

Review Article

Cleaning of Ocean Garbage Patches: A Study Under the International Legal Framework

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<p>Author Affiliation Secretary, PG Council & Faculty, Department of Law, Raiganj University, Raiganj, West Bengal 733134, India.</p> <p>Corresponding Author Diganta Biswas, Secretary, PG Council & Faculty, Department of Law, Raiganj University, Raiganj, West Bengal 733134, India. E-mail: d78biswa@gmail.com Received on 28.10.2019 Accepted on 24.12.2019</p>	<p>Abstract</p> <p>Today oceans are also being encroached by the entity called pollution. The root cause of this is using the waterways as a mode of transportation, fishing and some other reasons. Such pollution is causing threat to the aquatic ecology. As a result of this, the marine ecology is greatly under threat. Due to indiscriminate fishing the fish in the ocean is declining at a rapid pace. Looking at the same, a Dutch teenager, Boyan Slat originally dreamed up to develop a system, at the age of 16 to clean up the same while he was diving in Greece and first saw for himself the amount of plastic polluting the sea. This paper aims to discuss this issue from the context of international environmental framework.</p> <p>Keywords: Ocean; Aquatic ecology; Ghost gear; Garbage Patch; International environmental law.</p>
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Introduction

Life itself arose from the oceans. The ocean is vast, covering 140 million square miles, nearly 72 percent of the earth's surface. Not solely has the oceans invariably been a primary supply of nourishment for the life, but from the earliest recorded history it has served for trade and commerce, adventure and discovery. At the same time, unfortunately, due to the transportation through sea, unregulated fishing activities and other related activities, huge pollution is taking place into the ocean which is threatening coastal resorts and every one varieties of ocean life. One of the prime contributors to this is plastic components. Dumping of plastic garbage into the ocean is creating big issues to the problem today. Due to the dispersal effects of the ocean water, such dumped garbage gets concentrated create garbage patches. These garbage patches are comprised of many different kinds of materials

and, although they are located in the same region, often change shape and form because of the influence of tides and other climate factors. One of the most fatal components of these garbage patches is plastic. Unfortunately, up to 90 percent of the world's plastic items are never recycled, and scientists believe nearly every piece ever created is still in existence somewhere, in some form, with most going into landfill or the environment. Single-use plastic, such as water bottles and nappies, take 450 years to break down. The impact of the same may be cited as the incidents of death of 145 Pilot Whales around Stewart Island in New Zealand,¹ and death of one Sperm Whale of the 9.5 m (31 ft) near Kapota Island in the Wakatobi National Park in Indonesia with Nearly 6 kg (13 Lbs) of Plastic Waste in its Stomach in recent times.² This paper aims to study the legal framework to combat the littering into the ocean with an aim to protect the marine life.

Location of Ocean Garbage Patches & Reasons for the Formation

As the ocean current concentrates into five areas in the world, five garbage patches have been formed which are as under-

- *The Great Pacific Garbage Patch:* The North Pacific Gyre is located at the North Pacific Ocean between California and Hawaii.
- *The North Atlantic Garbage Patch:* The North Atlantic Gyre (spanning from the equator to Iceland, North American, Europe, and Africa).
- *The South Pacific Garbage Patch:* The South Pacific Garbage Patch is located at the South Pacific Ocean between Australia and South America.
- *The Indian Ocean Garbage Patch:* The Indian Ocean Garbage Patch is located at Indian Ocean Gyre (in the Indian Ocean).

Trash accumulates in 5 ocean garbage patches, the largest one being the Great Pacific Garbage Patch, located between Hawaii and California which was discovered in 1997 and contains an estimated 1.8 trillion pieces of plastic.³ The Great Pacific Garbage Patch can be loosely divided into three sections. The sections of the garbage patch can be considered the Western Garbage Patch, the Eastern Garbage Patch, and the Subtropical Convergence Zone. All of these patches join and break apart depending on the season and climate around them. The Western Garbage Patch is located off the coast of Japan, the Eastern Garbage Patch off of the western coast of the United States, and the Subtropical Convergence Zone along the upper arc of the North Pacific.⁴ The Great Pacific Garbage Patch (GPGP) spans 617,763 sq miles - more than twice the size of France, and contains at least 79,000 tons of plastic, research found last month. Most of it's created from "ghost gear"-elements of abandoned and lost fishing rig, such as nets and ropes-often from illegal fishing vessels.⁵ The Great Pacific Garbage Patch could be a vortex of trash created from associate ocean scroll within the central North Pacific. The challenge of improvement up the gyres is that the plastic pollution spreads across lots of sq. kilometers and travels altogether directions. The reasons for the emergence of garbage patches majorly are a combination of the followings:⁶

