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ADRIANA ISABELLE BARBOSA SÁ LEITÃO DI PASQUALE

**THE DEVELOPMENT OF THE GLOBAL GOVERNANCE FOR MARINE
PLASTIC POLLUTION: FULFILLING LEGAL GAPS TO FACE THE OCEAN
EMERGENCY?**

FORTALEZA – CEARÁ

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Advisor: Prof. Dr. Leonardo Pasquali.

Co-Advisor: Prof. Dr. Tarin Cristino Frota
Mont'Alverne.

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EXAMINING BOARD

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University of Pisa

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To the divine energy that guides and accompanies me
To my loving parents, supportive husband and caring friends
“(...) que, por ter(em) gostado muito de mim, me deu(ram) confiança pra viver, me deu(ram) segurança para me exhibir. Não tive medo de ser ridícula, não tenho medo de morrer. Porque fui(e sou) amada.”

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Such an accomplishment could never be achieved alone, and I am profoundly thankful to everyone who has supported me along the way. I dedicate this project to my family and my husband.

My deepest thanks go to my parents, Joaquim and Rosana, and my uncles, Ana and Bruno. The ache of missing you has shown me that family's bond knows no borders. Thank you for your unwavering encouragement, belief in me, and your love and support.

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Though being far away from loved ones has been difficult, it has been worth it. I hope this work can, in some small way, contribute to the preservation of our great and beautiful ocean.

And to anyone who might stumble upon this research, I hope it offers something meaningful – whether a new perspective, a point of reflection, or a helpful reference. If you are in the midst of your own academic journey, remember that the process can be as valuable as the end result. I know it might not be easy but trust your way – even when it feels uncertain.

“Foi então que compreendi que só em mim havia morte e que tudo estava profundamente vivo. Só então vi as folhas caindo, os rios correndo, os troncos pulsando, as flores se erguendo e ouvi os gemidos dos galhos tremendo, dos gineceus se abrindo, das borboletas noivas se finando e tão grande foi a minha dor que angustiosamente abracei a terra como se quisesse fecundá-la. Mas ela me lançou fora como se não houvesse força em mim e como se ela não me desejasse. E eu me vi só, nu e só, e era como se a traição tivesse me envelhecido eras.”

Vicinius de Moraes
Ariana, a mulher (1936)

ABSTRACT

This doctoral thesis explores how international, regional and national policies can address the escalating challenges of marine plastic pollution. Plastic, as a specific type of waste, causes numerous negative externalities, especially in fragile ecosystems like the marine environment. These challenges stem from inefficiencies and objective difficulties in the production, disposal, and recycling phases. As plastic production, consumption, and discharge continue to rise, so does the urgent need for a comprehensive global treaty that effectively addresses the transboundary nature of plastic pollution. Current regulatory efforts have primarily focused on waste management, but these measures fall short of achieving the systemic and societal changes necessary. In March 2022, nations agreed to a mandate to begin negotiations on a treaty aimed at eliminating plastic pollution, with negotiations still underway at the time of this discussion. Written amid these ongoing debates, this thesis provides a dual analysis, exploring two key phases in the evolution of global (marine) plastic pollution governance. To ensure maximum effectiveness and impact, it is crucial to address governance gaps across the entire life cycle of plastics and related chemicals. This is done by assessing existing measures and efforts, highlighting areas that could be strengthened within the framework of relevant treaties. The international community has proposed various solutions, but none appear capable of delivering the benefits and innovations that a new treaty could offer. Following this, the thesis investigates the power dynamics and relationships influencing the plastic treaty negotiations, examining the roles and impact of key actors in the decision-making process. Acknowledging that global agreements must be translated into concrete actions at national and local levels and must establish synergies and coordination with other existing instruments and agendas, the research supports the adoption of holistic approaches. These approaches should not only focus on the entire life cycle of plastics but also consider the broader complexities of the issue, which intersects with the ocean agenda, the climate agenda, and other critical environmental concerns. By integrating insights from these analyses, this thesis provides a comprehensive understanding of the complexities of global plastic governance and offers strategies for orchestrating a treaty that harmonizes different perspectives on (marine) plastic pollution, eliminating the risks of inconsistency or conflicts by identifying possibilities for collaboration in the event that mandates overlap. As a methodology, the research involved the implementation of a qualitative method with an exploratory nature, consisting of a review of scientific and legal literature and a critical analysis of international legislation. The findings contribute to advancing international environmental governance research and provide practical recommendations for crafting a global treaty that meets the urgency and scale of the plastic pollution crisis, while promoting a more integrated approach to tackling interconnected environmental challenges.

Keywords: Marine Plastic Pollution. Global Governance. Ocean Emergency.

RIASSUNTO

Questa tesi di dottorato esplora come le politiche internazionali, regionali e nazionali possano affrontare le crescenti sfide dell'inquinamento marino da plastica. La plastica, come tipo specifico di rifiuto, causa numerose esternalità negative, soprattutto in ecosistemi fragili come l'ambiente marino. Queste sfide derivano da inefficienze e difficoltà oggettive nelle fasi di produzione, smaltimento e riciclaggio. Mentre la produzione, il consumo e lo scarico di plastica continuano ad aumentare, aumenta anche l'urgente necessità di un trattato globale onnicomprensivo che affronti efficacemente la natura transfrontaliera dell'inquinamento da plastica. Gli attuali sforzi normativi si sono concentrati principalmente sulla gestione dei rifiuti, ma queste misure non riescono a realizzare i cambiamenti sistemici e sociali necessari. A marzo 2022, gli Stati hanno concordato un mandato per avviare i negoziati su un trattato volto a eliminare l'inquinamento da plastica. I suddetti negoziati sono ancora in corso al momento di questa discussione. Redatta durante lo svolgimento di questi dibattiti, questa tesi fornisce un'analisi duale, esplorando due fasi chiave nell'evoluzione della governance globale dell'inquinamento (marino) da plastica. Per garantire la massima efficacia e impatto, è fondamentale colmare le lacune di governance nell'intero ciclo di vita della plastica e delle sostanze chimiche correlate. A tal fine, è necessario valutare le misure e gli sforzi esistenti, evidenziando le aree che potrebbero essere rafforzate nel quadro dei trattati pertinenti. La comunità internazionale ha proposto varie soluzioni, ma nessuna sembra in grado di fornire i benefici e le innovazioni che un nuovo trattato potrebbe offrire. In seguito, la tesi indaga le dinamiche di potere e le relazioni che influenzano i negoziati del trattato sulla plastica, esaminando i ruoli e l'impatto degli attori chiave nel processo decisionale. Riconoscendo che gli accordi globali devono essere tradotti in azioni concrete a livello nazionale e locale e devono stabilire sinergie e coordinamento con altri strumenti e programmi esistenti, in questo lavoro si sostiene la necessità dell'adozione di approcci olistici. Questi approcci non dovrebbero solo concentrarsi sull'intero ciclo di vita della plastica, ma anche considerare le più ampie complessità della questione, che si interseca con l'agenda oceanica, l'agenda climatica e altre preoccupazioni ambientali critiche. Integrando i risultati di queste analisi, questa tesi fornisce una comprensione completa delle complessità della governance globale della plastica e offre strategie per orchestrare un trattato che armonizzi diverse prospettive sull'inquinamento (marino) da plastica, eliminando i rischi di incoerenza o conflitti identificando possibilità di collaborazione nel caso in cui i mandati si sovrappongano. Come metodologia, la ricerca ha comportato l'implementazione di un metodo qualitativo di natura esplorativa, costituito da una revisione della letteratura scientifica e giuridica e da un'analisi critica della legislazione internazionale. I risultati contribuiscono a far progredire la ricerca sulla governance ambientale internazionale e forniscono raccomandazioni pratiche per elaborare un trattato globale che soddisfi l'urgenza e la portata della crisi dell'inquinamento da plastica, promuovendo al contempo un approccio più integrato per affrontare le sfide ambientali interconnesse.

Parole chiave: Inquinamento Marino da Plastica. Governance Globale. Emergenza Oceanica.

RESUMO

Esta tese de doutorado explora como as políticas internacionais, regionais e nacionais podem abordar os crescentes desafios da poluição marinha por plásticos. O plástico, como um tipo específico de resíduo, causa inúmeras externalidades negativas, especialmente em ecossistemas frágeis como o ambiente marinho. Esses desafios decorrem de ineficiências e dificuldades objetivas nas fases de produção, descarte e reciclagem. À medida que a produção, o consumo e o descarte de plástico continuam a aumentar, também aumenta a necessidade urgente de um tratado global abrangente que aborde efetivamente a natureza transfronteiriça da poluição por plásticos. Os esforços regulatórios atuais têm se concentrado principalmente na gestão de resíduos, mas essas medidas não conseguem alcançar as mudanças sistêmicas e sociais necessárias. Em março de 2022, as nações concordaram com um mandato para iniciar negociações sobre um tratado que visa eliminar a poluição por plásticos, com negociações ainda em andamento no momento desta discussão. Escrita em meio a esses debates em andamento, esta tese fornece uma análise dupla, explorando duas fases principais na evolução da governança global da poluição (marinha) por plásticos. Para garantir a máxima eficácia e impacto, é crucial abordar as lacunas de governança em todo o ciclo de vida dos plásticos e produtos químicos relacionados. Isso é feito avaliando medidas e esforços existentes, destacando áreas que poderiam ser fortalecidas dentro da estrutura de tratados relevantes. A comunidade internacional propôs várias soluções, mas nenhuma parece capaz de fornecer os benefícios e inovações que um novo tratado poderia oferecer. Em seguida, a tese investiga as dinâmicas de poder e os relacionamentos que influenciam as negociações do tratado contra a poluição por plásticos, examinando os papéis e o impacto dos principais atores no processo de tomada de decisão. Reconhecendo que os acordos globais devem ser traduzidos em ações concretas nos níveis nacional e local e devem estabelecer sinergias e coordenação com outros instrumentos e agendas existentes, a pesquisa apoia a adoção de abordagens holísticas. Essas abordagens não devem se concentrar apenas no inteiro ciclo de vida dos plásticos, mas também considerar as complexidades mais amplas da questão, que se cruzam com a agenda oceânica, a agenda climática e outras preocupações ambientais críticas. Ao integrar os resultados dessas análises, esta tese fornece uma compreensão abrangente das complexidades da governança global do plástico e oferece estratégias para orquestrar um tratado que harmonize diferentes perspectivas sobre a poluição (marinha) por plásticos, eliminando os riscos de inconsistência ou conflitos ao identificar possibilidades de colaboração no caso de sobreposição de mandatos. Como metodologia, a pesquisa envolveu a implementação de um método qualitativo de natureza exploratória, consistindo em uma revisão da literatura científica e jurídica e uma análise crítica da legislação internacional. Os resultados contribuem para o avanço da pesquisa sobre governança ambiental internacional e fornecem recomendações práticas para a elaboração de um tratado global que atenda à urgência e à escala da crise da poluição por plásticos, ao mesmo tempo em que promove uma abordagem mais integrada para enfrentar os desafios ambientais interconectados.

Palavras-chave: Poluição Marinha por Plásticos. Governança Global. Emergência Oceânica.

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LIST OF ABBREVIATIONS AND ACRONYMS

µm	Micrometre
ABNJ	Areas Beyond National Jurisdiction
AHEG	Ad Hoc Open-Ended Expert Group on Marine Litter and Microplastics
ALDFG	Abandoned, lost or otherwise discarded fishing gear
AOSIS	Alliance of Small Island States
APEC	Asia-Pacific Economic Cooperation
APR	Asia-Pacific Region
BBNJ	Biodiversity Beyond National Jurisdiction
BPA	Bisphenol-A
BRICS	Brazil, Russia, India, China, and South Africa
BRS COP(s)	Basel, Rotterdam and Stockholm Conventions' Conference(s) of the Parties
CBD	Convention on Biological Diversity
CCD	Convention to Combat Desertification
CE	Circular Economy
CEAP	Circular Economy Action Plan
CFCs	Chlorofluorocarbons
CG(s)	Contact Group(s)
CiP	Chemicals in Products
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CMS	Convention on the Conservation of Migratory Species of Wild Animals
CO ₂	Carbon Dioxide
COP	Conference of the Parties
COSIS	Commission of Small Island States on Climate Change and International Law
CTE	Committee on Trade and Environment
DDT	Dichloro-diphenyl-trichloroethane
DecaBDE	Decabromodiphenyl ether
ECOSOC	United Nations Economic and Social Council
EDC(s)	Endocrine-Disrupting Chemical(s)
EEZ(s)	Exclusive Economic Zone(s)
EPPP(s)	Environmentally Persistent Pharmaceutical Pollutant(s)
EPR	Extended Producer Responsibility
ESM	Environmentally Sound Management
EU	European Union
FAO	Food and Agriculture Organization
G7	Group of Seven
G20	Group of Twenty
GATT	General Agreement on Tariffs and Trade
GBF	Kunming-Montreal Global Biodiversity Framework
GDP	Gross Domestic Product
GEF	Global Environment Fund
GESAMP	Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection
GFC	Global Framework on Chemicals – For a Planet Free of Harm from Chemicals and Waste
GHG(s)	Greenhouse Gas(es)
GLOC	Global Conference on Land-Ocean Connections
GNC	Global Network of the Committed
GPA	Global Programme of Action

GPGP	Great Pacific Garbage Patch
GPML	Global Partnership on Marine Litter/ Global Partnership on Plastic Pollution and Marine Litter
HAC	High Ambition Coalition to End Plastic Pollution
HBCDD	Hexabromocyclododecane
Hg	Mercury
HHP(s)	Highly Hazardous Pesticide(s)
HLPF	High-level Political Forum on Sustainable Development
HSLEEP	Hazardous Substances within the Life cycle of Electrical and Electronic Products
ICCM	International Conference on Chemicals Management
ICJ	International Court of Justice
ICP	Open-ended Informal Consultative Process on Oceans and the Law of the Sea
IDP	Informal Dialogue on Plastics Pollution and Environmentally Sustainable Plastics Trade
IFCS	Intergovernmental Forum on Chemical Safety
IGR(s)	Intergovernmental Review Meeting(s)
IGO(s)	Inter-governmental organisations
ILC	International Law Commission
ILO	International Labour Organization
IMDC	International Marine Debris Conference
IMF	International Monetary Fund
IMO	International Maritime Organization
INC	Intergovernmental Negotiating Committee
INCT	Informal Composite Negotiating Text
IOC	Intergovernmental Oceanographic Commission
IPBES	Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services
IPCC	Intergovernmental Panel on Climate Change
IPEN	International Pollutants Elimination Network
ISA	International Seabed Authority
ISO	International Organization for Standardization
ITLOS	International Tribunal for the Law of the Sea
IUCN	International Union for Conservation of Nature
kg	Kilogramme
LAC	Latin America and the Caribbean
LBI	Legally Binding Instrument
LC&P	London Convention and Protocol
LMICs	Low- and Middle-Income Countries
LT-LEDS	Long-Term Low-Emission Development Strategies
MARPOL	International Convention for the Prevention of Pollution from Ships
MDGs	Millennium Development Goal(s)
MEA(s)	Multilateral Environmental Agreement(s)
MEPC	IMO's Marine Environment Protection Committee
mm	Millimetre
MP(s)	Microplastic(s)
MPA(s)	Marine Protected Area(s)
MPP	Marine Plastic Pollution
MPW	Mismanaged plastic waste
NAP(s)	National Action Plan(s)
NBSAP(s)	National Biodiversity Strategy and Action Plan(s)

NDC(s)	Nationally Determined Contribution(s)
NGO(s)	Non-governmental organisation(s)
NIAS	Non-intentionally added substances
NOAA	National Oceanic and Atmospheric Administration
O20	Oceans 20
OECD	Organisation for Economic Co-operation and Development
PBB	Polybrominated biphenyls
PBDEs	Polybrominated diphenyl ethers
PCA	Permanent Court of Arbitration
PCB(s)	Polychlorinated Biphenyl(s)
PE	Polyethylene
PET	Polyethylene Terephthalate
PFAS(s)	Per- and Polyfluoroalkyl Substance(s)
PIC	Prior Informed Consent
POP(s)	Persistent Organic Pollutant(s)
PP	Polypropylene
PPWR	Packaging and Packaging Waste Regulation
PRTRs	Pollutant Release and Transfer Registers
PVC(s)	Polyvinyl chloride(s)
PWM	Plastic Waste Management
RoP	Rules of Procedure
SAICM	Strategic Approach to International Chemicals Management
SBC	Secretariat of the Basel Convention
SDG(s)	Sustainable Development Goal(s)
SIDS	Small Island Developing States
TBT	Agreement on Technical Barriers to Trade
UN	United Nations
UNCED	United Nations Conference on Environment and Development
UNCLOS	United Nations Convention on the Law of the Sea
UNCTAD	United Nations Conference on Trade and Development
UNDP	United Nations Development Programme
UNEA	United Nations Environment Assembly
UNECE	United Nations Economic Commission for Europe
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNGA	United Nations General Assembly
UNFCCC	United Nations Framework Convention on Climate Change
UNFSA	United Nations Fish Stocks Agreement
UNOC	United Nations Ocean Conference
UNWC	Convention on the Law of the Non-navigational Uses of International Watercourses
USA	United States of America
VCLT	Vienna Convention on the Law of Treaties
WCED	World Commission on Environment and Development
WCO	World Customs Organization
WEEE	Waste in Electrical and Electronic Equipment
WG40	Working Group 40
WTO	World Trade Organization

SUMMARY

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1 INTRODUCTION

Plastics, a material consisting essentially of highly modified synthetic or natural polymers, produced mainly from petroleum-derived chemicals, are present in natural ecosystems all over the planet¹. Once poorly managed, or mistakenly discarded, plastic materials become part of aquatic, aerial and terrestrial environments, where they remain for an indefinite period, accumulating without fulfilling the primary function for which they were developed².

