge of ballast water, the formulation of legal rules and development of a response framework by the different institutions implicated has led to conflicts. Generally, it has been noted that three institutions are experiencing overlaps in this regard. These are the environment, transport and science ministries.[136] This problem was manifest in the composition of the Region333.06 Tm[(a[(m)8(af.91101 Tw -8ff1the respectivnt,)2ion of t-

with the Abidjan Convention to develop a broad scheme for a wider management of the problem.[140] This is particularly important because some of the Member States of the GCLME straddle other large marine ecosystems,[141] so there is a need to have in place not just a harmonized regulatory framework in the GCLME, but with the adjoining ones as well.

The GCLME countries are beginning to build consensus around ballast water management with a focus on addressing it as both shipping and environmental problem. But, this is not clearly reflected at the various national levels. In some countries, it is considered largely a shipping issue, others view it as environmental. As observed earlier, it may yet be early to place ballast water management under any particular domestic institution since national practice is still developing.[142] Rather, the institutions whose activities are related to the ballast water concern, should integrate their activities to deal with a common problem. Transposing this national treatment of the problem to the regional level may imply a challenge which mirrors the different approaches at the various national levels, which, may somewhat stultify progress at the regional level. The requirements for enforcement would vary from country to country and even more so at the institutional level within each country. Therefore there is a need to agree on the characterisation of the problem at the regional level. This would inform national responses. When this is not properly done, when the region begins to develop mechanisms for implementation, some domestic responses by some countries may not accord with the regional plan of action.

The issue of ratification of the BWMC remains a topical one across the region without much result yet. Thus far, only 3 countries have

4.4.3.3: ECOWAS Environmental Policy

In 2008, the ECOWAS put out a regional policy document to address environmental concerns in the region. This is called the ECOWAS Environmental Policy.[145] It recognizes, as a major weakness in the management of the environment, ineffective collaboration and links among the various institutions responsible for the environment, as well as inadequate human, technological and financial resources.[146] The policy is dedicated, among many things, to the sustainable management of coastal, island and marine ecosystems. In this regard, it intends to ensure sustainable exploitation of marine resources, protection of coastal environment from pollution arising out of oil exploitation and conservation of biodiversity.[147] Interestingly, the policy makes no specific mention of invasive species which has dominated global discussions in recent years.

However, with reference to conservation of biodiversity, it may be inferred that invasive species control is implied. A Supplementary Act to the policy was subsequently adopted.[148] This Act places a duty on all member states to harmonize their regulatory mechanisms relating to the environment.[149] Since the rules relating to invasive species control remain relatively scattered across several laws, it would have been helpful if there was a specific reference to invasive species in the policy as well as the Act to give guidance to policy makers who would be engaged in the harmonization of these separate national regulations. This would particularly assist in a regional consensus-building, and through the ECOWAS Parliament, the countries in West Africa can begin to develop similar legislation. The reason is that the ECOWAS Parliament is a forum for dialogue, consultation and consensus for the representatives of the various houses of legislature to advance the course of regional integration especially in the area of law-making. It is also to be consulted on the community policy on environment.[150] This is a unique opportunity that has not been fully exploited. For example, under the GCLME efforts, Ghana is designated as

[145] ECOWAS Environmental Policy. Available at: http://www.comm.ecowas.int/dept/d/d2/en/ecowas_environment_policy.pdf. (Retrieved: August 12, 2012).
[146] Id, at 12.
[147] Id, at 21.
[148] Supplementary Act A/SA.4/12/08 RELATING TO THE ECOWAS ENVIRONMENTAL POLICY. Available at: http://www.comm.ecowas.int/dept/d/d2/en/ecowas_environment_policy.pdf. (Retrieved: August 24, 2012).
[149] Id, art. 12.
[150] http://www.parl.ecowas.int/english/parliament.htm. (Retrieved: August 23, 2012).

CHAPTER 5 – FINDINGS, RECOMMENDATIONS AND CONCLUSION

5.1: Overview

This study sought to examine the options for a legislative and regulatory framework for the prevention, control and management of harmful aquatic organisms and pathogens (HAOP)[1] introduced into Ghana through ships' ballast water and sediment discharge. The purpose for this enquiry was to ascertain Ghana's readiness to deal with the ballast water concern which has become a topical issue in global discourse due to the negative impacts of ballast water-induced HAOP on marine ecology and human health with its associated economic losses.

In this regard, the international regime for the control and management of HAOP and

States differ. However, best practice shows there is a consensus that a comprehensive integrated implementation regime is the foundation for successful implementation efforts. Also, it was noted that individual domestic regulation alone does not guarantee success if that does not translate into cooperation with neighbouring states, including a region.