- a lack of awareness of the extent of the problem amongst the various stakeholders, including the general public;
- a lack of awareness of potential solutions for addressing the problem;

- a lack of coordination between and among the different sectors, and in particular between scientists and wider society;
- a lack of consistent and harmonised waste management and re-cycling processes;
- a lack of effective enforcement of legislation (e.g. MARPOL); and
- differing national policies and regional and local.

The trash vortex was discovered within the mid-1980s and lies halfway between Hawaii and Callifornia. Ghost gear kills more than 100,000 whales, dolphins and seals each year, according to scientific surveys.⁷ Seabirds and other marine life are increasingly being found dead with stomachs full of small pieces of such plastic. Creatures eat plastic discarded in the sea thinking it's food but then starve to death because they are not feeding properly. Others are trapped and die of starvation or are strangled or suffocated by ghost gear.

Process of Cleansing of Garbage into the Ocean

A team with a plan to have 60 giant floating scoops, each stretching a mile from end to end has started from the shores of San Francisco Bay to collect debris every six to eight weeks. The clean-up contraption consists of 40 ft pipes -made of plastic which will be fitted together to form a long, snaking tube. Filled with air, they will float on the ocean's surface in an arc, and have nylon screens hanging down below forming a giant floating dustpan to catch the plastic rubbish that gathers together when moved by the currents. The screens, however, will be unable to trap microplastics-tiny fragments.

- **System001:** System001 consists of a 600-meter-long (2000 ft) U-shaped floating barrier with a three-meter (10 ft) skirt attached below. The system is intended to be propelled by wind and waves, allowing it to passively catch and concentrate plastic debris in front of it. Due to its shape, the debris will be funnelled to the centre of the system. Moving slightly faster than the plastic, the system will act like a giant Pac-Man, skimming the surface of the ocean. The system deployed within the nice Pacific Garbage Patch is the world's largest accumulation zone of ocean plastics. It is situated halfway between Hawaii and California, the patch contains 1.8 trillion pieces of plastic, and covers an area twice the size of Texas. The main objective of System 001 is to prove the technology and begin

the cleanup, a secondary goal is to gather performance information to enhance the look for future deployments. Hence, the system is provided with solar-powered and satellite-connected sensors, cameras and navigation lights to communicate the position of System 001 to passing marine traffic, and enable extensive monitoring of the system and the environment. After delivery of the system to the nice Pacific Garbage Patch, the Maersk Launcher will remain active as an observation platform for several weeks.⁸

- **Floating Boom System:** The floating boom system was deployed on Saturday (8th September, 2018) from San Francisco Bay and will undergo several weeks of testing before being hauled into action. The floating boom system, after undergoing testing, will be towed out 1,400 miles to the garbage patch around mid-October and begin collecting trash. The floating boom drifts along side the native currents, making a formed formation. As the boom floats, it collects trash in the U shaped system, which has 10 feet of netting below it to collect smaller fragments of plastic. Once the boom is full, a vessel will meet the boom to collect the plastic and transport it to land for sorting and recycling. The idea is that the 10 feet of netting is not deep enough that fish can't swim below it, with the hope that the boom will collect trash and not fish. However, this is something that remains to be seen in the open ocean.⁹

Cleansea (Towards a Clean, Litter-Free European Marine Environment through Scientific Evidence, Innovative Tools and Good Governance): The Cleansea's aim is to generate information on the impacts (biological, social and economic) of marine litter, develop novel tools needed to collect and monitor litter and protocols needed for monitoring data (litter composition and quantities) and evaluate the impact of mitigation strategies and measures in order to provide policy options to policy makers in the EU. It targeted smart practices on all stages of the marine waste hierarchy (1) interference, 2) plan and/or reprocess, 3) utilization, 4) assortment, 5) clean-up, and 6) awareness, paying explicit attention to upstream initiatives. It further portrayed one of the primary systematic efforts to know the potential impact and conditions of success of elect best practices¹⁰ in a comparative fashion, by sharing a standard analysis protocol among partners within the four European regional seas.