Properties such as durability, malleability and corrosion resistance, combined with low production costs, have made plastics widely used by people, with applications in the most diverse sectors of society, from industrial activity to everyday use³.

The fact that plastics are quite resistant to corrosion, however, means that they easily accumulate in the environment when disposed of. This property gives them a difficult chemical degradation, even under extreme environmental conditions. In the ocean⁴, solar incidence, salinity, temperature and the strength of the waves favour the physical fragmentation of the plastic produced into smaller and smaller pieces – micro- and nanoplastics – capable of entering complex food chains and reaching the human body⁵.

¹ Hartmann, N.B.; *et. al.* (2019). Are We Speaking the Same Language? Recommendations for a Definition and Categorization Framework for Plastic Debris. **Environmental Science and Technology**, vol. 53, 1039-1047, p. 1045. Available at: <https://pubs.acs.org/doi/pdf/10.1021/acs.est.8b05297>. Accessed on 13 January 2022.

² Cheshire, A.; Adler, E. (2009). UNEP/IOC Guidelines on Survey and Monitoring of Marine Litter. Regional Seas Reports and Studies No 186. IOC Technical Series No 83. United Nations Environment Programme / Intergovernmental Oceanographic Commission. ISBN 978-92-807-3027-2. Available at: <https://wedocs.unep.org/xmlui/bitstream/handle/20.500.11822/13604/rsrs186.pdf?sequence=1&isAllowed=y>. Accessed on 13 December 2021.

³ Du, Y.; *et. al.* (2022). A review on marine plastisphere: biodiversity, formation, and role in degradation. **Computational and Structural Biotechnology Journal**, vol. 20, 975-988. Available at: <https://www.sciencedirect.com/science/article/pii/S2001037022000459>. Accessed on 09 January 2022.

⁴ The IOC of UNESCO is the UN body responsible for supporting global ocean science and services. This organisation has been working to protect the health of “our shared ocean” by coordinating programmes in ocean observations, hazard mitigation, tsunami warnings and marine spatial planning, among others. For this reason, considering this choice of the IOC to refer to our seas as a single global ocean, this research adopts the nomenclature “ocean” in the singular. For more, *see* IOC-UNESCO (2020a). **The Science we need for the ocean we want: the United Nations Decade of Ocean Science for Sustainable Development (2021-2030)**. Available at: <https://unesdoc.unesco.org/ark:/48223/pf0000265198>. Accessed on 13 March 2022.

⁵ Seay, J.; Ternes, M.E. (2022). A review of current challenges and legal advances in the global management of plastic waste. **Clean Technologies and Environmental Policy**, vol. 24, no. 3, p. 731-738. Available at: <https://link.springer.com/article/10.1007/s10098-022-02289-y>. Accessed on 29 January 2022.

Since the 1950s, the intense global production of plastics has changed the lifestyle of modern society, and their production, use and disposal has rapidly intensified, to the point that their use is now considered as a hallmark of the Anthropocene^{6,7}.

Plastic has been widely used in various sectors, including packaging, construction, automotive, and electronics. The production of plastic resins has surged by 620% since 1975. Between 1950 and 2017, it is estimated that 9.2 billion tons of plastic were produced, with approximately 7 billion tons (76%) becoming waste. Every year, an estimated 4.8 to 12.7 million tons of plastic enter the ocean⁸.

Despite ongoing initiatives and efforts, it is estimated that the amount of plastic in the ocean ranges from 75 to 199 million tons⁹. Without effective measures, this amount of could nearly triple, potentially reaching an average of 29 million tons annually, equivalent to 50 kg of plastic for every metre of coastal zone worldwide¹⁰.

The primary drivers of marine litter and plastic pollution are the increasing volumes of plastics entering the global economy, along with the waste and emissions generated from their usage and disposal¹¹.

The persistence of most plastics and the lack of efficient management of their end-of-life contribute to the problem¹². The cost of inaction is estimated at approximately USD 100 billion annually – a figure companies would face, if required by governments,

⁶ Villarrubia-Gómez, P.; *et al.* (2018). Marine plastic pollution as a planetary boundary threat - The drifting piece in the sustainability puzzle. **Marine Policy**, vol. 96, p. 213-220. Available at: <https://www.sciencedirect.com/science/article/pii/S0308597X17305456>. Accessed on 18 February 2022.

⁷ Since the 1979 World Climate Conference, humanity has acknowledged that the combustion of fossil fuels and deforestation, along with shipping and other activities, are fundamentally associated with increased atmospheric concentrations of carbon dioxide (CO₂). This reconnaissance has prompted the formulation of theories that link human activities to natural phenomena, specifically climate change. The term “Anthropocene” was introduced in the year 2000, designating a geological period that signifies the profound influence of human activities on the Earth. Its significance in the discussion is predicated on the understanding that only one planet exists, necessitating coordinated and collaborative efforts to devise solutions for these pressing contemporary challenges. In: Barros-Plataiu, A.F.; *et al.* (2015). *Correndo para o mar no antropoceno: a complexidade da governança dos oceanos e a estratégia brasileira de gestão dos recursos marinhos*. **Revista de Direito Internacional**, vol. 12, n. 1. Available at: <https://www.arqcom.uniceub.br/rdi/article/view/3292>. Accessed on 26 December 2023.

⁸ Jambeck, J.R.; *et al.* (2015). Plastic waste inputs from land into the ocean. **Science**, vol. 347, n. 6223, p. 768. DOI: 10.1126/science.1260352. Available at: <https://www.science.org/doi/10.1126/science.1260352>. Accessed on 17 June 2022.

⁹ UNEP (2021b). **From Pollution to Solution: A global assessment of marine litter and plastic pollution**. Synthesis. Nairobi, p. 14. ISBN: 978-92-807-3881-0. Available at: https://malaysia.un.org/sites/default/files/2022-02/POLSOLSum_1.pdf. Accessed on 12 April 2023.

¹⁰ Pew Charitable Trusts; Systemiq (2020). *Breaking the Plastic Wave: A Comprehensive Assessment of Pathways Towards Stopping Ocean Plastic Pollution*. Full report, p. 9. Available at: https://www.pewtrusts.org/-/media/assets/2020/07/breakingtheplasticwave_report.pdf. Accessed on 05 January 2022.

¹¹ UNEP (2021b). *Ob. cit.*, p. 46.

¹² UNEP (2016a). **UNEP Frontiers 2016 Report: Emerging Issues of Environmental Concern**. United Nations Environment Programme, Nairobi, p. 32. Available at: https://wesr.unep.org/media/docs/assessments/UNEP_Frontiers_2016_report_emerging_issues_of_environmental_concern.pdf. Accessed on 17 February 2022.

to cover the costs of proper waste management¹³.

In recent years, global plastic waste production is estimated to have reached 6.3 billion tonnes per year, a number that could double by 2030 if no action is taken to reduce the current disposal rate¹⁴. Because of its long residence time in the environment, all the plastic produced in the world to date is still on this planet¹⁵ – a legacy that will outlive us all¹⁶.

Legal definitions for plastics and how international law could – more emphatically – address it have been developed more recently, guided by science and interdisciplinarity to better characterise it. The fact that plastics are synthetic organic compounds implies the possibility of including them in the classification of Persistent Organic Pollutants (POPs), *i.e.*, substances essentially characterised by their constancy in the environment for long periods, as well as by bioaccumulation in the fatty tissues of living beings, in addition to their acute and chronic toxicity and the ability to travel long distances¹⁷.

The monomers that are components of some plastics – such as the polyethylene used to make shopping bags – are considered less hazardous. Nevertheless, these materials can still become toxic when they combine with other pollutants. Pesticides and organic pollutants, such as polychlorinated biphenyls, are consistently found in plastic waste, and many of them are “priority pollutants”, or chemicals regulated by government agencies because of their toxicity or persistence in organisms and food chains. These chemicals can disrupt key physiological processes in living beings – such as cell division and immunity, causing disease or reducing the ability of organisms to escape predators or reproduce¹⁸.

Despite this scenario, the knowledge generated about plastic as a global systemic problem is still somewhat superficial, especially regarding the fate of plastic waste mistakenly discarded in the environment and the geological and biological effects of the presence of this material in the natural environment¹⁹. It is already well-documented in

¹³ Pew Charitable Trusts; Systemiq (2020). *Ob. cit.*, p. 9.

¹⁴ Du, Y.; *et al.* (2022). *Ob. cit.*, p. 976.

¹⁵ Seay, J.; Ternes, M.E. (2022). *Ob. cit.*, p. 731.

¹⁶ Farrelly, T.; *et al.* (2021). Redressing the Faustian Bargains of Plastics Economies. In: **Plastic Legacies – Pollution, Persistence, and Politics**. AU Press, Athabasca University, p. 247. DOI: <https://doi.org/10.15215/aupress/9781771993272.01>. ISBN 9781771993289.

¹⁷ UNEP (2011b). **Stockholm Convention on Persistent Organic Pollutants (POPs)** – as amended in 2009 (Text and Annexes). Available at: https://www.env.go.jp/chemi/pops/treaty/treaty_en2009.pdf. Accessed on 01 August 2023.

¹⁸ Rochman, C.M.; *et al.* (2013). Classify plastic waste as hazardous. **Nature**, vol. 494, p. 170. DOI: <https://doi.org/10.1038/494169a>. Available at: <https://www.nature.com/articles/494169a>. Accessed on 12 February 2022.

¹⁹ Villarrubia-Gómez, P.; *et al.* (2018). *Ob. cit.*, p. 214.

the scientific literature, however, that poorly discarded or mismanaged plastic waste generated on the continent often has the ocean as its final destination, leading the marine ecosystem to face serious environmental problems²⁰.

It is estimated that plastic waste accounts for 80% of all marine pollution and that around 8 to 10 million tonnes of plastic end up in the ocean each year, with the majority of them originating from land-based sources²¹. The exact number is difficult to determine, as the sources of this pollution are numerous, both terrestrial and maritime, and the routes through which the material is transported to the ocean are equally varied²².

Furthermore, it is estimated that between 70% and 80% of the plastic that reaches the ocean has been transported by rivers and is also found in open sea areas far from the coasts. Marine plastic pollution (MPP), therefore, impacts the entire marine environment – from the surface to the ocean floor – affecting the ecology, the food chain and the organisms living there²³.

Marine pollution can lead to a range of impacts – acute, cumulative, and/or synergistic – and often has long-term consequences. These effects can be devastating, not only for the marine environment but also for marine biodiversity and the communities relying on marine resources for food and livelihoods. If the ocean is to be a key source of sustenance for the rapidly growing global population, then protecting its environmental health is essential²⁴ – especially because the ocean economy (or the blue economy) plays a crucial role in the future well-being and prosperity of humanity, providing essential resources like food, energy, minerals, health benefits, recreation, and transportation. It supports the livelihoods of hundreds of millions of people, making its sustainable management critical for global prosperity²⁵, particularly as ocean-based industries continue to expand at a rapid pace.

This expansion is driven by a range of factors, including the growing global population, economic development, increasing trade, rising incomes, as well as

²⁰ Seay, J.; Ternes, M.E. (2022). *Ob. cit.*, p. 734.

²¹ Fava, M. (2022). Ocean Plastic Pollution an Overview: Data and Statistics. UNESCO (United Nations Educational Scientific and Cultural Organization), IOC (Intergovernmental Oceanographic Commission) - Ocean Literacy Portal. Available at: <https://oceanliteracy.unesco.org/plastic-pollution-ocean/>. Accessed on 17 March 2023.

²² Villarrubia-Gómez, P.; *et. al.* (2018). *Ob. cit.*, p. 213.

²³ Du, Y.; *et. al.* (2022). *Ob. cit.*, p. 981.

²⁴ Cremean, D.; *et. al.* (2021). Marine Pollution Law. In: **Routledge Handbook of International Environmental Law**. Techera, E.; *et. al.* (eds.), 2nd edition, p. 173. ISBN 978-0-367-68503-4.

²⁵ OECD (2016). **The Ocean Economy in 2030**. OECD Publishing, Paris. DOI: <http://dx.doi.org/10.1787/9789264251724-en>. ISBN 978-92-64-25172-4 (PDF). Available at: <https://www.oecd.org/environment/the-ocean-economy-in-2030-9789264251724-en.htm>. Accessed on 22 December 2021.

technological advancements, climate change, and environmental considerations. Established ocean-based industries include shipping, shipbuilding, marine equipment, capture fisheries and fish processing, maritime and coastal tourism, conventional offshore oil and gas exploration and production, dredging, and port facilities. In addition, emerging ocean industries are increasingly shaped by the pivotal role of advanced science and technology – they include offshore wind, tidal and wave energy, deep-sea oil and gas extraction, seabed mining for metals and minerals, marine aquaculture, marine biotechnology, and ocean monitoring, control, and surveillance²⁶.

Looking toward the future, there are nascent or still-developing sectors, such as carbon capture and storage and the management of large-scale ocean protected areas, which could become integral parts of the ocean economy. Managing these economic activities, however, must take into account the unique physical context of the ocean – a dynamic, buoyant, and three-dimensional environment that spans approximately two-thirds of the Earth's surface²⁷.

Human health and sea-dependent sectors (such as tourism and artisanal fishing) also suffer socio-economic and environmental impacts from the presence of plastics in the marine ecosystem²⁸. Considering that the blue economy encompasses a wide range of industries that are vital to the global economy, there is one more reason for the ocean to be protected²⁹.

In this context, microplastics – plastic fragments larger than 0.1 µm and less than 5 mm in diameter – can be easily transported into the ocean and affect photosynthesis and phytoplankton growth, slow zooplankton swimming and reduce their reproductive capacity, as well as impacting animal stocks³⁰ and ocean carbon stocks³¹.

In fact, plastics can be found in various stages of degradation and are classified into different sizes: nanoplastics (<100nm), microplastics (<5 mm), mesoplastics (<2.5 cm), macroplastics (<1 m), and megoplastics (>1 m). Among these classifications, nano- and microplastics are of particular concern due to their widespread dispersion and difficulty of recovery in marine environments. Additionally, their small size makes them easily ingested by living organisms. Nanoplastics, in particular, are challenging to detect

²⁶ Rayner, R.; *et al.* (2019). Ocean Observing and the Blue Economy. **Frontiers in Marine Science**, vol. 6, p. 2-4. DOI: <https://doi.org/10.3389/fmars.2019.00330> Available at: <https://www.frontiersin.org/journals/marine-science/articles/10.3389/fmars.2019.00330/full>. Accessed on 26 December 2021.

²⁷ OECD (2016). *Ob. cit.*, p. 16.

²⁸ Villarrubia-Gómez, P.; *et al.* (2018). *Ob. cit.*, p. 213.

²⁹ OECD (2016). *Ob. cit.*, p. 16.

³⁰ Du, Y.; *et al.* (2022). *Ob. cit.*, p. 976.

³¹ Villarrubia-Gómez, P.; *et al.* (2018). *Ob. cit.*, p. 216.

in the ocean due to analytical difficulties³².

At present, plastics can be found in every marine environment across the globe – from the frozen waters of the Arctic to remote beaches, the deep abyss of the Mariana Trench, and within the bodies of hundreds of marine species. There are more pieces of plastic than there are stars in the Milky Way, and by 2050, they are expected to outweigh all the fish in the ocean³³.

In addition, its hydrophobic surface and long half-life facilitate the colonisation and transport of aquatic microorganisms over long distances and the adsorption of persistent organic pollutants³⁴. The microbial community attached to plastic fragments that differ from those found around them, and with the potential to cause undesirable biological or geophysical effects and impact vital processes in the Earth system, is called the “*plastisphere*”³⁵.

The presence of plastic throughout the marine environment, including the most remote regions, and the exponential growth in estimates of plastic use and disposal in the coming years, combined with the high capacity of this material to affect the ocean from sub-cellular processes down to ecosystem scale, make it essential and urgent to determine effective means to manage plastics in the sea. In this concern, there is a need to drive a global transition in the way we produce, use and dispose of plastic, as well as an update of legislation, governance and trade on a global scale of products made from this material, so that the negative impacts of (marine) plastic pollution³⁶ are mitigated – and perhaps, ideally, eliminated³⁷.

Given the relatively recent realisation by the scientific community regarding the ubiquity of MPP, public policies aimed at addressing this issue have gradually – but

³² Ali, N.; *et. al.* (2024). The potential impacts of micro-and-nano plastics on various organ systems in humans. **eBioMedicine**, vol. 99, p. 1. DOI: <https://doi.org/10.1016/j.ebiom.2023.104901>. Available at: <https://www.sciencedirect.com/science/article/pii/S235239642300467X>. Accessed on 13 May 2024.

³³ Kass, M.J. (2019). Fishing for Plastic: EU Targets Marine Pollution. **Natural Resources & Environment**, vol. 34, n. 1, p. 1. Available at: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3423433. Accessed on 17 January 2022.

³⁴ Zettler, E.R. ; *et. al.* (2013). Life in the “Plastisphere”: Microbial Communities on Plastic Marine Debris. **Environmental Science & Technology**, vol. 47, n. 13, 7137-7146. DOI: <https://doi.org/10.1021/es401288x>. Available at: <https://pubs.acs.org/doi/10.1021/es401288x>. Accessed on 17 January 2022.

³⁵ Villarrubia-Gómez, P.; *et. al.* (2018). *Ob. cit.*, p. 215.

³⁶ For clarification, by authorial decision, whenever the expression “(marine) plastic pollution” appears with “(marine)” in parentheses, it signifies that although the discussion pertains to plastic pollution in general – whether on land or in the ocean – this work primarily addresses and is focused on marine plastic pollution.