Ghana's current activities in relation to ballast water management were also examined in detail in Chapter 4, in particular, the National Ballast Water Management Strategy (NBWMS),[5] draft ballast water legislation (draft BWM Bill or draft law)[6] and water quality and biological baseline survey (PBBS).[7] It was found that these activities are inadequate in terms of legislation and capacity of regulatory institutions. Ghana's regulatory framework on invasive species does not provide adequately for HAOP introduced through ballast water.[8] Ghana bears international legal obligations to provide a domestic framework to address the deleterious effects of invasive species, including all pathways of introduction and through ballast water and sediments. Thus, Ghana's legislative and regulatory framework falls short of its obligation. With a burgeoning oil production and increase in maritime trade, particularly where tankers are arriving at Ghana's ports with ballast water, it is imperative that Ghana puts in a place a comprehensive framework to counter the emerging problems of HAOP introduced through ballast water. Some proposed recommendations are considered next.

5.2: Recommendations – Moving towards developing and implementing an effective HAOP Management Regime in Ghana

In the light of the foregoing, the following recommendations are proposed to guide Ghana in developing a comprehensive legislative and implementation scheme for ballast water management in Ghana. These recommendations are organized into domestic and regional actions.

[5] The preparation of the draft NWBMS was commissioned by the Ghana Maritime Authority with support from the IMO. Source: IMO Regional Office for West and Central Africa (Anglophone), November 20, 2011.
[6] The preparation of the draft BWM Bill was commissioned by the Ghana Maritime Authority with support from the IMO. Source: IMO Regional Office for West and Central Africa (Anglophone), November 20, 2011.
[7] Water Quality & Biological Baseline Survey of the Port of Tema, Ghana. Prepared for the Ghana Ports and Harbours Authority by the Department of Oceanography and Fisheries, University of Ghana. 2011.
[8] Council for Scientific and Industrial Research (CSIR), The enabling policy and institutional environment for invasive plant management in Ghana (Accra, Ghana: 2009), at 33.

5.2.1: Domestic Action

1. Ratification of the BWMC

Ghana has ratified UNCLOS and CBD, however, it has not ratified the BWMC. The no more favourable treatment principle under the BWMC makes ships flying under the authority of a non-Party subject to the application of the BWMC within the jurisdiction of a Party. Although Ghana is not party to the BWMC, it is a member of IMO, therefore, Ghana can implement the 1997 IMO Guidelines[9] through the adoption and application of national laws.

However, the ratification of the BWMC and its domestic implementation would complement the environmental protection mechanisms spelt out in UNCLOS and the CBD relative to the introduction of HAOP through ballast water and sediment discharge and bring Ghana's domestic law and policy into conformity with that of its neighbours and the international community at large. In essence, the BWMC expands on the measures provided in these two international instruments. Ratification and domestication of the BWMC by Ghana would greatly assist its implementation efforts by making domestic ballast management regulations conform to internationally acceptable standards.

2. Ballast Water Management Policy

It is necessary to have in place a domestic policy on ballast water management. Ghana's NBWMS recognized the need for such a policy. The creation of a policy at the central government level with the involvement of all relevant stakeholders including the regulatory institutions, shipping industry, users of coastal resources, coas

also incorporate vessel fouling into its ballast water management policy so as to have a holistic approach to addressing all pathways for the introduction of HAOP.

3. Port and Coastal Assessment

Port surveys of coastal diversity are crucial in the management and control of HAOP. They act as early warning detection systems for timely remediation. In 2010, a port survey was conducted at Tema Port, one of the two sea ports in Ghana, the other being Takoradi Port. The Takoradi Port is the hub of oil production activities. The number of ships calling at the Takoradi Port has increased in recent times. Bearing in mind that the better approach to dealing with HAOP is prevention, there is a need to conduct a port survey at the Takoradi Port to ascertain the nature of species and other organisms in the port waters, and take remedial action in a timely manner if there is presence of non-indigenous species. Therefore, the significance of such a port survey would assist in future monitoring of non-indigenous species, to prevent bio-invasion.[10] It would also assist in identifying areas for the uptake of ballast water is not "high risk" areas, or discharge zones for designated for ballast water are "safe". This must be a continuing exercise, part of implementing the composite scheme and by it, ensure regulations are constantly updated.

Beyond port surveys, there is a need to conduct a full coastal assessment within the coastal waters of water. As part of ballast water management measures, alternate discharge zones must be identified for ships to perform ballast water exchange. In order not to turn these alternate discharge zones into marine reservoirs for growing and distributing HAOP, there is a need to conduct a proper assessment before any designation is made. This is very important looking at the relatively short coastlines that Ghana has, the spread of invasive species may be faster than other jurisdictions.

4. Expansion of NTF

The NTF as it is currently composed is not representative of a number of all relevant parties that may be implicated or interested in the adoption of any ballast water management measures, be it

[10] PBBS, supra note 7, at 73.

administrative or legislative. The NBWMS recommended the inclusion of the NDPC.[11] In this study, it is further recommended that the GTA, PPRSD and GHS should be represented on the NTF. The utility of this recommendation is that these are critical institutions in terms of water quality, coastal tourism, and quarantine and health service provision. These institutional representations should be involved from the outset: NTF, development of the NBWMS, the national ballast water management policy, development of applicable legislation and finally with implementation. The NTF should serve as the node for institutional coordination for enforcement of domestic legislation on ballast water and sediment discharge.