International Coastal Cleanup Report, 2017¹¹

In partnership with volunteer organizations and individuals around the globe, Ocean Conservancy's International Coastal Cleanup engages people to remove trash from the world's beaches and waterways, identify the sources of debris and change the behaviours that cause marine debris in the first place. For more than 30 years, volunteers across the world have come together to become a global force for good. From 112 countries around the world, volunteers, site captains, state and county coordinators worked tirelessly to collect over 18 million pounds of trash.

Legal Framework to Combat Ocean Pollution

The international legal framework about the protection of the marine atmosphere has developed over the past fifty years through a variety of non-binding instruments and international conventions. Historically a lot of the main target of this legal framework has associated with the hindrance of marine pollution and customary law has targeted attention mostly on this side of environmental damage. In addition, various different conventions offer States with a mechanism for giving impact to their obligations underneath international environmental law to preserve and defend the marine environment.

Pre- UN Efforts

The history of protection of life forms started before the UN emerged. Two important instruments in this connection are as under-

- **Convention relative to the Preservation of Fauna and Flora in their Natural State, 1933:** The Convention aimed to preserve the natural fauna and flora of certain parts of the world, particularly of Africa, by means of national parks and reserves, and by regulation of hunting and collection of species.¹² Under Art. 8, the Convention extends protection of species listed in annex to be of special urgency and importance.
- **Protection and Wild Life Preservation in the Western Hemisphere, Washington, 1940:** The Convention aims to preserve in their natural habitats all species and genera of native American fauna and flora from extinction,

and to preserve areas of extraordinary beauty, striking geological formations or regions of aesthetic, historic or scientific value. Under Art. II, Parties to the Convention undertake to establish national parks, national reserves, nature monuments, and strict wilderness reserves.

However, these two instruments do not have much bearing in this context.

UN Efforts

The General Assembly that all resources of the sea bottom on the far side the boundaries of national jurisdiction square measure the common heritage of humanity and therefore the gathering of the national capital Conference on the Human atmosphere.¹³

Law of the Sea Convention, 1982: The Convention of 1982 settled the issues as

- Set territorial sea boundaries 12 miles offshore
- Set exclusive economic zones up to 200 miles offshore
- Set rules for extending continental shelf rights up to 350 miles offshore

Created the International Seabed Authority

UNEP: The United Nations Environment Programme (UNEP), particularly through its Regional Seas Programme, acts to protect oceans and seas and promote the environmentally sound use of marine resources aiming to preserve marine environment and biodiversity. The Regional Seas Conventions and Action Plans is that the world's solely legal framework for safeguarding the oceans and seas at the regional level. UNEP conjointly created the worldwide Programme of Action for the Protection of the Marine atmosphere from Land-based Activities. The international organization atmosphere Programme (UNEP), particularly through its Regional Seas Programme, acts to protect oceans and seas and promote the environmentally sound use of marine resources. The Regional Seas Conventions and Action Plans is the world's only legal framework for protecting the oceans and seas at the regional level. UNEP also created The Global Programme of Action for the Protection of the Marine Environment from Land-based Activities. It is the only global intergovernmental mechanism directly addressing the connectivity between terrestrial, freshwater,

coastal and marine ecosystems.¹⁴

UNESCO: The United Nations Educational, Scientific and Cultural Organization (UNESCO), through its Intergovernmental Oceanographic Commission, coordinates programmes in marine research, observation systems, hazard mitigation and better managing ocean and coastal areas.