³⁷ Beaumont, N.J.; *et. al.* (2019). Global ecological, social and economic impacts of marine plastic. **Marine Pollution Bulletin**, vol. 142, p. 189-193. DOI: <https://doi.org/10.1016/j.marpolbul.2019.03.022>. Available at: <https://www.sciencedirect.com/science/article/pii/S0025326X19302061?via%3Dihub>. Accessed on 27 December 2021.

slowly – developed. This shift coincides with a significant global trend toward adopting environmental legal frameworks to mitigate plastic waste in the environment³⁸.

The international community has, for decades, adopted various legal mechanisms in response to different damages caused by marine pollution. The Exxon Valdez disaster in March 1989 remains one of the most catastrophic marine pollution incidents caused by ships. In an untouched ocean environment, the vessel ran aground, releasing over 40,000 tons (or 10 million gallons) of crude oil, which spread across the sea and shorelines³⁹. The resulting damage was widespread and has had long-lasting effects on the surrounding ecosystems and communities, the repercussions of which are still felt to the present day⁴⁰.

This event was not an isolated case, as other significant incidents include the 1967 Torrey Canyon spill⁴¹ and the 1978 Amoco Cadiz disaster⁴². In 1993, the Liberian-registered vessel *The Braer* released its cargo along the shores of the Shetland Islands⁴³.

Later, in 1996, the *Sea Empress* ran aground at St. Ann's Head, Milford Haven, followed by the 2002 *Prestige* spill off the Spanish coast⁴⁴. While oil spills from ships have significantly decreased, they still occur⁴⁵.

A recent example is the 2018 sinking of the Iranian tanker *Sanchi* in the East China Sea after colliding with a Chinese cargo ship. The tanker was carrying more than 136,000 metric tons of ultralight crude oil⁴⁶.

Similarly, in 2019, a massive oil spill affected Brazil's tropical coastline, with

³⁸ Seay, J.; Ternes, M.E. (2022). *Ob. cit.*, p. 735.

³⁹ Guterman, L. (2009). Exxon Valdez Turns 20. **Science**, vol. 323, n. 5921, p. 1558-1559. DOI: 10.1126/science.323.5921.1558. Available at: <https://www.science.org/doi/abs/10.1126/science.323.5921.1558>. Accessed on 03 March 2022.

⁴⁰ Harwell, M.A.; et. al. (2013). Characterizing ecological risks, significance, and recovery. In: **Oil in the Environment: Legacies and Lessons of the Exxon Valdez Oil Spill**. Wiens, J. (ed.). Cambridge: Cambridge University Press, p. 383. ISBN 978-1-107-61469-7.

⁴¹ Law, R.J. (2011). Chapter 33 - The Torrey Canyon Oil Spill, 1967. *Oil Spill Science and Technology*, p. 1103-1106. DOI: <https://doi.org/10.1016/B978-1-85617-943-0.10033-4>. Available at: <https://www.sciencedirect.com/science/article/abs/pii/B9781856179430100334>. Accessed on 19 December 2021.

⁴² Jones, P.H.; et. al. (1978). Birds oiled during the Amoco Cadiz incident – An interim report. **Marine Pollution Bulletin**, vol. 9, n. 11, p. 307-310. DOI: [https://doi.org/10.1016/0025-326X\(78\)90256-4](https://doi.org/10.1016/0025-326X(78)90256-4). Available at: <https://www.sciencedirect.com/science/article/pii/0025326X78902564>. Accessed on 19 December 2021.

⁴³ Broekema, W. (2015). Crisis-Induced Learning and Issue Politicization in the EU: The Braer, Sea Empress, Erika, And Prestige Oil Spill Disasters. **Public Administration**, vol. 94, n. 2, p. 389. DOI: <https://doi.org/10.1111/padm.12170>. Available at: https://onlinelibrary.wiley.com/doi/epdf/10.1111/padm.12170?saml_referrer. Accessed on 17 December 2021.

⁴⁴ *Ibid.*, p. 390-395.

⁴⁵ Cremean, D.; et. al. (2021). *Ob. cit.*, p. 174.

⁴⁶ Sun, S.; et. al. (2018). Tracking an Oil Tanker Collision and Spilled Oils in the East China Sea Using Multisensor Day and Night Satellite Imagery. **Geophysical Research Letters**, vol. 45, n. 7, p. 2883. DOI: <https://doi.org/10.1002/2018GL077433>. Available at: <https://agupubs.onlinelibrary.wiley.com/doi/full/10.1002/2018GL077433>. Accessed on 22 January 2022.

dense crude oil washing ashore along more than 3.000 kilometres and contaminating nearly a thousand beaches. Within a few months, the spill reached as far as the Amazon coast, making it one of the most severe disasters ever recorded in tropical coastal regions worldwide⁴⁷.

As a result of these disasters, the international community has implemented numerous instruments aimed at addressing general marine pollution⁴⁸. However, when it comes to the specific issue of marine plastic pollution, there is still no international instrument dedicated solely to its regulation.

MPP has been tangentially included in international environmental agenda focused, more generally, on measures to mitigate impacts from a wide variety of human actions on the marine environment⁴⁹ – governance measures based on international law, particularly the 1982 United Nations Convention on the Law of the Sea (UNCLOS), have proven ineffective in halting or reversing these trends⁵⁰.

Other treaties already in force, such as the International Convention for the Prevention of Pollution from Ships (MARPOL), the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal, the Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade the Stockholm Convention on Persistent Organic Pollutants, and the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, are also not sufficient to provide solutions that address the full scale of the problem – mainly because there is a lack of coordination among all of them⁵¹.

This statement is based, among other reasons, on the fact that, when discussing (marine) plastic pollution, the focus is usually on ended plastic products and, in particular, waste – it is usually the disposable items that receive all the attention: cups, straws, cutlery, bags, etc. The problem is, nevertheless, much broader, as the life cycle of plastic includes

⁴⁷ Soares, M. de O.; *et. al.* (2020). Oil spill in South Atlantic (Brazil): Environmental and governmental disaster. **Marine Policy**, vol. 115, 103879, p. 1-7. DOI: <https://doi.org/10.1016/j.marpol.2020.103879>. Available at: <https://www.sciencedirect.com/science/article/pii/S0308597X19308346>. Accessed on 11 August 2025.

⁴⁸ Cremean, D.; *et. al.* (2021). *Ob. cit.*, p. 174.

⁴⁹ Simon, N.; *et. al.* (2021). A binding global agreement to address the life cycle of plastics – To eliminate plastic pollution, a holistic approach is needed. **Science**, vol. 373, n. 6550, p. 43-47. DOI: 10.1126/science.abi9010. Available at: <https://www.science.org/doi/full/10.1126/science.abi9010>. Accessed on 11 January 2022.

⁵⁰ Telesetsky, A; Bratspies, R. (2021). Marine Environmental Law: UNCLOS, ocean governance and fisheries. In: **Routledge Handbook of International Environmental Law**. Techera, E.; *et. al.* (eds.), 2nd edition. ISBN 978-0-367-68503-4.

⁵¹ Simon, N.; *et. al.* (2018). No more Plastics in the Ocean - Gaps in Global Plastic Governance and Options for a Legally Binding Agreement to Eliminate Marine Plastic Pollution. Draft report for WWF to support discussions at the Ad Hoc Open-ended Expert Group on Marine Litter and Microplastics. Berlin: adelphi. Available at: <https://www.ecologic.eu/16131>. Accessed on 07 February 2022.

raw material extraction; design and production; packaging and distribution; use and maintenance; recycling, reuse, recovery or final disposal – a point at which it becomes plastic waste. Across their lifecycle, plastics can leak into the environment at any stage of it, leading to various health and environmental implications – some already known, but many still uncertain due to data gaps⁵².

Focusing only on the last stages of the life cycle – which is what most existing instruments do – is potentially neglecting the rest of the plastic pollution problem⁵³.

In this regard, the creation and adoption of an international legally binding instrument (LBI) dedicated to addressing (marine) plastic pollution is essential. The new treaty must be able to ensure compliance with specific standards, incorporating sanctions for non-compliance with the agreed terms. Its intended outcomes should focus on mitigating the harmful effects of this synthetic material on natural ecosystems, particularly the marine environment⁵⁴. After all, plastic pollution is an escalating global challenge, possibly second only to climate change in terms of its scope and impact⁵⁵.

Recognising the urgency of this threat, the international community has begun to mobilise collective action. Therefore, in 2022, the United Nations Environment Assembly (UNEA), during the second half of its fifth session (UNEA-5.2), proposed the drafting of the “Global Plastics Treaty”⁵⁶, through Resolution 5/14, entitled “Ending Plastic Pollution: Towards an International Legally Binding Instrument”⁵⁷.

With that, the regulation of MPP has formally shifted towards integrating global

⁵² Among these gaps, there is a clear need for further research on the influence of norms within the fragmented, multilevel global governance of plastics. Additionally, it would be essential to foster greater epistemological diversity, particularly through more critical and reflective approaches to understanding the causes and consequences of marine plastic pollution. In: Groot, B.d.; *et. al.* (2025). Identifying knowledge gaps in the politics of marine plastic pollution. In: **A Research Agenda for Sustainable Ocean Governance**. Justin Alger and U. Rashid Sumaila (eds.). Cheltenham, UK: Edward Elgar Publishing, p. 245-246. ISBN: 978 1 03532 574 0.

⁵³ Nagtzaam, G.; *et. al.* (2023). Current International Law and Plastic. In: **Global plastic pollution and its regulation** – History, Trends, Perspectives. Massachusetts: Edward Elgar Publishing, 376 p. ISBN: 978 1 80037 354 9. DOI: <http://dx.doi.org/10.4337/9781800373556>. Available at: <https://www.elgaronline.com/monobook/book/9781800373556/9781800373556.xml>. Accessed on 17 November 2024.

⁵⁴ Guggisberg, S. (2024). Finding equitable solutions to the land-based sources of marine plastic pollution: Sovereignty as a double-edged sword. **Marine Policy**, vol. 159, p. 2. DOI: <https://doi.org/10.1016/j.marpol.2023.105960>. Available at: <https://www.sciencedirect.com/science/article/pii/S0308597X23004931>. Accessed on 12 November 2024.

⁵⁵ Seay, J.; Ternes, M.E. (2022). *Ob. cit.*, p. 731.

⁵⁶ Although the future treaty is commonly referred to as the “Global Plastics Treaty”, the UNEA mandate actually designates it as an “international legally binding instrument on plastic pollution, including in the marine environment”. As a result, several terms are used interchangeably throughout this research to refer to the forthcoming treaty.

⁵⁷ UNEA (2022a). **5/14. End plastic pollution: towards an international legally binding instrument**. Resolution adopted by the United Nations Environment Assembly on 2 March 2022 (UNEP/EA.5/Res.14). Available at: https://digitallibrary.un.org/record/3999257/files/UNEP_EA.5_RES.14-EN.pdf?ln=en. Accessed on 17 July 2022.

governance frameworks. This development is expected to bring about a concurrent shift in the governance of MPP, transitioning from a “decentralised” to a “centralised” approach and from “soft law” to “hard law” mechanisms⁵⁸.

Recognising that increasing levels of environmental pollution caused by plastics are a transboundary problem on a global scale and considering all pre-existing international instruments and conventions that address plastic pollution – in some extent –, the UNEA mandate defined that an Intergovernmental Negotiating Committee (INC) should be the body responsible for conducting negotiations between countries, ultimately developing a new treaty by the end of 2024⁵⁹ – although this period has been extended⁶⁰.

The objective of the INC meetings is to craft a legally binding document aimed at reducing the volume of plastics entering the natural environment – especially the ocean. This objective will be pursued through a comprehensive approach that includes restructuring the plastics lifecycle, supported by Circular Economy (CE) strategies, systemic change, and investment to enable the economically viable production of plastic substitutes. Additionally, the creation of a global regulatory framework and concerted efforts to ensure full implementation of the provisions outlined in the treaty’s final text will be essential⁶¹.

A total of five negotiation sessions have already taken place, but INC-5 ended without an agreement – thus failing the UNEA mandate⁶². The second part of the fifth session – intended to conclude the negotiation process – was recently held in Geneva, Switzerland, from 5 to 14 August 2025. However, it also ended without a finalised agreement and was adjourned due to the lack of consensus⁶³. A new date and venue for a third part of the fifth session have yet to be announced.

⁵⁸ Zhou, J.; Luo, D. (2024). The global governance of marine plastic pollution: rethinking the extended producer responsibility system. *Frontiers in Marine Science*, vol. 11, p. 02. DOI: <https://doi.org/10.3389/fmars.2024.1363269>. Available at: <https://www.frontiersin.org/journals/marine-science/articles/10.3389/fmars.2024.1363269/full>. Accessed on 05 April 2024.

⁵⁹ UNEA (2022a). *Ob. cit.*, p. 2.

⁶⁰ The INC decided to postpone the fifth session of the negotiations. The second part of the fifth session (INC-5.2) was held from 5 to 14 August 2025 at the Palais des Nations in Geneva, Switzerland. The resumed session was preceded by regional consultations on 4 August 2025. In: UNEP (2024c). Fifth Session (INC-5). Available at: <https://www.unep.org/inc-plastic-pollution/session-5>. Accessed on 20 February 2025.

⁶¹ UNEA (2022a). *Ob. cit.*, n.p.

⁶² Vibhu, M. (2024). Plastic pollution treaty negotiations adjourn in Busan, to resume next year. United Nations, UN News, Climate and Environment. Available at: <https://news.un.org/en/story/2024/12/1157646>. Accessed on 02 April 2025.

⁶³ UNEP (2025a). Second Part of the Fifth Session (INC-5.2). Press Release “Talks on global plastic pollution treaty adjourn without consensus”. Available at: <https://www.unep.org/inc-plastic-pollution/media#PressRelease15Aug>. Accessed on 22 August 2025.

Despite this delay, (marine) plastic pollution and microplastics were subjects emphatically addressed in the discussions for the preparation of the new document, with particular attention dedicated due to their broad and specific impacts on the ocean environment. Significant emphasis was also placed on the need for international cooperation to strengthen the interface between science and public policy, as well as the strengthening of global coordination and governance to take immediate action towards the long-term reduction and eventual elimination of plastic pollution in marine and other ecosystems⁶⁴.

Therefore, the UNEA mandate – or Resolution 5/14 – represents, above all, the will of States to overcome the lack of consensus that permeates deliberations on this issue and to promote the overcoming of environmental, social and economic problems caused by the excessive production, consumption and disposal of plastics – this “will”, however, does not imply that significant divergences on many aspects of the text do not exist, which have inevitably contributed to delays in the negotiation process⁶⁵.

Considering all these factors, this research is concerned with the development of a global governance for marine plastic pollution. Governance can be defined as the process through which society sets goals, establishes priorities, and fosters cooperation at global, regional, national, or local levels. Governance structures are manifested through legal and policy frameworks, strategies, and action plans, which outline the organisational arrangements for implementing policies and tracking progress⁶⁶.

It encompasses the rules of decision-making, including who has access to information, who participates in the decision-making process, and the decisions themselves. Governance is often characterised by power dynamics, relationships, and accountability: who holds influence, who makes decisions, and how those decision-makers are held accountable. Ultimately, governance serves as a means to achieve specific objectives, rather than being an objective in itself⁶⁷.

In this context, the research investigates if the developing global governance for marine plastic pollution would be able to address the legal gaps identified and face the ocean emergency – a term used, in an analogy to the “climate emergency” to express that

⁶⁴ UNEA (2022a). *Ob. cit.*, n.p.

⁶⁵ Vibhu, M. (2024). *Ob. cit.*, n.p.

⁶⁶ Roe, M. (2013). Governance. In: **Maritime Governance and Policy-Making**. London: Springer, p. 41-42. ISBN 978-1-4471-4152-5.

⁶⁷ Scanlon, J.; Burhenne-Guilmin, F. (2004). International Environmental Governance: An International Regime for Protected Areas. IUCN Environmental Policy and Law Paper No. 49, p. 2. IUCN Environmental Law Programme. ISBN 2-8317-0768-4. Available at: <https://portals.iucn.org/library/efiles/documents/EPLP-049.pdf>. Accessed on 13 May 2022.

the ocean is at a tipping point⁶⁸.

The two primary objectives of this analysis, thus, are: i) to identify the international legal gaps that the new treaty must address by analysing relevant instruments on the subject; and ii) to gather legal perspectives on the final text of the future LBI, exploring the key challenges it will face – primarily in the legal domain, but also socially, in terms of its effectiveness. Additionally, the potential synergies this treaty could establish with other international legal instruments, particularly the framework focused on combating climate change, are a crucial aspect of the investigation.

After all, international environmental law is already fragmented, and the emergence of a new treaty presents both opportunities for coordination with other mechanisms, and the potential for conflict.

- *Objectives*

Considering that most plastic waste found in the ocean originates from land-based activities, national legal systems should regulate the prevention and control of behaviours contributing to the problem. However, since plastic waste, once released into the ocean, can travel through sea currents and impact other countries, the issue also warrants attention under international law. For this reason, and in alignment with the program to which this research is linked, the primary focus is placed on international legal frameworks.

Consequently, this doctoral thesis focuses primarily on the general considerations that international actors should consider when attempting to manage marine plastic pollution (MPP) on a global scale. Rather than providing a detailed outline or blueprint for a new plastic management regime – although several components of the upcoming treaty, based on the documents published so far, are analysed –, the aim is to draw from the knowledge and experience gained in addressing other global environmental issues to offer useful insights for managing MPP on an international level.

