
INTERNATIONAL WATERWAYS AND DUMPING OF WASTE IN THE SEAS/OCEAN: EFFECTS, RESPONSIBILITIES AND CHALLENGES UNDER INTERNATIONAL LAW

Livinus I. Nwokike*

Lecturer, Department of International Law and Jurisprudence, Faculty of Law, Nnamdi Azikiwe University, Awka, Anambra State, Nigeria

ABSTRACT: *International waterways depict the river, canal and other ways along which boats, ship can travel across countries. Dumping of wastes in the sea/ocean connotes the act or practice of dumping something especially dangerous substances at sea/ocean. Water pollution is one thing that has become common in contemporary industrial world. The dumping of wastes by known or unknown agents has given rise to many challenges at international arena. It is discovered that most developing nations discharge their untreated effluents into drainages, water ways or the nearest stream, lake or river thereby causing marine pollution and capsizing of ship. The role of international law at this point is therefore imperative to determine the effects, responsibility and culpability. This is the precis of this paper. On international dumping by other states, the law of sea requires states to adopt laws and regulations to prevent, reduce and control pollution of the marine environment by dumping. It is also recommended that serious fines and sanctions should be imposed at international level and measures undertaken by United Nations to implement the Law/treaty to that effect.*

KEYWORDS: International Waterways, Dumping, Waste, Sea/Ocean, Effect, Responsibility and International Law

INTRODUCTION

It is axiomatic to say that water is the source of life. However, most developing nations discharge their untreated effluent into drainages, water courses or the nearest stream, lake or river, thereby causing marine pollution.¹ Ocean pollution is the introduction by man directly or indirectly of substances or energy into the marine environment (including estuaries) resulting in such deleterious effects as harm to living resources, hazard to human health, hindrance to marine activities including fishing, impairment of quality for use of sea water and reduction of amenities.² But for a few cases, signs of water pollution arising from the unwholesome disposal

* **Livinus I. Nwokike**, OND, HND, PGD, MBA, FNIM. LLB (Hons), BL, LLM, Ph.D (candidate), Justice of Peace, Notary Public, Member, Nigerian Society of International Law, Member, International Law Association & Lecturer, Department of International Law and Jurisprudence, Faculty of Law, Nnamdi Azikiwe University, Awka, Anambra State, Nigeria, Email: li.nwokike@unizik.edu.ng, tolerancefocus@gmail.com, website: <http://www.geci.org.ng>. Phone Number: 08033521034, 09073018015

¹ C A Omaka, *Fundamental of Maritime, Admiralty and International Water Law*, (Lagos: Princeson & Associates Publishing Co. Ltd, 2018) 213

² L C Caflisch 'International Law and Ocean Pollution: The Present and the future available on line at <http://rbdi.brylant.be/public/modele/rbdi/content/files/RBDI%201972/RBD1%201972-1/Etudes/RBDI%201972.1%20pp.%207%20C3%A0%2033%20-%20Lucius%20Caflisch.pdf> accessed on 8th December, 2020. See also Comprehensive Outline of the Scope of the long-term and expanded programme of Oceanic Exploration and Research, as approved by the Intergovernmental Oceanographic Commission (I.O.C),

methods are not difficult to identify. Prima facie, the receiving waterways do not possess adequate assimilative capacity for the effluents; therefore, coloured rivers or streams can be seen in some parts of Delhi, Uttar Pradesh, Bangalore, Lagos, Aba, Kano, Ibadan, Onitsha, Kaduna and most urban cities. Some of these polluted watercourses emit obnoxious fumes. Some contain oil-like and real floating oil from sources of discharge. These conditions to say the least are aesthetically unsavoury to the eyes; and therefore unattractive for human recreation.³