United Nations Law of the Sea Convention (UNCLOS): The United Nations has long been

at the forefront of efforts to ensure the peaceful, cooperative, legally defined uses of the seas and oceans for the individual and customary advantage of world. Urgent involves an efficient international regime over the sea bottom and therefore the Davy Jones on the far side a clearly outlined national jurisdiction set in motion a method that spanned fifteen years and saw the creation of the international organization sea bottom Committee, the signing of a treaty banning nuclear weapons on the seabed, the adoption of the declaration by the General Assembly that all resources of the seabed beyond the limits of national jurisdiction are the common heritage of mankind and the convening of the Stockholm Conference on the Human Environment. The UN's ground-breaking add adopting the 1982 Law of the ocean Convention stands as a shaping moment within the extension of law to the Brobdingnagian, shared water resources of our planet. The convention has resolved a number of important issues related to ocean usage and sovereignty, such as:

- Established freedom-of-navigation rights
- Set territorial sea boundaries 12 miles offshore
- Set exclusive economic zones up to 200 miles offshore
- Set rules for extending continental shelf rights up to 350 miles offshore
- Created the International Seabed Authority
- Created other conflict-resolution mechanisms (e.g., the UN Commission on the Limits of the Continental Shelf)

International Maritime Organization (IMO): The International Maritime Organization (IMO) is the key world organization establishment for the event of international law. Its main role is to form a regulative framework for the shipping business that's truthful and effective, universally adopted and universally enforced. The International Maritime Organization (IMO), a key world organization establishment has adopted rules to

handle the emission of air pollutants from ships embrace the landmark International Convention for the Interference of Pollution from Ships of 1973, as changed by a 1978 Protocol (MARPOL), and therefore the 1954 International Convention for the Interference of Pollution of the Ocean by Oil.

Polar Code: In 2014, necessary regulative developments within the field of transport and trade facilitation enclosed the adoption of the International Code for Ships Operational in Polar Waters (Polar Code), expected to enter into force on one January 2017, yet as a spread of regulative developments concerning maritime and provide chain security and environmental problems.

However, many developments since UNCED, have targeted to the development of marine diversity among which the LOSC and therefore the CBD, are instrumental in changing State practice with reference to the protection of the marine environment at international level.

European Union

Europe's marine natural resources cover an enormous natural capital that supports economies, societies and individual well-being. Marine litter is widely recognized as a threat to marine ecosystems and a major societal challenge to manage. Under the EU Marine Strategy Framework Directive (MSFD) (Directive 2008/56/EC), marine litter is one of the eleven descriptors for determining Good Environmental Status, GES (Decision 2010/477/EU).¹⁵ Now, let's have a look over the different instruments operational in the EU Region concerning the cleaning of marine litter.

The Barcelona Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean, 1975: Under the Barcelona Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean, 1975, 16 Mediterranean countries and the European Community adopted the Mediterranean Action Plan (MAP), the first-ever Regional Seas Programme under UNEP's umbrella. The Convention's main objectives are:¹⁶

- to assess and control marine pollution
- to ensure sustainable management of natural marine and coastal resources;
- to integrate the environment in social and economic development;
- to protect the marine environment and coastal

zones through prevention and reduction of pollution, and as far as possible, elimination of pollution, whether land or sea-based;

- to protect the natural and cultural heritage;
- to strengthen solidarity among Mediterranean coastal States;
- to contribute to improvement of the quality of life.

The Bucharest Convention on the Protection of the Black Sea against Pollution, 1992: The Bucharest Convention on the Protection of the Black Sea against Pollution adopted in 1992. Under this, the Black Sea coastal States share a common desire for the sustainable management of the natural resources and biodiversity of the Black Sea and recognize their role and responsibility in conserving the global value of these resources with the principles and values as under-

- The principle of sustainability shall be applied such that there is a prudent and rational utilization of living resources and the preservation of the rights of future generations to a viable environment.
- The precautionary principle shall be applied, such that measures shall be taken when there are reasonable grounds for concern that any activity may increase the potential hazards to human health.
- The polluter pays principle shall be applied, such that the cost of preventing and eliminating pollution, including clean-up costs, shall be paid by the polluter.
- The principle of anticipatory action shall be applied, such that contingency planning, environmental impact assessment and strategic impact assessment shall be undertaken in the future development in the region.
- The principle of preventative action shall be applied, such that timely action shall be taken to alert the responsible and relevant authorities of likely impacts and to address the actual or potential causes of adverse impacts on the environment, before they occur.
- Environmental and health considerations shall be included into all relevant policies and sectoral plans and programmes, including, inter alia, urban planning, industrial development, fisheries, aquaculture and tourism.