5. Regulating Ballast Water through the adoption of Port Regulations

As identified earlier, the Ghana Ports Harbours Authority (GPHA) has power to make regulations regarding ballasting activities at the ports. It is recommended that while ratification of the BWMC and its subsequent domestication goes through Ghana's legislative processes, the GPHA may exercise its authority more rapidly to provide for ballast water measures within the port environment under section 24(1)(c) of the GPHA Act. The GPHA, in exercising this power, should provide for sediment reception at the ports as well, so that ballast tank sediments can then be treated at the facility before disposal.

6. Institutional Collaboration

The issues relating to ballast water and sediment discharge are not shipping context-specific. It should be discussed within the broader context of environmental rules.[12] As noted in Chapter 3, the approaches on the management of ballast water range from quarantine and biosecurity laws. It is evident that domestic practices in the various jurisdictions considered in Chapter 3, have evolved and responsibilities have moved around institutions until a degree of certainty as to the legislative characterisation of HAOP was achieved. Therefore, the agencies, endowed with the needed expertise in the various fields implicated in the ballast water concern are expressly tasked under legislation. Thus, the draft law should be reviewed to reflect this fact.

[11] NBMWS, *supra* note 5, at 27.
[12] Rolim, The International Law on Ballast Water: Preventing Biopollution, *supra* note 1, at 150.

In the process of legislating ballast water management, there is it is necessary to take account of differing institutional capacity and how that could impact effective implementation. In this regard, the draft legislation must be formulated to include a collaborative council with specific roles assigned to each institution. The cross-institutional arrangement would ensure a workable framework which can then crystallize into legislation. This arrangement would curtail the possibility of regulatory conflicts.

7. Reviewof the Draft BWM Bill

The draft law in its present state is inadequate. As discussed in Chapter 4, there is a need for Ghana must adopt a broader approach to the problem of ballast water management. As noted in the discussion of the weaknesses of the BWMC in Chapter 2, it was evident that the BWMC does not provide for the management of hull fouling which is increasingly becoming a leading vector for the introduction of HAOP in various jurisdictions. The report on the water quality and

8. Integrated Coastal Zone Management Legislation

The current global trend on the management and control of pollution of the marine environment is integration. As evident in Chapter 3, in all the national practices considered in this study, the integrated approach manifests itself as integrated ocean management or integrated coastal zone management. This practice needs to be formalized in Ghana under a dedicated legislation which outlines the various roles to be played by the institutions that come under this proposed law.

A coastal zone management law would establish an authority to provide policy direction and standards for ocean and coastal management. Also, this body would be tasked with promoting inter-sectoral coordination to minimize inter-agency struggle, and to reduce duplication of efforts by parallel institutions.

Under such legislation, legislative and regulatory proposals on ocean and coastal management can be initiated and legislative reforms coordinated. The legislation would also strengthen a multi-disciplinary approach to management procedures regarding the marine space and enhance public-private partnerships as well as community involvement in decision-making.

9. Compensatory Mechanisms

introduce, are likely to introduce, or contribute to the introduction of HAOP, must contribute to this fund to ensure there is adequate funding besides government subvention for effective implementation of HAOP containment and policies.

10. Training of PSC Officers and Establishment of Research Laboratories

Training of PSC officials is necessary for efficient port management and administration. With prospects of additional responsibilities in terms of ballast water management measures, there is a need to reorganize port health requirements and train staff as well to discharge their duties in a manner that does not cause undue delay to ships.

The establishment of research laboratories to aid in speedy yet accurate testing of ballast water is necessary. Alternatively, the GPHA can explore the possibility of ceding that function to the research institutions that are capable of performing such tests and delivering rapid results. The Water Research Institute (WRI) or the Department of Oceanography and Fisheries of the University of Ghana which conducted the PBBS at the Tema Port can be engaged by port authorities to take up this responsibility. The recommendations proposed for regional action are next.

5.2.2: Regional Action

11. Cooperation

It is increasingly becoming evident that the better approach to address the invasive species problem is through regional collaboration. This calls for an audit of the current regional maritime and environmental framework to ascertain the options available for effective cooperation.

For example, Ghana must join with La Cote d'Ivoire to address the perennial algal bloom problem on the western coast of Ghana. The potential of exporting high risk ballast water demands that Ghana takes steps to address this issue. The BWMC does not address land-source pollution However, to have an effective prevention mechanism, which is at the heart of the BWMC, there is a need to address contributory developments within the land-ocean interface to reduce the risk of exporting HAOP from Ghana to other jurisdictions. This is also to promote a cleaner coastal environment.

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