A good number of people, especially those living in the coastal areas, rely significantly on fish consumption as the major source of animal protein. Fishes due to pollution of waterways are known to accumulate toxic metal pollutants in their organs. For example, the Japanese heavy metal poisoning caused by mercury (Hg) and Cadmium in the 1960s resulted in the notorious Minamata and Itai Itai disease. It should be recalled that in the Minamata bay mercury-poisoning episode in Japan, many people died after eating fish polluted with mercury. This was as a result of a plastic factory discharging its raw water containing mercury into Minamata bay. In the Itai Itai cadmium metal poisoning incident, many people suffered from brittle bone syndrome and died after eating rice from a field irrigated with water polluted with cadmium.⁴

In the United States, pesticides and PCB contamination of fish in the Upper Great Lakes, brought a flourishing commercial fishing industry to an abrupt halt in the 1970s. Good enough the results of studies carried out so far in the Nigeria indicate that although fish and shellfish are contaminated with toxic heavy metals such as mercury and cadmium, their concentration are far below those resulting in human death.⁵ Although this report is encouraging, yet more chemical effluents to our water channels might increase the concentration to a killing degree. It should also be noted that the effect is multifarious. For example, in the 1970s and early 1980s the ground waters of Niagara Falls were contaminated by toxic chemical resulting in high prevalence of spontaneous abortion in pregnant women. There were also severe birth defects and high incidence of cancer among the residents of Niagara. The entire community had to be evacuated and relocated. With the increasing number of industries and neglect by these industries to install waste treatment facilities, we may be heading for such unpleasant disasters.⁶

Efforts should be made by national and international governments to develop capacities to contend these to save aquatic and human lives from extinction.

Clarification of Terms

International waterways are the river, canal and other watercourses along which boats, ship can travel across the countries.

September, 1969 Part 1, 2 UNESCO/I.O.C., Summary Report of 6th Session, September - 13, 1969, Doc SC/MD 19 June 1, 1970, Annex iv, p. 12)

³ C A Omaka, op.cit

⁴ Ibid at 213

⁵ Report contained in the paper presented by Evans Aina, the Director General Federal Environmental Protection Agency, contained in FEPA Monograph 2

⁶ As reported in WHO International Standards for Drinking Water-Geneva 2013

Dumping is the act or practice of dumping something especially dangerous substances at sea/ocean.⁷

Waste is defined as unproductive, empty, rejected and superfluous.⁸ Materials become wastes when their owner will give them away or pay to have them hauled away. Healthcare wastes may also be viewed as an asset which may generate revenue through appropriate treatment and handling.⁹

Gilpin in his *Dictionary of Environmental Terms* defines waste as “materials of solid or semi solid character that possess or no longer considers of sufficient value to retain.” Therefore, a thing is a waste even if it may be a high value to another person, as long as the person generating it does not have sufficient interest to retain the thing. This definition is subjective and must be looked at from the point of view of the person possessing the objects.¹⁰

Sea/Ocean. Ocean is the mass of salt water that covers most of the earth surface; the depth of the ocean. One of the five large areas that the ocean is divided into: the Antarchi/Arctic/Atlantic/Indian/Racific Ocean.¹¹ Sea depicts the salt water that covers most of the earth’s surface, surrounds its continents and islands to travel the sea. Put in another way, sea, especially as part of a name means a large area of salt water that is part of an ocean or surrounded by land: the North Sea.¹²

Glacier is a large mass of ice, formed by snow on mountain that moves very slowly down a valley.¹³

Offshore means happening or existing in the sea, not far from the land while **Onshore** means happening on the land rather than at the sea.¹⁴

International Law is defined as the legal system governing the relationship between countries more modernly, the law of international relations, embracing not only countries, but also such participants as international organizations and individuals (such as those who involve their human rights or commit war crimes). Also termed public international, law of nations, law of nature and nations; jus gentium, jus gentium publicum, jus intergentes; foreign relations law; interstate law; law between states.¹⁵

Sources of Water Pollution

These problem areas have already been pointed out, yet it is pertinent to streamline the major contributors to water pollution. To say the least, the natural location of people is gradually

⁷ A S Hornby, *Oxford Advanced Learner’s Dictionary of Current English* (Oxford: 9th ed., Oxford University Press, 2015) 478

⁸ S Oliver, ‘Waste management and disposal, in purchasing and supply management’, (1991), 22-24