- The principles of public participation and transparency shall be applied, such that all stakeholders, including communities, individuals and concerned organizations shall be given the opportunity to participate, at the appropriate level, in decision-making and management processes that affect the Black Sea.
- Public authorities shall widely disseminate information on the work proposed and undertaken to monitor, protect and improve the state of Black Sea.

Apart from the above, the EU Marine Strategy Framework Directive (MSFD) (Directive 2008/56/EC), marine litter is one among the eleven descriptors for determinant smart Environmental standing, GES (Decision 2010/477/EU). The EU aims to attain GES through the adoption of associate degree ecosystem-based and integrated approach to managing all human activities that impact the marine setting. At a general level, the policy framework for addressing marine litter is in situ at the EU level, notably through key directives like the MSFD, the Waste Framework Directive and the Landfill Directive etc. There are, however, clear barriers to progress, as well as incomplete and uneven implementation of EU policies across Member States, a requirement for larger ambition at the EU level.

North East Atlantic Marine Region: OSPAR Commission has shown important political temperament to act to require action on marine litter, and is within the method of developing a regional action arrange for marine litter.

Baltic Sea Region: HELCOM is active in observance and analysis activities, with attention on ship generated waste and port reception facilities, and a regional action arrange is being ready. important variations across the examined Member States (DE, SE, LT) were known in terms of political temperament, institutional frameworks and capability.

Mediterranean Sea Region: The Barcelona Convention features a history of commitment to marine litter, as well as a 2013 marine litter action arrange. The Member States have all shown some commitment to action on marine litter, however comprehensive measures are still in early stages and targets have however to be set.

Black Sea Region: The Bucharest Convention has no robust target in marine litter problems, neither among the Convention itself nor in its

MSFD-related activities. However, inadequate implementation, challenges in social control, few initiatives for property development and low social awareness limit progress on marine litter problems.

United States of America

In the USA, the legislative framework is as under¹⁷

The Act to Preevent Pollution from Ships (APPS): The APPS (33 U.S.C. §§1905-1915) implements the provisions of MARPOL 73/78, the International Convention for the bar of Pollution from Ships, 1973 as changed by the Protocol of 1978. ("MARPOL" is brief for marine pollution.) In 1987, APPS was amended by the Marine Plastic Pollution analysis and management Act. The MPPRCA needs Environmental Protection Agency and National Oceanic and Atmospherical Administration (NOAA), to review the consequences of improper disposal of plastics on the atmosphere and ways to cut back or eliminate such adverse effects. MPPRCA additionally needs Environmental Protection Agency, NOAA, and the U.S. Coast Guard (USCG) to judge the utilization of volunteer teams in watching floatable rubbish.

Marine Debris Reserach, Prevention, and Reduction Act (MDRPRA): The MDRPRA established programs among the National Oceanic and atmospherical Administration (NOAA) and therefore the u. s. Coast Guard (USCG) establish, confirm sources of, assess, reduce, and stop marine rubbish. MDRPRA additionally reactivates the Interagency Marine rubbish coordinating Committee, chaired by office.

Shore Protection Act (SPA): The SPA is applicable to transportation of municipal and industrial wastes in coastal waters. The SPA aims to attenuate rubbish from being deposited into coastal waters from inadequate waste handling procedures by waste transporting vessels. EPA, in consultation with the Coast Guard, is accountable for developing laws underneath the SPA.