When examining the current state of global environmental governance, it becomes clear that the international community has yet to effectively manage major environmental challenges, including pollution. Many international environmental agreements have struggled with broad participation, compliance, and the necessary provisions to fully

⁶⁸ Threatened by many anthropogenic pressures and stressors – such as plastic pollution, over-fishing and climate change –, the state of the ocean is in decline. In this context, in his speech to the UN Ocean Conference, the Secretary General of the UN, António Guterres, declared an Ocean Emergency in 2022. In: UN (2022a). UN Secretary-General declares an “Ocean Emergency”. Available at: <https://unric.org/en/un-secretary-general-declares-an-ocean-emergency/>. Accessed on 29 June 2022.

achieve their objectives.

Therefore, it is valuable to explore this scenario, which is divided into two parts. The dividing point is the launch of the UNEA Resolution 5/14 in March 2022. Therefore, a “dual” investigation is carried out, evaluating the scenario before and after the adoption of this document. Reflecting this dual focus and in order to achieve the objectives proposed to this research, a two-part plan (or summary) was developed.

The main research questions guiding the work are:

- i) *What are the gaps that the new treaty must overcome?*
- ii) *Once finalised and adopted, how will it operate in the broader context of international environmental law?*

To answer the first general question, Part I of the thesis focuses on how global environmental agreements, particularly those addressing (marine) plastic pollution within a global reach, can be better structured and designed. The instruments selected for this analysis are those specifically referenced in Paragraphs 11 and 13 of the Preamble of the Resolution 5/14 – excluding those focused on addressing regional issues. Additionally, other relevant instruments not mentioned in the mandate were included, as they provide valuable insights into the topic.

Part I “2 THE INTERNATIONAL LAW FRAMEWORK IN ANTICIPATION OF THE NEW GLOBAL PLASTICS TREATY” is divided into two Chapters, each consisting of two Sections, which are further subdivided into two Subsections. Chapter I “2.1 Identifying the Applicable Law and Gaps in Hard and Soft Law Instruments” is concerned with identifying the main gaps existing in international law, both in binding mechanisms (Section I “2.1.1”) and in voluntary commitments (Section II “2.1.2”). Subsequently, Chapter II “2.2 Going beyond the gaps: how plastics have been approached so far” goes beyond those gaps and concentrates on more practical approaches to addressing MPP, first exploring the concepts of CE and its relations with the global trade of plastic waste (Section I “2.2.1”) and then moving to emerging legal perspectives regarding the consequences of (marine) plastic pollution, which relate State’s responsibility and the plastics industry accountability (Section II “2.2.2”).

After presenting deepening the context prior to March 2022, the thesis concentrates on the scenario surrounding the enactment of the Resolution 5/14 and the commencement of negotiations. It explores the pathways leading to the Resolution’s adoption, delves into the specifics of its content, and highlights key aspects that should

guide the development of the future treaty. Part II concludes with an examination of potential synergies that the upcoming treaty could establish with other components of the international environmental agenda.

Part II “3 TOWARDS THE DEVELOPMENT OF AN INTERNATIONAL REGIME TO COMBAT (MARINE) PLASTIC POLLUTION” is also divided into two Chapters, each consisting of two Sections, which are further subdivided into two Subsections. Chapter I “3.1 The Content of Resolution 5/14 and the Negotiations for a New Treaty: Legal Reflections on the Approach and Structure of the Future Instrument” provides a comprehensive contextualisation of the UNEA mandate, delving into key aspects relevant to the formulation of the future treaty (Section I “3.1.1”) and examining the main repercussions of the negotiation sessions thus far (Section II “3.1.2”). In Chapter II “3.2 The Legally Binding Instrument on Plastic Pollution: Possible Dialogues with different Environmental Agendas”, the focus shifts to the finalisation of the treaty and explores potential synergies between plastics governance and other environmental agendas, particularly the framework aimed at combating climate change (Section I “3.2.1”). Lastly, the thesis introduces an innovative element by analysing all Nationally Determined Contributions (NDCs) published up until 19 March 2024⁶⁹ (Section II “3.2.2”). Based on this review, the thesis proposes that upcoming NDC submissions should incorporate strengthened governmental accountability for addressing the climate impacts of plastics.

In conclusion, the final considerations are presented, followed by a comprehensive list of references used throughout the research. Lastly, Annex A presents a table summarising the data collected from the analysis of global NDCs.

- *Methodology*

In order to achieve the objectives of this doctoral thesis the methodology used is based on sources of international environmental law, with the integration of literature and data from other sciences, with the purpose of complementing the understanding of aspects that are not purely legal.

Indeed, in order to analyse the extensive body of work on the development of international environmental agreements, this thesis does not limit itself to considering

⁶⁹ Due to time constraints in the completion of this work, and in accordance with the research schedule, only the NDCs available in the UNFCCC NDC Registry as of 19 March 2024 were considered. Future versions of this study will incorporate the most recent NDCs, particularly those communicated by Parties in 2025.

exclusively the legal literature. It draws extensively on the contributions of scholars in political science, international relations, economics, and environmental sciences, since the creation of an international agreement cannot be reduced to a mere legal matter. Understanding the dynamics of global politics and recognising how economic, social, and environmental considerations often shape the willingness and commitment of state leaders is, in fact, essential for analysing international cooperation.

A methodological challenge faced in researching and writing this thesis was largely associated with the fact that the main topic is still under development. The future LBI is being negotiated at the very time this thesis is being delivered – after two years of negotiations, however, there is already a considerable amount of research on the subject, which has allowed for an even more in-depth and well-founded analysis.

The thesis uses general scientific methods such as theoretical, bibliographic, descriptive, exploratory and qualitative research. Some results of this work are also derived from empirical research, resulting from active participant observation during the second session of the INC (from 29 May to 2 June 2023). Other moments of participant observation that contributed with valuable insights to the results of this research were: the attendance to the Second UN Ocean Conference (from 27 June to 1 July 2022); the Ocean Literacy World Conference (7-8 June 2024); and the 2024 UN Climate Change Conference (UNFCCC COP 29) (11-22 November 2024). Overall, this doctoral thesis includes over 180 hours of direct participant observation during relevant international conferences.

For the theoretical part of the research, the foundation of the study is built upon a comprehensive review of primary and secondary sources from reputable international organisations and legal frameworks – which was conducted between December 2021 and August 2025.

Key materials include documents, reports, treaties, and resolutions from various international bodies such as the United Nations, the World Trade Organization, the International Maritime Organization, and others involved in environmental and marine governance. Additionally, relevant international normative legal acts, including conventions, protocols, and declarations that pertain to marine plastic pollution and environmental law, are examined to provide a contextual basis for the study.

To ensure a rigorous and wide-ranging examination of the subject matter, the research also draws upon academic literature sourced from databases such as Google Scholar, Web of Science, Scopus, and JSTOR. This includes peer-reviewed journal articles, books, and academic papers that offer critical insights into both the theory and

practice of international environmental governance, with a specific focus on (marine) plastic pollution. These scholarly resources provide a foundation for understanding the evolution of global legal instruments, the implementation challenges, and the effectiveness of existing policies related to marine plastic pollution.

Additionally, a *quali-quantitative* analysis was conducted to evaluate the NDCs submitted until 19 March 2024, covering a total of 195 submissions. This analysis involved both quantitative metrics – such as the frequency and distribution of specific plastic-related commitments – and qualitative assessments of the content and context of the NDCs. The results were filtered, synthesised, and summarised in a table, which is presented in Annex 1 of this thesis.

Furthermore, a qualitative analysis of the documents is employed, allowing for the identification of key themes, trends, and legal gaps in the global governance of marine plastic pollution. The research focuses on synthesising the existing legal frameworks, identifying areas of synergy and conflict, and exploring the possibilities surrounding the development of the future LBI on (marine) plastic pollution. Through this approach, the study aims to provide a comprehensive understanding of the current state of international law as it pertains to marine plastic pollution and its governance, while also contributing insights into possible legal and policy developments in this area.

2 THE INTERNATIONAL LAW FRAMEWORK IN ANTICIPATION OF THE NEW GLOBAL PLASTICS TREATY

Part I of this research outlines the situation leading up to the commencement of negotiations for the future Legally Binding Instrument (LBI) aimed at addressing and fighting (marine) plastic pollution. The development of this LBI has been eagerly anticipated, especially in light of the current condition of the ocean, which is burdened and stressed by the growing presence of plastic pollutants.

In fact, for a long time, humanity has viewed the ocean as vast sink for waste, believing that the natural processes of water would handle the chemical and biological recycling of discarded materials⁷⁰. It wasn't until a plastic waste island formed in the Pacific Ocean, covering an estimated 1.6 million square kilometres – three times the size of France⁷¹ – that the global community fully grasped the magnitude of the problem.

In the past decade, plastic pollution along coastlines and in the open ocean has become one of the most significant environmental challenges worldwide. Plastics do not just accumulate in garbage patches; their durability and tendency to break down into microplastics further complicate waste management efforts⁷².

Moreover, exposure to UV radiation accelerates the fragmentation and degradation of plastics, while in environments without such exposure, like water, this process occurs very slowly. Even plastics labelled as biodegradable do not break down quickly when left in the natural conditions of the ocean⁷³.

It is, however, unsurprising that plastic has reached even the most remote and pristine locations, becoming a widespread and persistent presence in marine

⁷⁰ Kiss, A.; Beurier, J.P. (2000). *Droit international de l'environnement. Quatrième édition*, ISBN: 978-2-233-00598-4, p. 152.

⁷¹ Lebreton, L.; *et al.* (2018). Evidence that the Great Pacific Garbage Patch is rapidly accumulating plastic. **Scientific Reports**, vol. 8, p. 13. DOI: <https://doi.org/10.1038/s41598-018-22939-w>. Available at: <https://www.nature.com/articles/s41598-018-22939-w>. Accessed on 09 June 2022.

⁷² Dauvergne, P. (2018). Why is the global governance of plastic failing the oceans? **Global Environmental Change**, vol. 51, p. 22-31, ISSN 0959-3780, DOI: <https://doi.org/10.1016/j.gloenvcha.2018.05.002>. Available at: <https://www.sciencedirect.com/science/article/abs/pii/S0959378017314140>. Accessed on 30 October 2022.

⁷³ UNEP (2015). **Biodegradable Plastics and Marine Litter**. Misconceptions, concerns and impacts on marine environments. United Nations Environment Programme (UNEP), Nairobi. Available at: https://wedocs.unep.org/bitstream/handle/20.500.11822/7468/-Biodegradable_Plastics_and_Marine_Litter_Misconceptions_concerns_and_impacts_on_marine_environments-2015BiodegradablePlasticsAndMarineLitter.pdf.pdf?sequence=3&isAllowed=1. Accessed on 30 October 2022.

environments, wildlife, inland waters, soils, and the air, even becoming a significant planetary boundary threat⁷⁴.

Recent studies indicate that the production and incineration phases of the plastic life cycle release large amounts of chloride, which plays a key role in the growth and concentration of atmospheric aerosols. The marine environment, largely through river input of improperly managed plastic waste and overlooked sources such as ship coatings, serves as the ultimate sink for this relatively new form of pollution, which has now become a common element in seawater. Plastic is so pervasive that it could be said to have its own biogeochemical cycle⁷⁵.

The widespread presence of plastic pollution has led the United Nations Environment Programme (UNEP) to recognise it as a defining feature of the Anthropocene, the current geological era. The accumulation of plastic creates a new marine microbiotic habitat, known as the “plastisphere”⁷⁶. Plastic waste, hence, makes up 60% to 80% of all marine debris – with the majority originating from land-based sources⁷⁷.

In response to the harmful impacts of plastic accumulation in the environment and the known sources of plastic waste in the ocean, various stakeholders at international, national, and local levels have implemented measures from different approaches over time.

These range from basic actions, such as banning the intentional discharging of plastics into the ocean and improving urban waste management, to more advanced strategies, like reducing the production of virgin plastics, promoting sustainable products through eco-design, banning certain plastic and microplastic uses, and increasing plastic

⁷⁴ Villarrubia-Gómez, P.; *et al.* (2018). *Ob. cit.*, p. 213.

⁷⁵ Galgani, L.; *et al.* (2022). Hitchhiking into the Deep: How Microplastic Particles are Exported through the Biological Carbon Pump in the North Atlantic Ocean. **Environmental Science & Technology**, vol. 56, p. 15638–15649. DOI: <https://doi.org/10.1021/acs.est.2c04712>. Available at: <https://www.plasticheal.dk/media/temb4aw0/galgani-et-al-2022-hitchhiking-into-the-deep-how-microplastic-particles-are-exported-through-the-biological-carbon-pump.pdf>. Accessed on 12 April 2023.

⁷⁶ UNEP (2021b). *Ob. cit.*, p. 3.

⁷⁷ While it is often stated that 80% of ocean litter originates from land and the remaining 20% from the sea, this frequently cited statistic cannot be traced back to a published scientific paper or technical report, and its origins are still under investigation by GESAMP. Few attempts have been made to estimate the global influx of plastic litter from land-based sources, and no global estimates have been conducted regarding sea-based sources of marine litter. In the absence of comprehensive data, the “80/20” figures continue to be cited in numerous papers and reports. However, despite the lack of global estimates for sea-based marine litter, the quantity, geographical spread, quality, and consistency of research on marine litter and microplastics have grown significantly in recent years. In: GESAMP (2021). Sea-based sources of marine litter. (Gilardi, K., ed.) (IMO/FAO/UNESCO-IOC/UNIDO/ WMO/IAEA/UN/UNEP/UNDP/ISA Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection). Rep. Stud. GESAMP No. 108, p. 9. Available at: <http://www.gesamp.org/site/assets/files/2213/rs108e.pdf>. Accessed on 15 April 2023.

recycling rates to foster a CE⁷⁸. These measures not only address the issue of plastic pollution but also contribute to combating climate change, as it is going to be further discussed in Part II of this thesis.

The role of law is crucial in regulating the essential and urgent behavioural changes needed to tackle these challenges. Nevertheless, considering that a LBI to resolve the phenomenon is currently being negotiated, it is no surprise to affirm that the international instruments traditionally used to combat marine plastic pollution are proving insufficient, both in their implementation and in their content.

Although the international community is gradually integrating this need through the various existing international regimes and instruments, while considering the possibility and opportunity of adopting a new treaty on the matter, the fight against plastic pollution of the ocean remains a real challenge for international law.

Consequently, this part of the research provides an overview of the scenario prior to the beginning of negotiations on the future LBI to fight plastic pollution. As of the time this thesis is written, there is not a single instrument in force that focuses specifically on preventing plastic pollution across its entire lifecycle, whether on land or in the marine environment.

While there are a few agreements addressing pollution from various sources, none are dedicated solely to tackling plastic pollution. By attempting to accomplish their own goals, several international agreements may indirectly help reduce the amount of plastic waste in the environment.

Hence, this part of the thesis addresses important key questions, such as:

- i) What are the key international legal agreements that address marine plastic pollution, and what are their main limitations and gaps in combating the issue effectively?
- ii) What are the most significant gaps in international law regarding the prevention and management of marine plastic pollution, and how do these gaps hinder progress?
- iii) How do voluntary commitments contribute to the global fight against marine plastic pollution, and what role do they play in complementing binding legal mechanisms?

⁷⁸ Systemiq; Handelens Miljøfond; Mepex (2023). **Achieving Circularity** – Synthesis Report – a low-emissions circular plastic economy in Norway. Available at: https://www.systemiq.earth/reports/downloads/Systemiq_Achieving_Circularity_Synthesis_Report.pdf. Accessed on 17 February 2024.

- iv) How have legal perspectives evolved in response to the gaps in international law, particularly through the lens of plastic litigation and cases where accountability is pursued within the plastics industry?

To achieve the outlined objectives, Part I (“2”) is structured into two Chapters. Chapter I (“2.1”) focuses on identifying key legal gaps, exploring the fragmentation of international law and offering a comprehensive overview of the current situation regarding marine plastic pollution. This Chapter is divided into two Sections, which transition from examining binding instruments to analysing voluntary commitments.

Chapter II (“2.2”) expands beyond these gaps by critiquing Circular Economy (CE) strategies, highlighting how they often focus on a single aspect of the plastic lifecycle, such as recycling. The Chapter then connects this critique to the global plastics trade, emphasising the resulting injustices, including discrepancies between developed and developing countries. Finally, the Chapter examines state responsibility, liability, and plastic litigation cases, where affected parties often seek accountability from the plastics industry.

2.1 Identifying the Applicable Law and Gaps in Hard and Soft Law Instruments

This chapter provides an overview of the main international instruments dedicated to managing environmental challenges, encompassing – at least, to some extent – issues such as marine plastic pollution.

Since plastics have become a widely used material across various industries due to their (presumed) safety, durability, affordability, and versatility in forming different shapes, the increase in their use – primarily the consumption of single-use plastics – has led to a significant environmental concern: the increasing amount of plastic waste entering the ocean.

Each year, tonnes of plastic waste are dumped into the seas, and with global plastic consumption rising, it is predicted that by 2050, the weight of plastic in the ocean could surpass that of fish. Furthermore, the Covid-19 pandemic has exacerbated the problem, as the extensive use of disposable plastic items (such as masks and gloves) has contributed millions of additional tonnes of plastic waste to the ocean.

Although various treaties and legal instruments address marine plastic pollution, millions of tons of plastic waste continue to be frequently discharged into the ocean. This prompts the question of whether these regulations are sufficient to tackle the problem or if the widespread pollution is a result of inadequate enforcement of existing laws. The rule of law, which is essential for effective ocean governance, requires not only clear legal frameworks but also their proper implementation. Therefore, the issue of marine plastic pollution presents a challenge to upholding the rule of law.