⁹ C G Gumerson and D C Jones, ‘Costing and cost recovery for waste disposal and recycling, Discussion Paper Report No UDB-37, Waste supply and urban Development Department, Operation Policy Staff, The World Bank (1984), 33

¹⁰ M Purdue, ‘Defining Waste’, *Journal of Environmental Law* 1990, Vol. 2

¹¹ Op.cit, 1065

¹² Ibid at p. 1393

¹³ Ibid at p. 662

¹⁴ Ibid at pp 1070 & 1077

¹⁵ B A Garner, *Black’s Law Dictionary*, (United States of America: 10th ed., THOMSON REUTERS, 2014) 641

being destroyed due to the influence of modernization and development. This result is the elimination of wildlife, forest reserves, marine life, flora and fauna.

Sewage Wastes: The most ravaging in domestic water pollution are those incidental to the use of water in diluting the carrying-off of sewage in the villages. This sewage pollution in rural areas poses serious danger and is the major cause of intestinal diseases.¹⁶

Industrial Wastes: This is also a major harbinger of pollution of water courses and rivers. The ugly leftovers of industrialization are resultant discharge of toxic industrial effects in water channels especially in urban neighbourhoods.

Chemical Effluents: The chemical industry is a major contributor to the poor state of our environment. For example, household detergents and insecticides, which ultimately find their way into streams by the process of surface run-off and rill erosion. According to investigation reports, in 2014 noxious chemical wastes, dyes and other trade effluents grossly polluted eight wells examined to the extent that they were rendered unusable in Lagos Nigeria.¹⁷

The Agricultural Sector Source: In Nigeria farmers use Gamalian 20 for spraying of cocoa and other cash crop trees, which finally drain to the streams. Also, the Federal Government Agricultural Policies like Operation-Feed-the-Nation” (OFN),¹⁸ Green-Revolution¹⁹ and Food-For-All by the Year 2,000²⁰ became opportunities for high-powered, chemical, insecticide, pesticide, weedicide and fertilizer abuses. Overwhelming evidence disclosed that DDT and other related chlorinated hydrocarbons used as pesticides and herbicides threaten many species of flora and marine Life. These chemical compounds when dangerously concentrated, progressively accumulate in land and sea animals moving up the food chain. The effect has led to a ban of the use of DDT by many countries.²¹

1. Oil and Gas Discharges: The case of dangerous liquids like oil, gas and other petroleum products that escape out of pipelines, especially in the Niger Delta should not be over emphasized. These oil and gas spillages eventually find their way to water courses killing fishes and other marine life; and making the water unfit for human consumption and unsafe for agriculture. A case in point is the 1980 leakage of petroleum in the Niger Delta. It was reported²² that an oilrig belonging to Texaco Overseas (Nig) Ltd burst and made a grave devastating damage.

INSTITUTIONAL/LEGAL/STATUTORY FRAMEWORKS

The Helsinki Rules

The Helsinki Rules on the Uses of the Waters of International Rivers are applicable to all drainage basins that cross national boundaries. The Helsinki Rules confers the rights of all littoral nations to an equitable share and joint use of water resources, with consideration of past customary usages of the resource and balancing variant needs and demands of the bordering

¹⁶ Op.cit

¹⁷ New Nigeria newspaper, June 4 2014

¹⁸ Agricultural policy of the regime of General Olusegun Obasanjo (1976-1979)

¹⁹ Agricultural policy of the regime of President Shehu Shagari (1979-1983)

²⁰ Agricultural policy of the regime of General Ibrahim Babangida (1985-1993)

²¹ D A Ijalaye on Environmental Law in Nigeria seminar organized by the Federal Ministry of Housing and Environment on October 13-14 1992

²² Punch Newspaper, March 8, 1980 p.6

nations, save where other agreement between bordering nations exists. The Rules mandates protection of the resource by littoral states with respect to water pollution and provides recommendations for resolving disputes over usage of such watercourses.²³