Marine Protection, Research, and Sanctuaries Act (MPRSA): The MPRSA, additionally referred to as the Ocean marketing Act, typically prohibits:

- transportation of fabric from the u. s. for the aim of ocean dumping;
- transportation of fabric from anyplace for the aim of ocean marketing by U.S. agencies or

U.S.-flagged vessels; and

- dumping of fabric transported from outside the u. s. into the U.S. territorial ocean.

The Beach Act of 2000: The Act defines coastal recreation waters because the Great Lakes and marine coastal waters (including coastal estuaries) that states, territories, and tribes designate in their water quality standards to be used for swimming, bathing, surfing, or similar water contact activities.

India

In India, the following pieces of legislations are related to the protection of coastal health.

- Hazardous Waste Management & Handling Rules, 1989
- Forest (Conservation) Act, 1980
- Water (Prevention & Control of Pollution) Act, 1974
- Environmental Impact Assessment Notification, 1994
- Environment (Protection) Act, 1986
- Indian Wildlife (Protection) Act, 1972
- Biological Diversity Act, 2002.
- Indian Ports Act, 1908.
- Deep Sea Fishing Policy, 1991.
- Indian Fisheries Act, 1987.
- Coast Guard Act, 1978
- Maritime Zones (Regulation) of Fishing by Foreign Vessels Act, 1981

The Water (Prevention and Control of Pollution) Act, 1974: The Act of 1974 aims for the prevention and control of water pollution and the maintaining or restoring of wholesomeness of water for the establishment, with a view to carrying out the purposes aforesaid, of Boards for the prevention and control of water pollution, for conferring on and assigning to such Boards powers and functions relating thereto and for matters connected therewith.

The Environment (Protection) Act, 1986: The Act of 1986 aims to include

- to coordinate the role of government in relation to environmental protection and sustainable development;
- provide a mechanism for the development of

environmental policy and law;

- to promote a clean and healthy environment for all;
- to prevent, control, monitor and respond to pollution to facilitate sustainable development with respect to the management of the environment and natural resources;
- to facilitate the assessment and regulation of environmental impacts of certain activities;
- to promote the conservation and, where appropriate, sustainable use of biological diversity and the protection and conservation of natural resources, on the land, in air and in the sea;
- to reduce the production of wastes, and to promote the environmentally sound management and disposal of all wastes.

The Coastal Regulation Zone (CRZ) Notification, 2011: The sub-section (1) and clause (v) of sub-section (2) of section 3 of the Environment (Protection) Act, 1986 (29 of 1986), the Central Government, declare the coastal stretches of the country and the water area upto its territorial water limit, excluding the islands of Andaman and Nicobar and Lakshadweep and the marine areas surrounding these islands upto its territorial limit, as Coastal Regulation Zone (hereinafter referred to as the CRZ) with a view to-

- ensure livelihood security to the fisher communities and other local communities,
- living in the coastal areas, to conserve and protect coastal stretches, its unique environment and its marine area
- promote development through sustainable manner based on scientific principles taking into account the dangers of natural hazards in the coastal areas, sea level rise due to global warming,
- restricts the setting up and expansion of any industry, operations or processes and manufacture or handling or storage or disposal of hazardous substances as specified in the Hazardous Substances (Handling, Management and Transboundary Movement) Rules, 2009 in the aforesaid CRZ. Under the Act, the entire Coastal Regulation Zone was classified into different zones, i.e. CRZ-I,¹⁸ CRZ-II¹⁹, CRZ-III²⁰ and CRZ-IV²¹ based on ecological considerations and the extent of the development of human settlement (urban or rural).

The Coastal Regulation Zone (CRZ) Notification, 2018 (Draft): On the basis of the recommendations of Shailesh Nayak committee, the CRZ Notification 2018 has been framed. The followings are the main features of the Notification of 2018-