This chapter explores how the rule of law can be strengthened in the regulation of marine-based plastics and microplastics pollution. It reviews the current legal framework in place, identify any gaps, and discuss ways to enhance it to better support the rule of law. Regional and national instruments and policies fall outside the scope of this thesis and are not explored.

The main scope of this chapter is to explain what was the scenario that preceded the launch of the 2022 UNEA Resolution 5/14, which, as it is discussed in Part II of this thesis, changed the scenario regarding the action of international law to combat marine plastic pollution. Before this milestone, many legal gaps remained – and still do, since the instrument dedicated to combating (marine) plastic pollution is not yet finalised.

Thus, the focus is on the analysis of the instruments, and which gaps need to be overcome by the future Global Plastics Treaty. This analysis serves as a background for

the assessment that is conducted in the final section of this chapter, which concludes by stressing that a multilateral treaty addressing plastic pollution is urgently needed.

The research questions that guide this chapter are the following:

- i) How is (marine) plastic pollution currently regulated in international law?
- ii) How do voluntary commitments contribute to the global governance of marine plastic pollution?

The international agreements mentioned in this chapter – and throughout the entire thesis – are interpreted using the principles laid out in the 1969 Vienna Convention on the Law of Treaties (VCLT). The general rule of interpretation provided in Article 31 is that the treaties shall be interpreted “*in good faith in accordance with the ordinary meaning to be given to the terms of the treaty in their context and in the light of its object and purpose*”.

The VCLT offers a text-focused interpretation method, meaning that it is the written text of the treaty that is the main element of interpretation. The text is to be interpreted within its ordinary meaning, unless it is established that the Parties intended to attribute any special meaning to a specific term.

Guiding the assessment of the need for a new multilateral treaty is the extent to which existing instruments can comprehensively address the (marine) plastic pollution issue. This evaluation focuses on identifying the gaps these instruments leave unaddressed, the limitations in their scope, and the reasons why a new treaty is necessary to bridge these deficiencies and provide a more effective, coordinated response.

These gaps can be either factual or normative in nature.

Factual gaps arise when an issue is inadequately addressed or left unresolved. They may be: i) substantive (when no instrument exists to address the issue at hand); ii) legal (when guidelines are available but lack legally binding force); iii) membership-related (when certain parties are excluded from some or all commitments); iv) geographic (when an instrument does not cover all regions); v) institutional (when there is no designated institution, organisation, or mechanism responsible for specific functions); or vi) compliance/enforcement-related (when an agreement exists but its compliance mechanisms are weak or ineffective).

A normative gap occurs when there is a lack of consensus on whether an issue should be addressed at all. For example, while there may be recognition that no existing instrument tackles a specific issue (a substantive gap), there may be disagreement on whether such an instrument is needed in the first place.

In the case of (marine) plastic pollution, the latter has been overcome, as the international community has already agreed to begin negotiations to develop a new LBI dedicated to combating this problem.

It is also crucial to examine whether a gap is the result of a deliberate design choice during the negotiation of a legal instrument. Examples of this include the option to opt out of species regulations under the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), the ability to opt out of the commercial moratorium under the International Whaling Convention, and the non-legally binding targets set forth in the Paris Agreement⁷⁹.

⁷⁹ Urho, N.; *et. al.* (2019). **International Environmental Governance** Accomplishments and Way Forward. Nordic Council of Ministers, p. 79. DOI: <https://doi.org/10.6027/TN2019-518>. Available at: <https://norden.diva-portal.org/smash/record.jsf?pid=diva2%3A1289927&dswid=-3786>. Accessed on 22 March 2022.

2.1.1 *The Patchwork of International Environmental Law: Fragmentation Across Key Treaties*

In addressing marine pollution, the international legal landscape is shaped by both binding agreements and soft law instruments, each playing distinct but complementary roles in governance. This Section explores these two key categories of international law and their contributions to the regulation and management of marine pollution, particularly plastics.

Before delving into the content of fundamental treaties that address the phenomenon of marine plastic pollution, it is important to situate the fragmented context in which they exist – as they do not stand in a vacuum or in isolation but interact with each other, despite often being part of different agendas.

Over the past decades, the reach of international law has grown significantly. Initially focused on regulating formal diplomacy, it has broadened to encompass a wide range of global activities, including trade, environmental protection, human rights, and scientific and technological collaboration. New multilateral institutions, both regional and global, have been established in areas such as commerce, culture, security, and development⁸⁰.

The emergence of new branches that operate independently, cultivating their unique identities and governance structures, exemplifies one dimension of the broader phenomenon known as the fragmentation of international law⁸¹. In fact, this is an interesting and recognising paradox of globalisation: while it has fostered greater uniformity in social life worldwide, it has also contributed to this fragmentation – resulting in the development and diversification of specialised and relatively independent areas of social action and structure (in response to the needs of a pluralistic society)⁸².

The interaction of various international regimes underscores the absence of an overarching structure or hierarchy among their institutions and regulations. This lack of structure or hierarchy constitutes a primary political characteristic of a regime. For instance, the complex climate change regime encompasses numerous mechanisms integral to the UN framework, specifically the UNFCCC and the Kyoto Protocol.

⁸⁰ UNGA (2006). **Fragmentation of International Law**: difficulties arising from the diversification and expansion of International Law. Report of the Study Group of the ILC, p. 3. Available at: https://legal.un.org/ilc/documentation/english/a_cn4_1702.pdf. Accessed on 17 September 2022.

⁸¹ Nwabueze, J.N.; Techera, E. (2021). International Environmental Law and Climate Change. In: **Routledge Handbook of International Environmental Law**. Techera, E.; *et. al.* (eds.), 2nd edition, p. 228-229. ISBN 978-0.367-68503-4.

⁸² UNGA (2006). *Ob. cit.*, p. 4.

Additionally, this regime incorporates specialised agencies within the UN, such as the UN Development Programme (UNDP) and the UN Environment Programme (UNEP), as well as several bilateral and multilateral framework agreements and governance platforms⁸³.

This illustrates the complex network of governance instruments related to climate change while also attesting to the density and plurality of the new instruments introduced⁸⁴. The ocean regime, on its turn, is also characterised by its complexity. UNCLOS is widely acknowledged as the “Constitution of the Oceans”⁸⁵ due to its extensive thematic scope and universal acceptance. It serves as a foundational legislative framework within the Law of the Sea⁸⁶.

UNCLOS may also be regarded as a dynamic instrument, in addition to its comprehensive approach and universality. Its characterisation as a living organism, capable of promoting the looping of “updates”, imposes the reflection on how to balance the legislative evolution necessary in the context of a changing climate and the stability relevant to reliable legal frameworks⁸⁷. This relationship, however, is discussed further in this work, in an appropriate section.

In this scenario, while fragmentation may be seen as a “natural” progression (since international law has always been somewhat “fragmented” due to the diversity of national legal systems involved), there have also consistently been counteracting processes, equally natural, that push in the opposite direction. For instance, general international law has continued to evolve through the implementation of the 1969 Vienna Convention on the Law of Treaties (VCLT)⁸⁸, customary law, and “*general principles of law recognised by civilised nations*”.

⁸³ Zhang, L.; Bai, E. (2023). The Regime Complexes for Global Climate Governance. **Sustainability**, vol. 15, no. 11, p. 4. DOI: <https://doi.org/10.3390/su15119077>. Available at: <https://www.mdpi.com/2071-1050/15/11/9077>. Accessed on 19 January 2024.

⁸⁴ *Ibid.*, p. 7.

⁸⁵ Expression formulated by Tommy T.B. Koh (Singapore), President of the third UN Conference on the Law of the Sea. In: Koh, Tommy T.B. (1982). **A Constitution for the Oceans**. Remarks by the President of the Third United Nations Conference on the Law of the Sea (Dec. 6 & 11, 1982), 5p. Available at: https://www.un.org/depts/los/convention_agreements/texts/koh_english.pdf. Accessed on 18 December 2021.

⁸⁶ For a comprehensive historical overview of the development of UNCLOS, see Proelß, A. (2017). **The United Nations Convention on the Law of the Sea A Commentary**. 1st Edition, Bloomsbury Publishing, 2048 p. ISBN: 9781849461924.

⁸⁷ Jakobsen, I.U.; *et. al.* (2021). The Law of the Sea as Part of the Climate-Change Regime Complex. In: Johansen E, Busch SV, Jakobsen IU, eds. **The Law of the Sea and Climate Change: Solutions and Constraints**. Cambridge University Press, p. 377. ISBN: 9781108907118.

⁸⁸ UN (2005a). **Vienna Convention on the Law of Treaties**. Done at Vienna on 23 May 1969. Entered into force on 27 January 1980. United Nations, Treaty Series, vol. 1155, p. 331. Available at: https://legal.un.org/ilc/texts/instruments/english/conventions/1_1_1969.pdf. Accessed on 18 December 2021.

The fact that numerous treaties embody principles of general international law, and that specific treaty provisions become part of the broader body of international law, reflects the dynamic nature of the system and the inherent drive for legal coherence⁸⁹.

Although fragmentation may be unavoidable, it is essential to have a framework that allows it to be evaluated and addressed. Thus, in this section, we intend to provide what could be a framework to address marine plastic pollution under the scope of international law – without forgetting to mention why this structure is not adequate and is incomplete. As a legal system, international law is not simply a random assortment of norms; there are significant connections between them⁹⁰.

Hence, first, the international binding agreements that deal with marine plastic pollution on a global scale are the primary subject of Subsection A “2.1.1.1”. It should be noted, however, that while binding instruments are crucial for ensuring a legal framework for accountability, their effectiveness often hinges on proper implementation, monitoring, and enforcement mechanisms.

There are different categories of binding agreements relevant to addressing marine plastic litter and microplastics. The principles and rules governing States’ ability to deal with transboundary ocean pollution were first established in UNCLOS. Article 194 of the Convention, included in Part XII of the document, describes a general rule of international law, providing for the obligation to prevent, reduce and control pollution of the marine environment⁹¹.

A notable feature of this provision is its abdication of any damage as a triggering element for the obligations established. The focus of its legal regime is not on liability or obligation for damage to the environment, but on comprehensive regulation to prevent, reduce and control marine pollution⁹².

The general principle of this provision, as regards State liability for damage caused by pollution outside its territory, must be considered as customary law since the Nuclear Test Cases⁹³. The main objective, contained in Article 194, is that States do not

⁸⁹ UNGA (2006). *Ob. cit.*, p. 6.

⁹⁰ *Ibid.*, p. 7.

⁹¹ UN (1982a). **United Nations Convention on the Law of the Sea**. Montego Bay, December 10th, 1982. Entry into force on 16 November 1994. Available at: https://www.un.org/depts/los/convention_agreements/texts/unclos/unclos_e.pdf. Accessed on 23 January 2022.

⁹² Proelß, A. (2017). *Ob. cit.*, p. 1299.

⁹³ Judge de Castro cited this formulation as a rule of customary law in his dissent in the International Court of Justice, Nuclear Tests (Australia v. France), judgment of 20 December 1974, ICJ Reports (1974). In: ICJ (1974). **Nuclear Tests (Australia v. France)**. Judgment of 20 December 1974 – Dissenting Opinion of Judge de Castro, p. 388-389. Available at: <https://www.icj-cij.org/public/files/case-related/58/058-19741220-JUD-01-08-EN.pdf>. Accessed on 23 January 2022.

cause damage by pollution, but if pollution does occur, the intention is that it does not spread beyond the areas of jurisdiction of a given State. This obligation of conduct, according to the ITLOS Sub-Regional Fisheries Commission Advisory Opinion of 2015, requires “due diligence” in the sense of a State not only adopting appropriate rules and measures, but also some level of vigilance in their application and in the exercise of administrative control⁹⁴.

This understanding was adopted by the Arbitral Tribunal in the South China Sea Arbitration, whose award was dated July 12, 2016. The award reiterates a duty of due diligence that translates into the duty of States to ensure that activities within their jurisdiction and control respect the environment of other States or of areas beyond their national control, and that States have a positive duty to prevent or mitigate significant damage to the environment when engaging in large-scale construction activities, as opposed to a negative duty to refrain from degrading the environment. The award also went a long way in confirming that Part XII of UNCLOS can evolve through interpretation and the duty of cooperation⁹⁵.

In this sense, the International Tribunal for the Law of the Sea (ITLOS) has already emphasised that the duty to cooperate constitutes a fundamental principle in the prevention of pollution of the marine environment under Part XII of the Convention and general international law⁹⁶. The interaction of UNCLOS with other treaty regimes indicates its unique character as a living instrument. Although it is considered the Constitution of the Ocean, its interpretation and application are considered flexible and responsive to emerging problems⁹⁷.

Other standards interact with UNCLOS when it comes to pollution of the marine environment, presenting specific provisions relating to pollution from different sources, and there are instruments geared towards or related to pollution, such as the London

⁹⁴ Proelß, A. (2017). *Ob. cit.*, p. 1305-1306.

⁹⁵ Kojima, C. (2015). South China Sea Arbitration and the Protection of the Marine Environment: Evolution of UNCLOS Part XII Through Interpretation and the Duty to Cooperate. **Asian Yearbook of International Law**, vol. 21, p. 166-171. ISBN: 9789004344556. Publisher: Brill | Nijhoff. DOI: https://doi.org/10.1163/9789004344556_010. Available at: https://brill.com/display/book/edcoll/9789004344556/B9789004344556_010.xml. Accessed on 27 April 2022.

⁹⁶ PCA (2016). **The South China Sea Arbitration**. Award of 12 July 2016. PCA Case N° 2013-19 in the matter of the South China Sea arbitration - before - an Arbitral Tribunal constituted under Annex VII to the 1982 United Nations Convention on the Law of the Sea - between - the Republic of the Philippines - and - the People's Republic of China. Arbitral Tribunal: Judge Thomas A. Mensah (Presiding Arbitrator) Judge Jean-Pierre Cot Judge Stanislaw Pawlak Professor Alfred H.A. Soons Judge Rüdiger Wolfrum. Available at: <https://pcacases.com/web/sendAttach/2086>. Accessed on 29 April 2022.

⁹⁷ Kojima, C. (2015). *Ob. cit.*, p. 170.

Convention and Protocol⁹⁸; mechanisms aimed at biodiversity or species, such as the Convention on Biological Diversity (CBD)⁹⁹; and agreements on chemicals and waste¹⁰⁰, such as the Basel, Rotterdam and Stockholm Conventions¹⁰¹.

In addition to these, the scope of this research encompasses – and they are therefore examined – the International Convention for the Prevention of Pollution from Ships (MARPOL), the Convention on the Conservation of Migratory Species of Wild Animals (CMS), the Convention on the Law of the Non-navigational Uses of International Watercourses (UNWC) and the Convention on the Protection and Use of Transboundary Watercourses and International Lakes Water Convention (UNECE Water Convention).

Finally, in Subsection B “2.1.1.2”, the attention shifts to soft law instruments, which, though not legally binding, still influence international and national policymaking through voluntary commitments, guidelines, and principles. Soft law instruments play a significant role in fostering cooperation among States, industries, and other stakeholders, especially when legally binding mechanisms face limitations or delays in adoption. These instruments are vital in shaping best practices, encouraging innovation, and supporting the transition toward more sustainable practices in marine pollution management.

⁹⁸ The Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, 1972, abbreviated as the “London Convention”, is one of the first global conventions to protect the marine environment from human activities and has been in force since 1975. Its objective is to promote the effective control of all sources of marine pollution and to take all possible measures to prevent pollution of the sea by dumping of wastes and other materials. 87 States are currently Parties to the Convention. In: IMO (1972). **Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter**. Entry into force on 30 August 1975. Available at: <https://www.cdn.imo.org/localresources/en/OurWork/Environment/Documents/LC1972.pdf>. Accessed on 15 May 2022.

⁹⁹ The Convention on Biological Diversity entered into force on December 29, 1993, and has three main objectives: the conservation of biological diversity; the sustainable use of components of biological diversity; and the fair and equitable sharing of benefits arising from the utilization of genetic resources. In: UNEP (2011a). **Convention on Biological Diversity**. Text and Annexes - Secretariat of the Convention on Biological Diversity, Montreal. “This publication contains the text and annexes of the Convention on Biological Diversity, first adopted 22 May 1992”. Entry into force on 29 December 1993. Available at: <https://www.cbd.int/doc/legal/cbd-en.pdf>. Accessed on 15 May 2022.

¹⁰⁰ In this regard, Part II of this thesis demonstrates that even with the start of the negotiations for the future LBI on plastics, the danger and hazardousness of plastics continues to be one of the elements to be included in the final text – that is, provisions that recognise the toxicity of plastic due to its chemical composition, the effects of which are harmful to human health. In: UNEP (2022b). *Ciencia de los plásticos*. Comité intergubernamental de negociación encargado de elaborar un instrumento internacional jurídicamente vinculante sobre la contaminación por plásticos, en particular en el medio marino. Primer período de sesiones Punta del Este, Uruguay, 28 de noviembre a 2 de diciembre de 2022 (UNEP/PP/INC.1/7). Available at: <https://wedocs.unep.org/bitstream/handle/20.500.11822/41170/K2221533%20-%20UNEP-PP-INC.1-7%20-%20ES.pdf?sequence=1&isAllowed=y>. Accessed on 13 January 2023.

¹⁰¹ UNEP (2017a). **Combating marine plastic litter and microplastics**: an assessment of the effectiveness of relevant international, regional and subregional governance strategies and approaches. Authors: Dr. Karen Raubenheimer, Dr. Nilüfer Oral, Prof. Alistair McIlgorm. Nairobi, p. 22. Available at: https://apps1.unep.org/resolutions/uploads/unep_aheg_2018_inf3_full_assessment_en.pdf. Accessed on 17 May 2022.