Convention on the Law of Non-Navigational Uses of International Watercourses

In May 21, 1997, the United Nations General Assembly adopted this Convention. However, the Convention on the Law of Non-Navigational Uses of International Watercourses came into force seventeen years after, precisely, August 17 2014. The Convention is an instrument pertaining to the uses and conservation of all waters that cross international boundaries, including both ground and surface waters. The document was essentially drafted by the UN recognizing the increasing demands for water and its impact on human the human system and the environment. It was also enacted to help conserve and manage water resources sustainably for present and future generation.²⁴ Though many countries have not ratified the document, is regarded as an important step towards arriving at wholesome international law governing water.²⁵ In autumn of 2008, the UN began reviewing law proposed by the ILC to serve similar purpose and adopting same into law.²⁶ This Convention is further discussed in the chapter on *Maritime Boundary Treaties* in this book.

The Hague Rules²⁷

According to The Hague Rules,²⁸ water is under threat from man's unsustainable use, through pollution, land use abuse and other changes, climate change and among other threats. The relationship between these threats and global poverty are not farfetched. There is, a huge diversity of needs and situations around the world. Hence, there is a common agenda to provide water security in the 21st Century and beyond. If this must be achieved, The Hague Rules enjoins all to ensure that that freshwater, coastal and related ecosystems are protected, maintained and improved; including the maintenance of sustainable development and political stability; and all humanity should have access to enough safe water at an affordable cost to lead a healthy and productive life. The Rules also advocates that the vulnerable, especially in developing countries are protected from the risks of water related hazards and challenges.

United Nations Convention on the Law of the Sea (UNCLOS) 1982 UNCLOS 1982:

Similarly, on the 10th day of December 1982 at Montego Bay, Caracas Venezuela there was an International Conference on Law of the Seas. This gave rise to the enactment of the United Nations Convention on the Law of the Sea in 1982. The purpose of the treaty among other

²³ See The Helsinki Rules on the Uses of the Waters of International Rivers, UNESCO retrieved from "http://en.wikipedia.org/wiki/The_Helsinki_Rules_on_the_Uses_of_the_Waters_of_International_Rivers" "Categories: International Law/Water law retrieved on 2 February 2010

²⁴ "Column 1255W – continued." United Kingdom Parliament. 2007-12-05. <http://www.publications.parliament.uk/pa/cm200708/cmhansrd/com071205/text/7120w0012.htm>. Retrieved 2007-02-12

²⁵ Raj, Krishna; Salman, M A Salman, International Groundwater Law and the World Bank Policy for Projects on Transboundary Groundwater in Salman, M A Salman, Groundwater, Legal and Policy Perspectives: Proceedings of a World Bank Seminar (World Bank Publications: 1999, New York) 171-172

²⁶ Brahic, Catherine. "Can legislation stop the wells running dry?". *New Scientist* (2681). <http://www.newscientist.com/Article/mg20026S14.000-can-legislation-stop-the-wells-running-dry.html?full=true>. Retrieved 2 December 2010

²⁷ Agreed to on Wednesday 22 March 2000, in The Hague, The Netherlands. It is otherwise referred to as the Ministerial Declaration of the Hague on Water Security in the 21st Century100000

²⁸ Declaration 1

things includes; control of pollution in the marine environment. In particular, Sections 1 and 2 of Article 207 of the treaty provides as follows:

(1) States shall adopt laws and regulations to prevent, reduce and control pollution of the, marine environment from land-based sources, including rivers, estuaries, pipelines and out fall structures, taking into account internationally agreed rules, standards and recommended practices and procedures.

(2) States shall take other measures as may be necessary to prevent, reduce and control pollution of the marine environment from land based sources.

The United Nations is working to ensure the peaceful, cooperative, legally defined uses of the seas and oceans for the individual and common benefit of humankind. Urgent calls for an effective international regime over the seabed and the ocean floor beyond a clearly defined national jurisdiction set in motion a process that spanned 15 years and saw the creation of the United Nations Seabed Committee, the signing of a treaty banning nuclear weapons on the seabed, the adoption of the General Assembly's declaration that all seabed resources beyond the limits of national jurisdiction are the common heritage of mankind, and the convening of the Stockholm Conference on the Human Environment.