- Tourism infrastructure for basic amenities to be promoted: Temporary tourism facilities such as shacks, toilet blocks, change rooms, drinking water facilities etc. have now been permitted in Beaches. Such temporary tourism facilities are also now permissible in the "No Development Zone" (NDZ) of the CRZ-III areas as per the Notification. However, a minimum distance of 10 m from HTL should be maintained for setting up of such facilities.
- Only such projects/activities, which are located in the CRZ-I (Ecologically Sensitive Areas) and CRZ-IV (area covered between Low Tide Line and 12 Nautical Miles seaward) shall be dealt with for CRZ clearance by the Ministry of Environment, Forest and Climate Change. The powers for clearances with respect to CRZ-II and III have been delegated at the State level with necessary guidance.
- For islands close to the main land coast and for all Backwater Islands in the main land, in wake of space limitations and unique geography of such regions, bringing uniformity in treatment of such regions, NDZ of 20 m has been stipulated.
- All Ecologically Sensitive Areas have been accorded special importance: Specific guidelines related to their conservation and management plans have been drawn up as a part of the CRZ Notification.
- Pollution abatement has been accorded special focus: In order to address pollution in Coastal areas treatment facilities have been made permissible activities in CRZ-I B area subject to necessary safeguards.

Agreement Between the Netherlands and Boyan Slat²²

On 8th June, 2018, the Dutch Government entered into Associate in Nursing agreement with man. Boyan Slat the with reference to the readying of cleanup systems on the high seas. The agreement deals with matters like safety of navigation, protection of the marine atmosphere, and therefore the rights of different users of the high seas with

regard to our cleanup systems. Due to their novel nature, The Ocean Cleanup's systems haven't any clearly outlined standing underneath current international laws. though the systems formally qualify as ships underneath Dutch law, the standing of remote-controlled vessels has got to date not been expressly addressed in law, like the Law of the ocean Convention. By stepping into this agreement, The Ocean Cleanup demonstrates that it's determined to deploy its systems in line with international legislation and with respect for the atmosphere, maritime safety and different users of the high seas. As an evident part of their link with Holland, our systems can among different things be known with the Dutch flag.

Conclusion and Suggestions

To conclude, it may be said that today a significant level of concern has been created at the international level among different non- state entities (Cleanup Ocean, CleanSea etc.) excepting the Global and Regional Bodies like UN, EU etc. But unfortunately, due to non- co-operation; absence of co- ordinated approach between and among the states both at the regional and global level are creating problems in the mission of cleaning up of ocean. Hence the followings may be recommended to address environmental challenges, in general, and marine litter, additional specifically:²³

- Designing practices that are bold whereas acknowledging that ambition is relative counting on the national and regional political and socio-economic context.
- Making sure that watching and compliance mechanisms are in situ significantly as initiatives grow and become additional heterogeneous.
- Tempting the adoption of the relevant observe by a 'critical neutral mass' via the supply of not solely money however additionally social incentives, like recognition and possession.
- Acknowledging the important role of state within the success of voluntary practices through the supply of sound regulative frameworks, similarly as organisational and financial backing.
- Guaranteeing grade taking part in field among and across regions by supporting the event of additional and higher practices in regions that are presently lacking them.
- Implementation of the polluter pay principle

in connection with littering into the sea while voyage, transportation and fishing.

- There should be a comprehensive regulatory framework involving all the countries and non- state entities at the global end to tackle such pollution.
- There should be a detailed planning/ strategy and meticulous execution of the same.
- There should be adequate funding to continue the process including the expenses of to be incurred for R & D. Strengthen the company social responsibility framework by expressly recognizing the environmental due diligence principle encouraging firms to decide on less harmful choices by being created accountable for the merchandise style selections they create and their environmental consequences. Further, there should be setting up of proper waste management infrastructure at places.
- There should be strengthening of the corporate social responsibility framework by explicitly recognizing the environmental due diligence principle. The companies should be encouraged to choose less harmful options in manufacturing the consumer goods.
- The governments must strictly adhere to the CRZ regulations. Under no circumstances, the dumping of waste, emission of hazardous substances/contaminants to sea and oceans should be allowed. Further, inclusion of provisions addressing waste and litter problems, like the Water Framework Directive (e.g. introduction of a litter indicator, designation of plastics as a priority venturesome substance), the Waste Framework Directive, the Landfill Directive (e.g. tighter management of illegal landfills and dumping) in the existing legislations if any or introduction of the same as soon as possible by the National Governments.
- The govt. should completely ban the harmful use of consumer goods and promote the a governance-by-disclosure approach allowing societal actors to engage in fundamental discussion about responsible actors and the risks society is willing to take.
- Boosting the existing food/ecological contamination rules or framing of new legislation shaping most residue levels of microplastics contamination in fish and alternative food to reduce the environmental and human health risks.