Together, binding agreements and soft law instruments form an integrated approach to tackling marine pollution, each addressing different aspects of the issue but ultimately contributing to a shared goal of protecting and preserving marine ecosystems for future generations.

2.1.1.1 Regulation of Plastic Pollution in International Law: The Analysis of Binding Instruments

This section begins by reviewing international environmental law instruments that are relevant to addressing marine plastic pollution. The approach given is problem-oriented, focusing on the instruments most pertinent to this issue.

Several international frameworks and agreements are in place to address plastic pollution and marine litter, particularly from land-based sources. These include initiatives within the 2030 Agenda for Sustainable Development (more specifically through SDG 14)¹⁰², as well as legally binding agreements, conventions, protocols, and collaborative processes¹⁰³.

Key agreements include the UNCLOS, which is the only binding treaty that regulates land-based sources of marine plastic pollution; the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes, which more recently became a key instrument in addressing the plastic pollution phenomenon; the Stockholm Convention on Persistent Organic Pollutants (POPs); the Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade¹⁰⁴; the London Convention and its Protocol (which aims to prevent the dumping of waste, including plastics, into the marine environment); the International Convention for the Prevention of Pollution from Ships (MARPOL) which prohibits the discharge of plastics into the ocean; the Convention on Biological Diversity (CBD) and the Convention on the Conservation of Migratory Species of Wild Animals (CMS), both of which address the impact of plastics on marine biodiversity and species; and finally, the Convention on the Law of the Non-navigational Uses of International Watercourses (UNWC) and the Convention on the Protection and Use of Transboundary Watercourses and International Lakes Water Convention (UNECE Water Convention), which are part of the law of international watercourses and provide important foundational frameworks that can be further expanded and progressively developed by the parties involved – considering that many plastics entering the ocean come from rivers.

¹⁰² UNGA (2015). **70/1. Transforming our world: the 2030 Agenda for Sustainable Development**. Resolution adopted by the General Assembly on 25 September 2015 (A/RES/70/1). Available at: <https://documents.un.org/doc/undoc/gen/n15/291/89/pdf/n1529189.pdf>. Accessed on 23 February 2023.

¹⁰³ UNEP (2017a). *Ob. cit.*, p. 26.

¹⁰⁴ Raubenheimer, K.; McIlgorm, A.; Oral, N. (2018). Towards an improved international framework to govern the life cycle of plastics. **RECIEL - Review of European, Comparative & International Environmental Law**, vol. 27, n. 3. Special Issue: Plastics Regulation. DOI: <https://doi.org/10.1111/reel.12267>. Available at: <https://onlinelibrary.wiley.com/doi/10.1111/reel.12267>. Accessed on 21 February 2023.

Additionally, other international agreements and non-binding instruments are pertinent, but these are analysed in Subsection B “2.1.1.2”.

This Subsection, instead, presents an overview of a representative sample of international conventions, revealing that some legal instruments could indirectly have some influence over the fight against plastic pollution. None of the analysed conventions, however, directly address the central issue of this contribution – considering a broader view that encompasses the entire life cycle of plastics.

- *United Nations Convention on the Law of the Sea (UNCLOS)*

The first of the international instruments that must necessarily be addressed is the UNCLOS, also known as the 1982 Montego Bay Convention – or even the “Constitution for the Oceans”. This instrument is in force from 16 November 1994¹⁰⁵ and counts with 170 State Parties¹⁰⁶.

UNCLOS was a landmark for the law of the sea and international environmental law, as it contains provisions with a specific purpose for the protection of the ocean. It sets out a legal framework to manage all activities carried out in the world’s seas and contains unprecedented legal definitions of marine morphological and geological features, as well as detailed rules of the law of the sea, establishing a cohesive environmental conservation regime¹⁰⁷.

The evolution brought about by UNCLOS has also led international actors to realise that the ocean – in spatial terms the open sea area – is a “global common” or a “common good”, and not “nobody’s good”, and it is therefore subject to regulation¹⁰⁸.

While the preamble and Article 192 establish a general duty for states to “protect and preserve the marine environment”, more specific obligations regarding marine pollution are outlined in Article 194 of the UNCLOS. The Convention, however, does not directly address the control of marine plastic pollution in its text.

Initially, UNCLOS Article 1(4) defines “pollution of the marine environment” as

¹⁰⁵ ISA (2022). The United Nations Convention on the Law of the Sea at 40. Available at : <https://www.isa.org.jm/unclos-at-40-2/#:~:text=On%2016%20November%201994%2C%20UNCLOS,the%20common%20heritage%20of%20humankind>. Accessed on 15 April 2023.

¹⁰⁶ UN Treaty Collection (2024d). 6. United Nations Convention on The Law of The Sea. Montego Bay, 10 December 1982. United Nations, Treaty Series, vol. 1833, p. 3; depositary notifications C.N.236.1984. Available at: https://treaties.un.org/pages/ViewDetailsIII.aspx?src=TREATY&mtdsg_no=XXI-6&chapter=21&Temp=mtdsg3&clang=_en. Accessed on 17 November 2024.

¹⁰⁷ UN (1982a). *Ob. cit.*, n.p.

¹⁰⁸ Zanella, T. V. (2013). *Poluição Marinha por Plásticos e o Direito Internacional do Meio Ambiente. Revista do Instituto de Direito Brasileiro*, nº 12, p. 14473-14500. ISSN: 2182-7567. Available at: https://www.cidp.pt/revistas/ridb/2013/12/2013_12_14473_14500.pdf. Accessed on 15 October 2023.

(...) the introduction by man, directly or indirectly, of substances or energy into the marine environment, including estuaries, which 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 amenities¹⁰⁹.

The Convention, thus, offers a broad definition of pollution of the marine environment that could encompass all sources of marine pollution, both in the present and in the future. Provisions relating to pollution can, hence, include plastics discarded into the ocean – as they are a “substance” introduced into the marine environment by humans¹¹⁰.

Plastic litter and microplastics in the ocean would also meet the criteria of causing, or potentially causing, harmful effects as outlined in the article, given the growing body of scientific evidence highlighting the dangers that plastic pollution poses to humans, animals, and ecosystems¹¹¹.

Thus, there seems to be space to argue that the definition of marine pollution in Article 1 would encompass plastics, as it should currently be interpreted and applied with consideration of the precautionary approach¹¹².

Measures to prevent, reduce and control pollution of the marine environment are governed by Article 194, which provides that States must take, individually or jointly as appropriate, all measures in accordance with the UNCLOS to achieve these three different objectives, from whatever source, using to this end the most adequate means available to them – according to their capabilities – and must endeavour to harmonise their policies in this area¹¹³.

This refers to what is known as a due diligence standard of care. The specific details of this standard, however, can be challenging to define in exact terms. It represents an obligation focused on conduct rather than outcome, as stated by the International

¹⁰⁹ UN (1982a). *Ob. cit.*, n.p.

¹¹⁰ Proelß, A. (2017). *Ob. cit.*, p. 23.

¹¹¹ Jeong, E.; Lee, J.Y.; Redwan, M. (2024). Animal exposure to microplastics and health effects: A review. **Emerging Contaminants**, vol. 10, n. 4, 100369, ISSN 2405-6650, DOI: <https://doi.org/10.1016/j.emcon.2024.100369>. Available at: <https://www.sciencedirect.com/science/article/pii/S2405665024000702>. Accessed on 17 November 2024.

¹¹² Proelß, A. (2017). *Ob. cit.*, p. 23.

¹¹³ UN (1982a). *Ob. cit.*, n.p.

Tribunal for the Law of the Sea's (ITLOS) Seabed Disputes Chamber¹¹⁴ in its 2011 Advisory Opinion¹¹⁵.

Article 194 illustrates the historical change in the approach to marine environmental protection. Previously, States had significant discretion in deciding whether and how to prevent, control, and regulate marine pollution. Under the Convention, instead, they are now primarily required to do so in accordance with its provisions¹¹⁶.

The Convention provides in Article 194 (2) that States Parties have a duty to take the necessary measures to ensure that activities under their jurisdiction do not cause damage to other States, and that pollution caused by accidents in such activities does not extend to areas outside its sovereignty. This obligation of States to avoid causing environmental harm in areas beyond their jurisdiction existed prior to the Stockholm Conference and UNCLOS III. This duty, commonly referred to as the “no harm” principle, was first established in the Trail Smelter Arbitration¹¹⁷.

The general principle of this provision concerning State responsibility for pollution damage beyond their territory should be considered customary law, as established in the Nuclear Test Cases¹¹⁸.

Article 194 (2) developed from Principle 21 of the Stockholm Declaration, which asserts that States have

(...) the sovereign right to exploit their own resources pursuant to their own environmental policies, and the responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other

¹¹⁴ UNCLOS, Art. 191 “The Seabed Disputes Chamber shall give advisory opinions at the request of the Assembly or the Council on legal questions arising within the scope of their activities. Such opinions shall be given as a matter of urgency.”

¹¹⁵ ITLOS (2011). **Responsibilities and obligations of States sponsoring persons and entities with respect to activities in the Area**. Request for Advisory Opinion submitted to the Seabed Disputes Chamber - List of cases: No. 17, paragraph. 110. Available at: https://www.itlos.org/fileadmin/itlos/documents/cases/case_no_17/17_adv_op_010211_en.pdf. Accessed on 22 September 2023.

¹¹⁶ Proelß, A. (2017). *Ob. cit.*, p. 1298.

¹¹⁷ As the award reads: “As Professor Eagleton puts in (Responsibility of States in International Law, 1928, p. 80): ‘A State owes at all times a duty to protect other States against injurious acts by individuals from within its jurisdiction’. A great number of such general pronouncements by leading authorities concerning the duty of a State to respect other States and their territory have been presented to the Tribunal. These and many others have been carefully examined. International decisions, in various matters, from the Alabama case onward, and also earlier ones, are based on the same general principle, and, indeed, this principle, as such, has not been questioned by Canada”. In: UN (2006). **Trail smelter case (United States, Canada)**. Reports of International Arbitral Awards, 16 April 1938 and 11 March 1941. Vol. III, p. 1963. Available at: https://legal.un.org/riaa/cases/vol_iii/1905-1982.pdf. Accessed on 22 September 2023.

¹¹⁸ The majority of scholars recognise this formulation as a customary law rule, and Judge de Castro referenced it in his dissent in ICJ, Nuclear Tests (Australia v. France), Merits, Judgment of 20 December 1974, ICJ Reports (1974). In: ICJ (1974). *Ob. cit.*, p. 388.

States or of areas beyond the limits of national jurisdiction¹¹⁹.

This responsibility to “ensure” is an obligation of conduct. It implies that Articles 192 and 194 establish responsibilities not only for actions directly undertaken by States and their authorities but also for ensuring that activities within their jurisdiction and control do not impact the marine environment¹²⁰.

Subsequently, all sources of pollution in the marine environment shall be addressed, with the Article 194(3) specifically citing

(...) a) the release of toxic, harmful or noxious substances, especially those which are persistent, from land-based sources, from or through the atmosphere or by dumping; b) pollution from vessels, in particular measures for preventing accidents and dealing with emergencies, ensuring the safety of operations at sea, preventing intentional and unintentional discharges, and regulating the design, construction, equipment, operation and manning of vessels; (...) ¹²¹.

“Toxic, harmful or noxious substances” would, thus, encompass plastic litter as well as microplastics – which is comprehensive but at the same time limiting, since it would include only those plastics that fit into that list of specific kinds of pollutions.

Plastic pollution primarily originates from land-based sources, although it also comes from ships, both through their operations and dumping ¹²². This means that UNCLOS could address all sources of plastic pollution in the marine environment.

States are therefore required to prevent, reduce, and control plastic pollution: prevention involves actions aimed at stopping plastics from entering the environment in the first place, such as ensuring effective waste management systems; whereas reducing pollution involves efforts to minimise the pollution that has already occurred, for example, through clean-up actions. It is, however, insufficient to simply implement measures if they do not have a meaningful impact on prevention, reduction, and control. States must take “every” necessary measure to achieve these goals¹²³.

¹¹⁹ UN (1973). **Declaration of the United Nations Conference on the Human Environment**. Report of the United Nations Conference on the Human Environment, Stockholm, 5-16 June 1972. Available at: <https://documents.un.org/doc/undoc/gen/nl7/300/05/pdf/nl730005.pdf>. Accessed on 22 September 2023.

¹²⁰ Proelß, A. (2017). *Ob. cit.*, p. 1306.

¹²¹ UNCLOS, Article 194 (3) “a” and “b”.

¹²² UNEP (2021d). **Neglected: Environmental Justice Impacts of Marine Litter and Plastic Pollution**. Nairobi, p. 46. ISBN: 978-92-807-3852-0. Available at: <https://wedocs.unep.org/xmlui/bitstream/handle/20.500.11822/35417/EJIPP.pdf>. Accessed on 17 September 2023.

¹²³ Punka, A.K. (2023). **Towards an effective global plastics treaty** - A legal analysis of treaty design elements to promote participation and effectiveness. Master thesis presented to the *Universitetet i Oslo (UiO)* Det juridiske fakultet, p. 39. Available at: <https://www.duo.uio.no/bitstream/handle/10852/104616/218.pdf?sequence=1&isAllowed=y>. Accessed on 19 August 2024.

This obligation, still, is somewhat constrained by the requirement that actions must be taken using the “*best practicable means at their disposal*” and “*in accordance with their capabilities*”¹²⁴, which effectively limits the obligations to those operations that provide the greatest benefits or cause the least harm, at a reasonable cost.

Article 194 (4) formulation outlines a general principle of international law rather than representing a specific action towards implementation¹²⁵. It emphasises that “*States shall refrain from unjustifiable interference with activities carried out by other States (...)*”¹²⁶.

Article 194 (5), on its turn, accentuates that measures addressing pollution must include

(...) those necessary to protect and preserve rare or fragile ecosystems as well as the habitat of depleted, threatened or endangered species and other forms of marine life¹²⁷.

Such disposition suggests that State Parties would need to implement measures to tackle plastic pollution, including pollution proven to harm endangered species such as turtles and migratory birds¹²⁸.

It is interesting noting that this provision was first introduced in 1978 in the Informal Composite Negotiating Text (ICNT), being named as the “ecosystem clause” of the Convention – in fact, for the first time the terms “ecosystem” and “habitat” were incorporated to UNCLOS¹²⁹.

Article 194 (5) indicates that measures aimed at protecting biodiversity as a primary objective are permitted and are considered part of the necessary protective

¹²⁴ UNCLOS, Article 194 (1).

¹²⁵ Proelß, A. (2017). *Ob. cit.*, p. 1298.

¹²⁶ UNCLOS, Article 194 (4).

¹²⁷ UNCLOS, Article 194 (5).

¹²⁸ Besides being ingested by many species of marine animals, such as sea turtles, plastics also have the potential to serve as carriers of heavy metals, which could result in a combined toxic effect. In: Darmon, G.; *et. al.* (2022). Drivers of litter ingestion by sea turtles: Three decades of empirical data collected in Atlantic Europe and the Mediterranean. **Marine Pollution Bulletin**, vol. 185, Part B, p. 2. DOI: <https://doi.org/10.1016/j.marpolbul.2022.114364>. Available at:

<https://www.sciencedirect.com/science/article/pii/S0025326X22010463>. Accessed on 13 September 2023.

¹²⁹ UN (2009). **Third United Nations Conference on the Law of the Sea (1973–1982)**. Sixth Session (New York, 23 May to 15 July 1977), Volume VIII: Informal Composite Negotiating Text (https://legal.un.org/diplomaticconferences/1973_los/vol8.shtml) - Third United Nations Conference on the Law of the Sea, 1973-82 (A/CONF.62/WP.10/Rev.1). Available at: https://legal.un.org/diplomaticconferences/1973_los/docs/english/vol_8/a_conf62_wp10_rev1.pdf. Accessed on 16 November 2023.

actions. As the Arbitral Tribunal¹³⁰ noted in the 2015 Chagos Case and reaffirmed in the 2016 South China Sea Arbitration

Article 194 is accordingly not limited to measures aimed strictly at controlling pollution and extends to measures focussed primarily on conservation and the preservation of ecosystems¹³¹.

This provision, as discussed in the South China Sea Arbitration, gives specific form to the duties arising from Article 192 in relation to fragile ecosystems¹³². These obligations focus on preventing harm to species and habitats and may include the establishment of marine protected areas (MPAs)¹³³.

The obligations concerning marine environmental protection and pollution control, under UNCLOS, as examined, are not detailed in nature, which is typical for a general framework convention¹³⁴.

The Convention, nonetheless, offers various tools that can be used to further develop the general obligations related to specific pollution sources, including those from land-based sources (Article 207), by dumping (Article 210), from vessels (Article 211), pollution from or through the atmosphere (Article 212), as well as pollution linked to seabed activities (Article 208) and activities in the Area (Article 209)¹³⁵.

States are also required to implement national laws and regulations to address marine pollution, coordinate their efforts, and collaborate in creating global initiatives to protect and preserve the marine environment. UNCLOS provides comprehensive enforcement mechanisms for various pollution sources in Articles 213 to 222¹³⁶.

Article 146 of UNCLOS on the protection of human life is another relevant device for the case of plastic pollution, as scientific studies are progressively concluding that plastics contain and release harmful chemicals, including endocrine-disrupting chemicals (EDCs) which pose a risk to human health¹³⁷.

¹³⁰ Constituted under Annex VII of the UNCLOS, Article 1 “(...) any party to a dispute may submit the dispute to the arbitral procedure provided for in this Annex by written notification addressed to the other party or parties to the dispute. The notification shall be accompanied by a statement of the claim and the grounds on which it is based”.