The convention has resolved several 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)

The United Nations Environment Programme (UN Environment), particularly through its Regional Seas Programme, acts to protect oceans and seas and promote the sustainable 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 link between terrestrial, freshwater, coastal and marine ecosystems.²⁹

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. The International Maritime Organization (IMO) is the key United Nations institution for the development of international maritime law. its main task is to create a fair and effective, generally accepted and implemented legal framework for the shipping industry.³⁰

Marine Shipping and Pollution

²⁹ UNEP, Ocean and the Law of the Sea available on line at <https://www.un.org/en/sections/issues-depth/oceans-and-law-sea/> accessed on 8/12/20

³⁰ Ibid

To ensure that shipping is cleaner and greener, IMO has adopted regulations to address the emission of air pollutants from ships and has adopted binding energy-efficiency measures to reduce greenhouse gas emissions from, international shipping; These include the landmark International Convention for the Prevention of Pollution from Ships of 1973, as modified by a 1978 Protocol (MARPOL), and the 1954 International Convention for the Prevention of Pollution of the Sea by Oil.

Polar Code

In 2017, the International Code for Ships Operating in Polar Waters (Polar Code) entered into force. The Polar Code covers the full range of design, construction, equipment, operational, training, search and rescue and environmental protection matters relevant to ships operating in the inhospitable waters surrounding the two poles. It was an important regulatory development in the field of transport and trade facilitation, alongside a range of regulatory developments relating to maritime and supply chain security and environmental issues.

The 1972 London Convention

The main provisions of the 1972 London Convention can be summarized as follows:

- (a) A definition of "dumping" to cover the deliberate disposal of waste and other matter at sea from ships, aircraft, platforms or other man-made structures in the sea;
- (b) A ban on dumping at sea of any of the substances on the "black list" (Annex I to the Convention): toxic organohalogen compounds, agreed carcinogenic substances, mercury and cadmium and their compounds, crude oil and petroleum products³¹ taken on board for the purpose of dumping them, high-level radioactive substances as defined by the International Atomic Energy Agency and persistent synthetic substances (including plastics) liable to float or remain in suspension. Exceptions were allowed for *force majeure* and for trace amounts not added for disposal purposes;
- (c) A requirement for a special prior permit for any dumping of any substances on the "grey list" (Annex II to the Convention) - arsenic, lead, copper and zinc and their compounds, organosilicon compounds, cyanides, fluorides and pesticides not in Annex 1, bulky objects and tar likely to obstruct fishing or navigation, medium-level and low-level radioactive waste and substances to be dumped in such quantities as to cause harm;
- (d) A requirement for at least a general prior permit for all other dumping. Such permits were required to follow an approach set out in Annex 111 to the Convention, which required consideration of alternative land-based disposal and the avoidance of harm to legitimate uses of the sea;
- (e) A requirement to appraise the effectiveness of the regulatory assessment process through compliance monitoring and field monitoring of effects;
- (f) An obligation to report to the Secretariat of the Convention (which is hosted by the International Maritime Organization (IMO) in London) on dumping permits issued and amounts permitted to be dumped (IGC, 1982; LC-LP, 2014a).

When the 1972 London Convention entered into force in 1975, dumping at sea was still a major disposal route for many kinds of waste. Over the years, the meetings of the Contracting Parties have tightened the requirements of the Convention, with the result that the amounts of waste that may be dumped were reduced significantly:

³¹ "Petroleum products" includes wastes from crude oil, refined petroleum products, petroleum distillate products, and any mixtures containing these substances

(a) Guidance was adopted on the approaches to the grant of special and general permits for dumping. In many respects this guidance was gradually made more precise and restrictive (IMO, 2014a);

(b) In 1972 incineration of hazardous waste at sea was just beginning to be practised. In 1978 an amendment was adopted clarifying that the incineration at sea of oily wastes and organohalogen compounds was permitted as an interim solution, but requiring a special prior permit in accordance with agreed guidelines for this practice. This amendment came into force in 1979 (IGC, 1982). In 1988, the Consultative Meeting of the States parties called for such incineration to be minimized and for a re-evaluation of the practice (LDC, 1988). In 1993 an amendment to prohibit this practice was adopted and entered into force from 1994 (IMO, 2012);

(c) In 1990, the Contracting Parties adopted a resolution calling for the phasing out of the dumping of industrial waste (LDC, 43(13)). Following this, an amendment to Annex I of the Convention was adopted in 1993, which entered into force in 1994, to prohibit the dumping of industrial waste from the end of 1995 (IMO, 2012; IMO, 2014c).