- Each of the individual countries should take steps to clean up sea/ocean within their territorial boundaries.
- There should be a strong political will to foster increased and harmonic implementation of the policies with reference to marine litter by the Regional ocean Conventions. The EU may be a model in this regard.
- There should be a promotion of governance-by-disclosure approach permitting social actors to have interaction in elementary discussion concerning accountable actors and therefore the risks society is willing to require.
- Introducing of a ban on single-use plastic baggage and a taxing for multiple-use plastic baggage. Implement and enforce fine on littering to reinforce accountable national behaviour, as well as required participation in clean-up activities for bad person.

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 14. Available at <http://www.un.org/en/sections/issues-depth/oceans-and-law-sea/>, accessed on 11th December, 2018 at 10.45 PM.
 15. Available at <https://cordis.europa.eu/project/rcn/106632/reporting/en>, accessed on 06- 06-2019 at 2.50 PM.
 16. Available at http://ec.europa.eu/environment/marine/international-cooperation/regional-sea-conventions/barcelona-convention/index_en.htm, accessed on 24th May, 2019 at 4.02 PM.
 17. Available at <https://www.epa.gov/beach-tech/laws-protect-our-oceans>, accessed on 15th October, 2018 at 12.15 PM.
 18. No new construction shall be permitted in CRZ-I except projects relating to the Department of Atomic nergy and other major infrastructure projects such as, for example, pipelines, construction of trans-harbor sea link and roads, and the Green Field Airport (already permitted) at Navi Mumbai. Some minor projects such as the exploration and extraction of natural gas, and the construction of dispensaries, schools, public rain shelters, are permitted between the Low Tide Line and High Tide Line in areas which are not ecologically sensitive.
 19. CRZ-II includes the areas that have been developed up to or close to the shoreline. ' Activities and structures permitted in CRZ-II are, for example, the construction or reconstruction of buildings, facilities for receipt and storage of petroleum products, and notified ports
 20. CRZ-III includes those areas that are relatively undisturbed and do not fall under Category I or II. It also includes rural and urban areas that are not substantially developed. For these areas, the Notification establishes a 'No Development Zone' within the area up to 200 m from the HTL on the landward side in the case of seafront and 100 m along tidal influenced water bodies or width of the creek, whichever is less. In these areas, no construction shall be permitted except for the repair or reconstruction of existing authorised structures. However, the construction or reconstruction of dwelling units of traditional coastal communities (including fisherfolk) may also be permitted. This (qualified) general ban is followed, again, by anextensive list of activities which may be permitted in the 'No Development Zone'. Projects besides small-scale projects include, inter alia, agriculture, horticulture, gardens, projects relating to the Department of Atomic Energy, the mining of rare minerals, salt manufacture from seawater, and facilities for generating power by non-conventional energy sources, bridges, and roads
 21. CRZ-IV includes the water area from the Low TideLine to twelve nautical miles on the seaward side. It also includes the water area of the tidal influenced water body from the mouth of the water body where it meets the sea up to the influence of the tide. In CRZ-IV areas, activities impugning on the sea and tidal influenced water bodies no untreated sewage, effluents, ballast water, ship washes, as well as solidwaste from 'all activities' shall be let off or dumped. Coastal towns and cities are required to formulate sewage treatment plans and implement them within a period of one year. Traditional fishing rights of local communities shall not be restricted.
 22. Available at <https://www.theoceancleanup.com/updates/the-dutch-state-to-support-the-ocean-cleanups-high-seas-activities/>, accessed on 16th October, 2018 at 6.02 PM.
 23. Cleansea Report (Towards a Clean, Litter-Free European Marine Environment through Scientific Evidence, Innovative Tools and Good Governance), Available at https://cordis.europa.eu/result/rcn/189759_en.html, accessed on 16th October, 2018 at 08.03 PM.