¹³¹ PCA (2015). **The Chagos Marine Protected Area Arbitration** (The Republic of Mauritius and the United Kingdom of Great Britain and Northern Ireland). Award of the Arbitral Tribunal constituted under Annex VII of the United Nations Convention on the Law of the Sea, of 18 March 2015. Available at: <https://files.pca-cpa.org/pcadocs/MU-UK%2020150318%20Award.pdf>. Accessed on 16 July 2024.

¹³² PCA (2016). *Ob. cit.*, paragraph 945; and PCA (2015). *Ob. cit.*, paragraph 538.

¹³³ Proelß, A. (2017). *Ob. cit.*, p. 1298.

¹³⁴ Punka, A.K. (2023). *Ob. cit.*, p. 40.

¹³⁵ UN (1982a). *Ob. cit.*, n.p.

¹³⁶ *Ibidem*.

¹³⁷ Endocrine Society; IPEN (2020). **Plastics, EDCs & Health**: a guide for public interest organizations and policy-makers on endocrine disrupting chemicals & plastics. Available at: https://www.endocrine.org/-/media/endocrine/files/topics/edc_guide_2020_v1_6chqennew-version.pdf. Accessed on 11 June 2023.

The Montego Bay Convention is the sole international instrument that establishes legally binding obligations for States concerning the prevention, reduction, and control of pollution from land-based sources. It was, in fact, UNCLOS that introduced, for the first time, the differentiation between land and marine sources of pollution. Previous Conventions only provided for the control of in-site sources, i.e. sources from ships or other physical structures located at sea. Differentiating land and marine sources is very important to control plastic pollution, bearing in mind that 80% of this material in the ocean comes from sources located on continents¹³⁸.

The broad scope of UNCLOS offers significant opportunities to regulate plastic pollution within its framework. The analysed articles provide clear foundational obligations for States regarding pollution – including plastic.

Additionally, it features a well-developed compliance mechanism, enabling disputes to be submitted to the ICJ, the ITLOS, or a tribunal established under the Convention¹³⁹.

The ongoing failure to effectively manage widespread plastic pollution could be seen as a violation of the State Parties' obligations under UNCLOS – considering that marine plastic pollution could fall under either the provisions of Article 194 or Article 207 –, due to the absence of global regulations on plastic pollution and the insufficient outcomes of existing domestic regulations.

Although the obligation in Article 207 (1) emphasises the need for “effort” rather than specific results – requiring States to adopt laws “*to prevent, reduce, and control pollution of the marine environment*” instead of mandating the actual prevention, reduction, and control of pollution –, other provisions in the UNCLOS are formulated in a way that actually encourages effort aimed at achieving specific outcomes – or that are result-oriented¹⁴⁰.

Article 207 (2) states that Parties to the Convention “*shall take other measures as may be necessary to prevent, reduce and control such pollution*”¹⁴¹. Additionally, the general obligation in Article 194 requires States to take “*all measures*” deemed “*necessary to prevent, reduce, and control pollution of the marine environment from any*

¹³⁸ Harris, P.G. (2022). **Routledge Handbook of Marine Governance and Global Environmental Change**. 1st Edition, Routledge: London. ISBN: 9781315149745, 342p. Available at: <https://www.taylorfrancis.com/books/edit/10.4324/9781315149745/routledge-handbook-marine-governance-global-environmental-change-paul-harris>. Accessed on 14 April 2023.

¹³⁹ Punka, A.K. (2023). *Ob. cit.*, p. 40.

¹⁴⁰ *Ibid.*, p. 41.

¹⁴¹ UN (1982a). *Ob. cit.*, n.p.

source”¹⁴².

It is suggested, yet, that this provision may be limited due to its reference to “internationally agreed rules, standards and recommended practices and procedures”¹⁴³, which are often absent, rendering the due diligence standard broad and somewhat unclear. Also, despite benefiting from a sophisticated compliance mechanism with the ITLOS, the gap in addressing plastic pollution, coupled with the broad and vague obligations in Article 207 of UNCLOS, have hindered the Convention from making a significant impact on fighting the plastic pollution phenomenon¹⁴⁴.

In this scenario, one might wonder how diligent a State would need be to fulfil the obligation of “taking all necessary measures”?

Addressing the entirety of the plastic pollution phenomenon is a too vast task for any single State, making it difficult to determine what level of action is required for compliance under the Convention. Besides, the obligation of due diligence is a fundamental element of customary international environmental law, but its broad and vague nature makes it challenging to define its exact requirements and determine whether it has been violated¹⁴⁵.

While dispute settlement mechanisms within the UNCLOS framework are available and relatively advanced¹⁴⁶, they rely on one State bringing a dispute against another – environmental disputes seldom lead to litigation, and even more infrequently in an interstate context¹⁴⁷. This may not be well-suited for addressing a challenge such as plastic pollution, where the cumulative lack of action from multiple States contributes to the severity of the problem. Determining liability¹⁴⁸ or even proving that damage has occurred can be challenging and, additionally, the dispute resolution process can be

¹⁴² UNCLOS, Article 194.

¹⁴³ UNCLOS, Article 207 (1).

¹⁴⁴ Carlini, G.; Kleine, K. (2018). Advancing the international regulation of plastic pollution beyond the United Nations Environment Assembly resolution on marine litter and microplastics. **RECIEL - Review of European, Comparative & International Environmental Law**, vol. 27, n. 3, Special Issue:Plastics Regulation, p. 236. DOI: <https://doi.org/10.1111/reel.12258>. Available at: <https://onlinelibrary.wiley.com/doi/10.1111/reel.12258>. Accessed on 10 August 2024.

¹⁴⁵ Laganière, G. (2022). **Liability for transboundary pollution at the intersection of public and private international law**. Oxford, UK: Hart Publishing, an imprint of Bloomsbury Publishing, p. 24. ISBN: 978-1-50995-115-4.

¹⁴⁶ Part XV – Settlement of Disputes, Art. 279 et seq.

¹⁴⁷ Laganière, G. (2022). *Ob. cit.*, p. 24.

¹⁴⁸ State responsibility involves the breach of an obligation under international law, typically derived from treaties, customary international law, or general principles of international law. In contrast, state liability refers to the compensation for damage without the presence of a wrongful act. This concept addresses the transboundary risks linked to lawful activities within a state’s territory, including those carried out by private entities. Transboundary pollution is a key example, as it results from activities that may not be illegal or inherently harmful, such as energy production. In: Laganière, G. (2022). *Ob. cit.*, p. 22-23.

prolonged and expensive¹⁴⁹.

Given the absence of less confrontational non-compliance mechanisms within UNCLOS – when comparing to other non-compliance mechanisms in MEAs, which are based on monitoring and reporting on concrete actions (e.g., tracking production and consumption of ozone-depleting substances under the Montreal Protocol¹⁵⁰) –, addressing non-compliance actions from the Parties becomes problematic. This, once again, highlights the lack of clear, measurable obligations regarding pollution control under the Convention¹⁵¹.

Nevertheless, since UNCLOS addresses marine pollution from all sources, it presents itself as what would be a suitable framework for addressing plastic pollution.

For instance, this could be achieved by adopting a new implementing agreement, similar to the Agreement relating to the implementation of Part XI of UNCLOS¹⁵², the recently concluded BBNJ Agreement¹⁵³, or even the 1995 United Nations Fish Stocks

¹⁴⁹ Section 1 stipulates that the compulsory procedures under UNCLOS can only be invoked after States have exhausted their preferred means, including those outlined in other conventions. Additionally, Section 3 of Article 297(2) and (3) categorically exclude certain disputes from the jurisdiction of the dispute settlement bodies in all cases, while Article 298 allows states to exclude disputes related to maritime boundaries, historic rights, and law enforcement activities at sea through an optional declaration. The preference given to other settlement procedures over the UNLOS system in Section 1, combined with the exclusions in Section 3, has led to concerns about the true compulsory nature of the dispute settlement system. These exceptions and limitations in Section 3, along with the procedural obstacles in Section 1, establish jurisdictional restrictions, thereby creating legal uncertainty for States when deciding whether to resort to the compulsory dispute settlement procedures. Nonetheless, some scholars argue that the dispute settlement system under UNCLOS holds significant potential and could play a crucial role in resolving long-standing territorial and maritime disputes, especially in Asia. In: Nguyen, L. N. (2017). The UNCLOS Dispute Settlement System: What Role Can It Play in Resolving Maritime Disputes in Asia? *Asian Journal of International Law*, vol. 8, n. 1, p. 20-21. DOI:10.1017/S204425131600031X. Available at: <https://www.cambridge.org/core/journals/asian-journal-of-international-law/article/abs/unclos-dispute-settlement-system-what-role-can-it-play-in-resolving-maritime-disputes-in-asia/A842AD7E3E49F1FA7E4E5CEE765E06FC>. Accessed on 17 April 2023.

¹⁵⁰ UN (1989). **Montreal Protocol on Substances that Deplete the Ozone Layer**. Concluded at Montreal on 16 September 1987. Available at: <https://treaties.un.org/doc/publication/unts/volume%201522/volume-1522-i-26369-english.pdf>. Accessed on 14 April 2023.

¹⁵¹ Although UNCLOS does have a reporting system, it is confined to specific issues, such as certain types of baselines, maritime boundaries, and the outer limits of the EEZ and continental shelf (see Arts. 16, 47(9), 75, 76(9), and 84). These matters must be reported to the UN Secretary-General, who, however, does not have the authority to assess the information for compliance with UNCLOS. In: Punka, A.K. (2023). *Ob. cit.*, p. 41.

¹⁵² UNGA (1994). **Agreement relating to the Implementation of Part XI of the United Nations Convention on the Law of the Sea of 10 December 1982**. Forty-eighth session Agenda item 36 Resolution adopted by the General Assembly (A/RES/48/263). Available at: <https://digitallibrary.un.org/record/161900?v=pdf>. Accessed on 18 August 2024.

¹⁵³ The BBNJ Agreement is now the third implementing agreement to the UNCLOS. In: UN (2023a). **Agreement under the United Nations Convention on the Law of the Sea on the Conservation and Sustainable Use of Marine Biological Diversity of Areas Beyond National Jurisdiction**. Adopted on 19 June 2023. Available at: <https://www.un.org/bbnjagreement/en/bbnj-agreement/text-bbnj-agreement>. Accessed on 13 August 2024.

Agreement (UNFSA)¹⁵⁴ – which demands the reduction of waste, discards, and catches resulting from abandoned, lost or otherwise discarded fishing gear (ALDFG), the majority of which is composed of plastics¹⁵⁵. Besides, the UNFSA emphasises the conservation and management of straddling fish stocks and highly migratory fish stocks, both within national jurisdictions and in areas beyond them¹⁵⁶.

The primary benefit of such an approach – adopting a new implementing agreement – is that State Parties would not need to begin entirely from scratch, avoiding the time and resource costs associated with starting a future treaty – rather, the objectives and principles of UNCLOS would guide the new instrument¹⁵⁷.

This implementing agreement could be ratified by States that are not Parties to UNCLOS, such as the United States of America and Turkey¹⁵⁸. That said, there is a risk that a new agreement under an existing regime could inherit some of its less favourable aspects, such as the vagueness of UNCLOS or certain States' unwillingness to join the original agreement¹⁵⁹.

To illustrate, for instance, the UNCLOS encourages a cooperative approach, requiring States to

endeavour to establish global and regional rules, standards and recommended practices and procedures to prevent, reduce and control pollution of the marine environment from land-based sources, taking into account characteristic regional features, the economic capacity of developing States and their need for economic development. Such rules, standards and recommended practices and procedures shall be re-examined from time to time as necessary¹⁶⁰.

However, the implementation of such approach has been inconsistent, with only

¹⁵⁴ UN (2019). The United Nations Fish Stocks Agreement. Division for Ocean Affairs and the Law of the Sea - UNFSA Overview (the United Nations Agreement for the Implementation of the Provisions of the UNCLOS relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks). Available at: <https://www.un.org/oceancapacity/unfsa>. Accessed on 3 August 2024.

¹⁵⁵ Manyara, P.; Raubenheimer, K.; Sadan, Z. (2022). Legal and Policy Frameworks to Address Marine Litter Through Improved Livelihoods. In: **The African Marine Litter Outlook**. Editors Thomas Maes, Fiona Preston-Whyte, Springer Cham, p. 142. DOI: <https://doi.org/10.1007/978-3-031-08626-7>. Available at: https://link.springer.com/chapter/10.1007/978-3-031-08626-7_4. Accessed on 7 August 2024.

¹⁵⁶ Raubenheimer, K.; McIlgorm, A.; Oral, N. (2018). *Ob. cit.*, p. 214.

¹⁵⁷ Punka, A.K. (2023). *Ob. cit.*, p. 42.

¹⁵⁸ The non-parties consist of a minority of states, including the United States of America, Colombia, Israel, Peru, Turkey, and Venezuela. The United States of America, for instance, even though not being a Party to the UNCLOS, has ratified the Agreement for the implementation of the provisions of the Convention of 10 December 1982 relating to the conservation and management of straddling fish stocks and highly migratory fish stocks in 1996. In: UN (2024a). Chronological lists of ratifications of, accessions and successions to the Convention and the related Agreements. Oceans & Law of the Sea – Division for Ocean Affairs and the Law of the Sea. Available at: https://www.un.org/depts/los/reference_files/chronological_lists_of_ratifications.htm#The%20United%20Nations%20Convention%20on%20the%20Law%20of%20the%20Sea. Accessed on 18 October 2024.

¹⁵⁹ Punka, A.K. (2023). *Ob. cit.*, p. 42.

¹⁶⁰ UNCLOS, Article 207 (4).

fourteen – out of the eighteen – Regional Seas Programmes adopting a binding framework through an overarching convention to protect the shared marine environment¹⁶¹. Among these, just a few have established protocols for land-based pollution. As a result, other regions lack a binding agreement specifically targeting land-based sources of marine plastic debris. The time required to amend these frameworks, combined with varying regional approaches, is unlikely to result in the global standards needed within the required timeframes¹⁶². This raises concerns about a similar lack of progress in a new implementation agreement under UNCLOS¹⁶³.

A completely new agreement, thus, would offer a fresh opportunity for cooperation between States, as much as it is possible in the global community.

Of greater significance is the fact that UNCLOS does not address plastic pollution in environments other than the marine ecosystem. While much of plastic debris eventually enter the ocean and consequently fall within the scope of the Convention, some remain in rivers, lakes, and soil, potentially threatening both human health and the environment¹⁶⁴.

Pollution that does not affect the ocean would be excluded from the scope of UNCLOS, as well as from any potential implementing agreement under it. The need to regulate plastic pollution across all ecosystems suggests that an agreement under UNCLOS could not be suitable for the comprehensive governance model required¹⁶⁵.

There have also been suggestions to incorporate plastic pollution management into the new international Treaty on the conservation and sustainable use of BBNJ¹⁶⁶ – since as of the time of the first negotiations on the BBNJ agreement, back in 2018, the issue of plastics was already recognised as one of the most urgent environmental issues

¹⁶¹ Mead, L. (2021). **The “Crown Jewels” of Environmental Diplomacy**: Assessing the UNEP Regional Seas Programme. International Institute for Sustainable Development – Earth Negotiations Bulletin, Brief #17, p. 5. Available at: <https://www.iisd.org/system/files/2021-04/still-one-earth-regional-seas.pdf>. Accessed on 13 April 2024.

¹⁶² Raubenheimer, K.; McIlgorm, A. (2017). Is the Montreal Protocol a model that can help solve the global marine plastic debris problem? **Marine Policy**, vol. 81, p. 323. Available at: <https://www.sciencedirect.com/science/article/pii/S0308597X16307096>. Accessed on 12 June 2023.

¹⁶³ Punka, A.K. (2023). *Ob. cit.*, p. 42.

¹⁶⁴ Ghosh, S.; *et al.* (2023). Microplastics as an Emerging Threat to the Global Environment and Human Health. **Sustainability**, vol. 15, n. 14. DOI: <https://doi.org/10.3390/su151410821> Available at: <https://www.mdpi.com/2071-1050/15/14/10821>. Accessed on 12 May 2024.

¹⁶⁵ Punka, A.K. (2023). *Ob. cit.*, p. 42.

¹⁶⁶ Tiller, R.; Nyman, E. (2018). Ocean plastics and the BBNJ treaty - is plastic frightening enough to insert itself into the BBNJ treaty, or do we need to wait for a treaty of its own? **Journal of Environmental Studies and Sciences**, vol. 8, p. 411–415. Available at: <https://link.springer.com/article/10.1007/s13412-018-0495-4>. Accessed on 10 May 2023.

of the present days¹⁶⁷ and, even so, it was not included on the treaty's agenda¹⁶⁸. Such a suggestion is certainly logical, given the large volumes of plastic pollution entering the Areas Beyond National Jurisdiction (ABNJ) and accumulating there in vast quantities¹⁶⁹.

Hence, it is essential that a new agreement on plastic pollution includes mechanisms not only for managing new plastic flows from areas within States jurisdiction's but also for addressing clean-up efforts in ABNJ. This aligns with the principle expressed in Chapter XI of the Convention, which designates the Area¹⁷⁰ and its resources as "*the common heritage of mankind*"¹⁷¹.

Concluding this analysis of the Convention, it is clear that if the objective is to regulate plastic pollution through a comprehensive and circular approach, it could be beneficial to consolidate the management efforts into a single dedicated agreement – as it has been done since 2022.