(d) Even though the 1972 London Convention, as adopted, prohibited the dumping of high-level radioactive waste, many Contracting Parties remained unhappy with any dumping of radioactive waste of any kind. In 1983, a voluntary moratorium on such dumping was agreed. In 1993 an amendment was adopted to prohibit all dumping of radioactive waste, subject to a review before February 2019, and every twenty-five years thereafter. The Consultative Meeting of the Contracting Parties is beginning preparations for this review (IMO, 2012; LC-LP, 2014).

The 1996 London Protocol³²

The generally restrictive policy of the Contracting Parties to the 1972 London Convention towards the dumping of waste and other matter at sea resulted in a further development in 1996, when a protocol to the convention was adopted. This Protocol is intended gradually to replace the 1972 London Convention. The London Protocol entered into force in 2006. Among a number of other changes, the fundamental difference between the 1972 Convention and the 1996 London Protocol is that the Protocol adopts a "reverse list" approach. All dumping of waste is prohibited, except for a limited number of categories where dumping could be permitted, in contrast to the 1972 Convention approach, which prohibited dumping only of a specified list of substances, while requiring a permit (general or special) for everything else. The limited number of categories where dumping can still be permitted under the Protocol as originally adopted are:

- (a) Dredged material;
- (b) Sewage sludge;
- (c) Fish waste, or material resulting from industrial fish processing operations;
- (d) Vessels and platforms or other man-made structures at sea;
- (e) Inert, inorganic geological material;
- (f) Organic material of natural origin;
- (g) Bulky items primarily comprising iron, steel, concrete and similar unarmful materials for which the concern is physical impact and limited to those circumstances, where

³² 36 international Legal Materials 1 (1997)

such wastes are generated at locations, such as small islands with isolated communities, having no practicable access to disposal options other than dumping.³³

(h)

Shortly after the Protocol entered into force in 2006, the Meeting of Contracting Parties to the London Protocol adopted an amendment to add "sub-seabed carbon-dioxide (CO₂) streams from CO₂ capture processes for sequestration" to the list of permitted forms of disposal (LP.I(1)). States Parties may therefore issue permits to allow the injection into a sub-seabed geological formation of CO₂ streams from CO₂ capture processes. This amendment entered into force in 2007. In 2012, specific guidelines were adopted for such disposal activities and the potential effects on the marine environment in the proximity of the receiving formations. In 2009, a further amendment was adopted, allowing the export of CO₂ from CO₂ capture processes for sequestration in sub-seabed geological formations (LP.3(4)). This amendment is not yet in force. Guidance on the implementation of the export of CO₂ streams for disposal in sub-seabed geological formations for the purposes of sequestration was adopted in 2013. The intention of carbon dioxide sequestration in sub-seabed geological formations is to prevent release into the biosphere of substantial quantities of carbon dioxide derived from human activities, by retaining the carbon dioxide permanently within such geological formations.³⁴

In 2008, the Contracting States to both the 1972 London Convention and the 1996 London Protocol adopted a resolution agreeing that the scope of the London Convention and Protocol includes ocean fertilization activities, that is, any activity undertaken by humans with the principal intention of stimulating primary productivity in the oceans. (Ocean fertilization does not include ordinary aquaculture, or mariculture, or the creation of artificial reefs). It was further agreed that:

- (a) In order to provide for legitimate scientific research, such research should be regarded as placement of matter for a purpose other than the mere disposal thereof under Article III.1(b) (ii) of the London Convention and Article 1.4.2.2 of the London Protocol;
- (b) Scientific research proposals should be assessed on a case-by-case basis using an assessment framework to be developed by the Scientific Groups under the London Convention and Protocol;
- (c) Such an assessment framework should include, *inter alia*, tools for determining whether the proposed activity is contrary to the aims of the Convention and Protocol;
- (d) Until specific guidance is available, Contracting Parties should be urged to use utmost caution and the best available guidance to evaluate the scientific research proposals to ensure protection of the marine environment consistent with the Convention and Protocol;
- (e) For the purposes of the resolution, legitimate scientific research should be defined as those proposals that have been assessed and found acceptable under the assessment framework;
- (f) Given the present state of knowledge, ocean fertilization activities other than legitimate scientific research should not be allowed. To this end, such other activities should be considered as contrary to the aims of the Convention and Protocol and should not currently qualify for any exemption from the definition of dumping in the Convention and the Protocol (LC-LP, 2008).

In 2010, the Contracting Parties to the 1972 London Convention and the 1996 London Protocol adopted the Assessment Framework for Scientific Research Involving Ocean Fertilization (LC-

³³ See A Simcock & J Wang Solid Waste dispoint the regulating system available on line at https://www.un.org/Depts/Los/global_reporting/WDA_RPROC/Chapter_24.pdf accessed on 8/12/20.

³⁴ Ibid at p 4

LP, 2010). In 2013, the Contracting Parties to the London Protocol adopted amendments to incorporate into the Protocol provisions regulating the placement of matter for ocean fertilization and other marine geo-engineering activities (LP.4(8)). These amendments are not yet in force (LC-LP, 2013). Guidance on implementing the provisions was adopted in 2014(LC-LP,2014).³⁵

Sea/Ocean Level Rise and the Causes

Sea level is the average height of the sea/ocean used as the basis for measuring the height of all places on land.³⁶ Rise means an increase in an amount: a number or a level. Impliedly, sea level rise is an increase in an amount in the average height of the sea/ocean used as the basis for measuring the height of all places on land. To make better predictions about the future impacts of sea level rise, new techniques are being developed to fill gaps in the historic record of sea level measurements. We know the factors that play a role in sea level rise: melting glaciers and ice sheets add water to the sea and warmer temperatures cause water to expand. Other factors are known to show the rise, such as dams impounding water on the land stymying its flow into the sea.³⁷

When each factor is added together, this estimate should match the sea level that scientists observe. Until now, however, the sea level “budget” has fallen short of the observed sea level rise, leading to scientists to question why the budget wouldn’t balance.³⁸ On reexamining each of the known contributors to sea level rise from 1900 to 2018, the research, led by NASA’s Jet Propulsion Laboratory in southern California, uses improved estimates and applies satellite data to better understand historic measurements.³⁹ It was found that estimates of global sea level variations based on tide gauge observations had slightly overestimated global sea levels before the 1970s. They also found that mountain glacier meltwater was adding more water to the oceans than previously realized but that the relative contribution of glaciers to sea level rise is slowly decreasing. And they discovered that the relative contribution of glaciers to sea level rise is slowly decreasing. And they discovered that glacier and Greenland ice sheet mass loss explain the increased rate of sea level rise before 1940.⁴⁰

In addition, the new study found that during the 1970s, when dam construction was at its peak, sea level rise slowed to a crawl. Dams create reservoirs that can impound freshwater that would normally flow straight into the sea.

“That was one of the biggest surprises for me”, said lead researcher Thomas Frederikse, a postdoctoral fellow at JPL, referring to the peak in global dam projects at that time. “We impounded so much freshwater, humanity nearly brought sea level rise to a halt.”

Since the 1990s, however, Greenland and Antarctic ice sheet mass loss and thermal expansion have accelerated sea level rise, while freshwater impoundment has decreased. As our climate continues to warm, the majority of this thermal energy is absorbed by the oceans, causing the

³⁵ Ibid at p 5

³⁶ A S Hornby op.cit at 1395

³⁷ NASA – National Aeronautics and Space Administration Study available on lien at <https://climate.nasa.gov/news/3012/nasa-ledstudy-reveals-the-causes-of-sea-level-rise-since1900/> accessed 10/12/20

³⁸ Ibid

³⁹ NASA Jet Propulsion Laboratory, Southern California

⁴⁰ Ibid at p 2

volume of the water to expand. In fact, ice sheet melt and thermal expansion now account for about two-thirds of observed global mean sea level rise. Mountain glacier meltwater currently contributes another 20%, while declining freshwater water storage on land adds the remaining 10%.

All told, sea levels have risen on average 1.6 millimeters (0.063 inches) per year between 1900 and 2018. In fact, sea levels are rising at a faster rate than at any time in the 20th century. But previous estimates of the mass of melting ice and thermal expansion of the ocean fell short of explaining this rate, particularly before the era of precise satellite observations of the world's oceans, creating a deficit in the historic sea level budget.

Whose Fault is plastic waste in the Ocean?

Rich countries with good recycling infrastructure hold Southeast Asia responsible for plastic waste polluting the sea. A facet-check shows that's not fair.

It's an instinct we reach for when told we've messed up blame. But when it comes to plastics that sully oceans – killing fish and potentially poisoning food chains – it's hard to say where we should point fingers.

Richer countries tend to waste more plastic than poorer ones. Germans and Americans throw away more than 10 times as much plastic a day as Kenyans and Indians. Europe, North America, Japan and Australia have shipped so much to Southeast Asia for recycling that, overwhelmed waste, Malaysia and Vietnam decided this year to ban plastic waste imports. China had already done so in 2018.

But the few studies to estimate ocean plastic pollution suggest a handful of Asian countries are disproportionately responsible. Most ocean plastic comes from 10 rivers in Asia and Africa.⁴¹ Another study posited that mismanaged plastic waste – the sort likely to land in oceans – would barely decrease if Europe and North America cut out all plastic.⁴² So, whose fault is ocean plastic?

CONCLUSION

Facts are undisputed that water is a necessity to the lives of human beings, animals and plants. Aquatic animals depend on water for their metabolic process. However, the quest for human development and industrialization have led to the abuse of water and water courses. International waterways being the media for the movement and transportation of humans, goods and services from one country, countries and continents to another have been abused, hindered and polluted by both known and unknown sources. The effects of the dumping of these pollutants be it solid, liquid or gaseous wastes have resulted to negative changes in the water and the sea/ocean such as rise in sea level. These gave rise to challenge in the management of marine environment. Determining the level of responsibility gave rise to tracing the causes and sources of these wastes from one state to the other and at international arena. State(s) found to be culpable are brought under both states and international tribunals,

⁴¹ Helmholtz Center for Environmental Research available on line at <http://www.dw.com/en/whose-fault-is-plastic-waste-in-the-ocean/a49745660#:~:text=But%20the%20few%20studies%20to,rivers%20in%20Asia%20and%20Africa> accessed on 8th December, 2020

⁴² See Jambeck Research Group at the University of Georgia available online at <http://www.dw.com/en/whose-fault-is-plastic-waste-in-the-ocean/a49745660#:~:text=But%20the%20few%20studies%20to,rivers%20in%20Asia%20and%20Africa> accessed on 8/12/20

convention and courts; as these tribunals, convention and courts were created due to crimes that will be committed and are committed in the abuse of these waterways.

Recommendations

Sequel to this conclusion, we recommend that appropriate modern methods should be adopted by states identified to be the causes and sources of the wastes and pollutants in the waterways to sort, collect, transport, treat and manage them for sustainable development. Thus, some of these wastes (solid waste) can be recycled effectively and treated before discharging them into the sea/ocean. This approach will reduce their quantities thereby reducing the consequence of leading to sea level rise. Punitive measures and sanctions should be melted on the identified offenders. Developed and developing countries should seek better countries that have better recycling equipment to assist them pulverize and recycle their plastic and solid wastes. We recommend the use of robots and artificial intelligence in these regards for efficient and effective sorting and management.