¹⁶⁷ In 2017, during the third session of UNEA in Nairobi, from 4 to 6 December, States noted with concern the high and increasing levels of marine plastic litter and the expected increase in negative impacts on marine biodiversity, ecosystems, animal welfare, fisheries, maritime transport, recreation and tourism, local societies and economies, highlighting the urgent need for enhanced knowledge of the levels and effects of microplastics and nano plastics on marine ecosystems, seafood and human health. In: UNEP (2018b). **3/7. Marine litter and microplastics** (UNEP/EA.3/Res.7. 3/7). United Nations Environment Assembly of the United Nations Environment Programme. Available at: <https://undocs.org/UNEP/EA.3/Res.7>. Accessed on 10 May 2023.

¹⁶⁸ It should be noted, however, that the BBNJ Treaty addresses pollution indirectly. In its preamble, it acknowledges the "*need to address, in a coherent and cooperative manner, biological diversity loss and degradation of ecosystems of the ocean, due, in particular, to climate change impacts on marine ecosystems, such as warming and ocean deoxygenation, as well as ocean acidification, pollution, including plastic pollution, and unsustainable use*". Beyond this recognition, the agreement adopts a holistic approach to ocean governance and establishes an Environmental Impact Assessment process (Part IV, Articles 27-39) for activities in areas beyond national jurisdiction (ABNJ). Pollution-related aspects include mandatory environmental impact assessments for proposed activities, obligations for cooperation and information-sharing to prevent harm, and the integration of overarching principles such as the "polluter pays" and the "precautionary" principles. While the treaty does not contain a dedicated chapter on pollution, its framework seems to enable the evaluation and regulation of pollution risks from high seas activities with the aim of safeguarding marine biodiversity. In: Wang, Y.; Pan, X. (2025). Application of the environmental impact assessment provisions under the BBNJ Agreement in high seas marine protected area: challenges and suggestion. **Frontiers in Marine Science**, vol. 12. DOI: <https://doi.org/10.3389/fmars.2025.1589936>. Available at: <https://www.frontiersin.org/journals/marine-science/articles/10.3389/fmars.2025.1589936/full>. Accessed on 16 August 2025; UN (2023a). *Ob. cit.*, p. 25-37.

¹⁶⁹ Plastic waste in the ocean, including in ABNJ, exists in different concentrations. Certain regions have seen a higher accumulation of plastic waste, leading to the formation of the so-called "garbage patches" – the most known being the Great Pacific Garbage Patch. These patches contain plastic debris of all sizes, from microscopic particles to larger pieces (some of which may have been produced in the 1970's), and the accumulation of waste is occurring at an accelerating rate. In: Lebreton, L.; *et. al.* (2018). *Ob. cit.*, p. 13.

¹⁷⁰ UNCLOS, Article 1 (1) defines it as "the seabed and ocean floor and subsoil thereof, beyond the limits of national jurisdiction".

¹⁷¹ UNCLOS, Article 136.

- *Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal (Basel Convention)*

The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal, or simply the Basel Convention, was adopted on 22 March 1989 – and entered into force in 1992, been ratified by 191 countries –, following the discovery in the 1980's that the African continent and other developing regions were importing toxic waste from other countries¹⁷².

Its main objective is to protect human health and the environment from the harmful effects of hazardous waste. The Basel Convention, thus, seeks to minimise the transboundary movement of hazardous wastes by mandating that the importing country provide Prior Informed Consent (PIC) before any waste can be exported – it also bans all trade of hazardous waste (and other types of waste) with countries that are not parties to the Convention¹⁷³. About the PIC, the Convention provides that

1. The State of export shall notify, or shall require the generator or exporter to notify, in writing, through the channel of the competent authority of the State of export, the competent authority of the States concerned of any proposed transboundary movement of hazardous wastes or other wastes. (...) 2. The State of import shall respond to the notifier in writing, consenting to the movement with or without conditions, denying permission for the movement, or requesting additional information. (...) 4. The State of export shall not allow the transboundary movement to commence until it has received the written consent of the State of transit (...) ¹⁷⁴.

Aware of the risks caused by hazardous and other wastes and their transboundary movement ¹⁷⁵, the Basel Convention can be understood as an important binding mechanism allied to mitigating the effects of transboundary pollution, which can also result from the discharge of plastic litter into the ocean.

Until recently, however, plastics were not explicitly defined in any of the categories brought by the Convention. Plastics were not classified as “hazardous waste” (Annex I/III) or “other waste” (Annex II) under the Convention. While plastics could have been categorised as “Y46 Wastes collected from households”¹⁷⁶, this would only

¹⁷² SBC (2011). The Convention Overview. United Nations Environment Programme. Available at: <https://www.basel.int/TheConvention/Overview/tabid/1271/Default.aspx>. Accessed on 09 December 2024.

¹⁷³ Basel Convention, Article 4. General Obligations (...) “5. A Party shall not permit hazardous wastes or other wastes to be exported to a non-Party or to be imported from a non-Party”.

¹⁷⁴ Basel Convention, Article 6.

¹⁷⁵ SBC (2023). **Basel Convention on the control of Transboundary Movements of Hazardous Wastes and their Disposal**. Texts and Annexes revised in 2023. Available at: <https://www.basel.int/Portals/4/download.aspx?d=UNEP-CHW-IMPL-CONVTEXT-2023.English.pdf>. Accessed on 17 July 2024.

¹⁷⁶ Basel Convention, Annex II “Categories of wastes requiring special consideration”.

apply to plastic waste that was specifically collected – plastic waste discarded directly into streets or rivers would not have been included.

Alternatively, a State Party could have defined types of waste that do not belong to any category contained in Annex I “Categories of wastes to be controlled” as “hazardous waste” in its national legislation. In that scenario, those wastes would also be regarded as “hazardous waste” under the Convention – just because they were defined as such by the domestic legislation of the Party of export, import or transit¹⁷⁷. Since that was not the case, “solid plastic waste” was classified as non-hazardous waste in Annex IX, placing it outside the scope of the Basel Convention.

The increasing levels of plastics has been recognised as a serious global environmental problem, so much that in 2019, the Conference of the Parties to the Basel Convention adopted important decisions to address plastic waste – measures that strengthened the Basel Convention as the only global legally binding instrument to date to specifically address plastic waste¹⁷⁸.

In the Report of the fourteenth meeting of the COP to the Convention (COP-14), many representatives – including several speaking on behalf of groups of countries – took the floor to highlight the extent of the plastic waste problem and the importance of taking action to manage it¹⁷⁹.

¹⁷⁷ Basel Convention, Article 1 “The following wastes that are subject to transboundary movement shall be “hazardous wastes” for the purposes of this Convention. 1. a) Wastes that belong to any category contained in Annex I, unless they do not possess any of the characteristics contained in Annex III; and b) Wastes that are not covered under paragraph (a) but are defined as, or are considered to be, hazardous wastes by the domestic legislation of the Party of export, import or transit.”

¹⁷⁸ SBC (2021). Plastic Waste – Overview. Actions for addressing plastic waste under the Basel Convention, Secretariat of the Basel Convention. Available at: <http://www.basel.int/Implementation/Plasticwaste/Overview/tabid/8347/Default.aspx>. Accessed on 17 November 2024.

¹⁷⁹ SBC (2019). Fourteenth Meeting of the Conference of the Parties to the Basel Convention Geneva, Switzerland, from 29 April to 10 May 2019 – UNEP/CHW.14/28. Available at: <http://www.basel.int/TheConvention/ConferenceoftheParties/Meetings/COP14/tabid/7520/Default.aspx>. Accessed on 17 November 2024.

During COP-14 amendments to Annexes II, VIII and IX were adopted in decision BC-14/12¹⁸⁰, with the aim of increasing control over transboundary movements of plastic litter and clarifying the scope of the Convention with regards to such waste¹⁸¹.

The amendments concern changes to the scope of plastic waste covered by the Basel Convention, as decided in May 2019, and have a significant impact on the rules governing the movement of plastics across international borders. The three amendments specify the new categories of plastic waste that are subject to the Basel Convention. The amendments, however, do not imply a ban on the import, transit or export of plastic waste¹⁸², but rather consist of a clarification of when and how the Convention applies to such waste¹⁸³.

Once the amendments – binding for all 191 Parties to the Convention¹⁸⁴ – entered in force in January 2021, it was up to each Party to take the necessary measures to transpose it into national legislation, depending on its legal system. These measures should be taken in a timely manner, and the provisions of the Convention regarding the minimization of waste generation and the guarantee of its environmentally sound management should be applied¹⁸⁵.

The social, economic, and environmental importance of decision BC-14/12 should not be overlooked. It is worth mentioning that during the adoption process, several industry groups voiced their opposition, arguing that the new administrative requirements

¹⁸⁰ Through decision BC-14/12, the COP approved amendments to three annexes to the Convention: Annex II (waste categories requiring special consideration – subject to the Prior Informed Consent Procedure): addition of the new entry Y48 covering all plastic wastes, including mixtures of plastic wastes, except for plastic wastes covered by entries A3210 (in Annex VIII) and B3011 (in Annex IX); Annex VIII (presumably hazardous wastes – subject to the Prior Informed Consent Procedure): addition of the new entry A3210 covering hazardous plastic wastes; Annex IX (waste presumed to be non-hazardous – not subject to the Prior Informed Consent Procedure): addition of new entry B3011, replacing the current entry B3010 after a specific date, covering plastic waste consisting exclusively of a non-halogenated polymer or resin, selected fluorinated polymers or mixtures of polyethylene, polypropylene and/or polyethylene terephthalate, provided that the waste is destined for recycling in an environmentally sound manner and is virtually free from contamination and other types of residues.

¹⁸¹ SBC (2023). *Ob. cit.*, n.p.

¹⁸² More regarding the international transport of plastic waste is discussed in more detail in Part I, Chapter II, Section I, Subsection B.

¹⁸³ SBC (2023). *Ob. cit.*, n.p.

¹⁸⁴ UN Treaty Collection (2024b). 3. Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal. Basel, 22 March 1989. Available at: https://treaties.un.org/pages/viewdetails.aspx?src=treaty&mtdsg_no=xxvii-3&chapter=27&clang=_en. Accessed on 18 November 2024.

¹⁸⁵ SBC (2021). Questions and answers related to the Basel Convention Plastic Waste Amendments. Basel Convention – Implementation – Plastic waste – Amendments. Available at: <http://www.basel.int/Implementation/Plasticwaste/PlasticWasteAmendments/FAQs/tabid/8427/Default.aspx>. Accessed on 18 November 2024.

for mixed plastic waste transactions would discourage investment in global waste management and recycling technologies¹⁸⁶.

The amendments do not impose a ban on plastic waste; instead, they clarify how various types of plastic waste should be handled under the Convention, determining whether they are subject to the PIC procedure or not¹⁸⁷. Certain plastics were added to Annex VIII, classifying them as “hazardous waste” and making them subject to the PIC procedure¹⁸⁸.

Some types of plastic waste were included in Annex IX, where they are presumed to be non-hazardous and thus not subject to the PIC procedure¹⁸⁹. Plastic waste, including mixtures of such waste – consisting of polyethylene (PE), polypropylene (PP) and/or polyethylene terephthalate (PET) –, that are not covered by either the Annexes VIII or IX, were placed in Annex II under the category of “other waste”, making them subject to the PIC procedure¹⁹⁰.

These amendments enhance the Basel Convention’s scope regarding plastic waste, making it easier to regulate the movement of such waste. Subsequent COPs to the Convention have also determined a series of actions to prevent and minimise the generation of plastic waste and control its transboundary movement; to reduce the risk posed by toxic components in plastics; and to stimulate information exchange and increase public awareness of the problem of plastic pollution¹⁹¹.

¹⁸⁶ Khan, S.A. (2020). Clearly Hazardous, Obscurely Regulated: Lessons from the Basel Convention on Waste Trade. *American Journal of International Law Unbound*, vol. 114, p. 202. DOI: 10.1017/aju.2020.38. Available at: <https://www.cambridge.org/core/journals/american-journal-of-international-law/article/clearly-hazardous-obscurely-regulated-lessons-from-the-basel-convention-on-waste-trade/E250702AE51D72AC342AA811D3003579>. Accessed on 12 August 2023.

¹⁸⁷ At COP-14 the Parties to the Basel Convention established the Plastic Waste Partnership. This voluntary initiative is open to all member states and aims to “mobilize business, government, academic and civil society resources, interests and expertise to improve and promote the ESM of plastic waste at the global, regional and national levels and to prevent and minimize its generation”. The Partnership has selected at least 23 pilot projects to be implemented by governments, the private sector, civil society, and the Basel and Stockholm Convention Regional Centres. In: SBC (2021). “Overview”. Basel Convention – Implementation – Plastic waste – Plastic Waste –Partnership. Available at: <https://www.basel.int/Implementation/Plasticwaste/PlasticWastePartnership/tabid/8096/Default.aspx>. Accessed on 18 November 2024.

¹⁸⁸ Basel Convention, Annex VIII, new entry A3210 “Plastic waste, including mixtures of such waste, containing or contaminated with Annex I constituents, to an extent that it exhibits an Annex III characteristic (note the related entries Y48 in Annex II and on list B B3011).”

¹⁸⁹ Plastic waste not subject to the PIC procedure includes those primarily composed of polymers such as PET, PE, and PP, as well as waste made almost entirely of a single cured resin or condensation product, like urea formaldehyde resins and epoxy resins. Additionally, an array of other wastes composed mostly of specific polymers is also excluded from the PIC procedure. (Basel Convention, Annex IX, new entry 3011).

¹⁹⁰ Basel Convention, Annex II, new entry Y48.

¹⁹¹ For instance, at its sixteenth meeting, the COP to the Basel Convention adopted the technical guidelines on the ESM of plastic wastes (Decision BC-16/4). In: UNEP (2024b). Information on the work carried out within the framework of the Basel, Rotterdam and Stockholm conventions as it relates to the sixth session of the United Nations Environment Assembly. Available at: <https://documents.un.org/doc/undoc/gen/k24/003/41/pdf/k2400341.pdf>. Accessed on 14 November 2024.

The Basel Convention, however, heavily depends on the Parties to establish their own measures for implementing and complying with the Treaty. While the PIC procedure serves as an effective mechanism for monitoring transboundary movements, it may not work as intended in practice due to a lack of technical, administrative, and financial resources to safely dispose or recycle this waste – especially in developing State Parties¹⁹².

Also, there are no mechanisms in place to enforce liability if a Party fails to follow the required PIC procedure, potentially leading to illegal or environmentally harmful waste transfers. The Basel regime lacks effective monitoring and enforcement mechanisms, which could impact States' compliance – in fact, although the new plastic amendments legally bind all Basel parties, there are no strict penalties for non-compliance¹⁹³.

The Convention does not mandate that State Parties adopt consistent domestic definitions for key terms under the instrument. As a result, there may be confusion and uncertainty regarding the classification of plastics as “hazardous waste” versus “non-hazardous waste”. The amendments specify that this distinction will depend on whether the plastic waste is “almost free from contamination and other types of wastes” and consists of “almost exclusively” one polymer or resin¹⁹⁴.

Insights from the rules around electronic waste (eWaste) within the Basel Convention demonstrate that linguistic ambiguities can create significant challenges regarding the legal clarity of definitions. Addressing these ambiguities and achieving clear legal distinctions between hazardous waste and non-hazardous “goods”, for example, is almost insurmountable, given the fragmented global regulatory framework and the voluntary nature of the technical guidance instruments developed under the agreement¹⁹⁵.

This is a crucial point to consider for the future Global Plastics Treaty. Linguistic ambiguities can introduce uncertainties and potentially hinder the achievement of shared

¹⁹² Krueger, J. (1998). Prior Informed Consent and the Basel Convention: The Hazards of What Isn't Known. **The Journal of Environment & Development**, vol. 7, n. 2, p. 130-131. DOI: <https://doi.org/10.1177/107049659800700203>. Available at : <https://journals.sagepub.com/doi/10.1177/107049659800700203?icid=int.sj-abstract.citing-articles.10>. Accessed on 11 August 2022.

¹⁹³ Khan, S.A. (2020). *Ob. cit.*, p. 204.

¹⁹⁴ BC-14/12: Amendments to Annexes II, VIII and IX to the Basel Convention, *supra* note 180.

¹⁹⁵ Khan, S.A. (2016). E-products, E-waste and the Basel Convention: Regulatory Challenges and Impossibilities of International Environmental Law. **RECIEL - Review of European, Comparative & International Environmental Law**, vol. 25, n. 2, Special Issue: The Paris Agreement, p. 251-252. DOI: <https://doi.org/10.1111/reel.12163>. Available at: <https://onlinelibrary.wiley.com/doi/epdf/10.1111/reel.12163>. Accessed on 17 August 2022.

objectives. Similarly, the definitions of plastic waste and the management and regulation of various polymers and types of plastic waste should be incorporated into the treaty, possibly within a technical annex. This would help establish and sustain a consistent global approach.

While the Basel Convention is the most comprehensive international framework for waste management, it addresses only a small portion of the plastic pollution phenomenon, focusing on a limited segment of the plastic lifecycle – important gaps in managing all stages of the lifecycle for most plastics that are not classified as hazardous remain¹⁹⁶.

The Basel Convention includes provisions aimed at minimising hazardous and other wastes. However, the Convention primarily focuses on the waste management phase, with limited attention given to prevention in its binding legal provisions. This gap calls for strengthening global efforts to address waste generation throughout all stages of the life cycle¹⁹⁷.

The Basel Convention and its non-binding technical guidelines do not provide indicators of success or set timelines for reducing plastic waste generation –in fact, developing targets and indicators for transitioning to alternative materials or plastics that can be safely and effectively reused, remanufactured, and recycled could help reduce plastic waste. By decreasing plastic waste generation, however, the Convention indirectly helps reduce creating more microplastics that come from the degradation of larger plastics¹⁹⁸. The Convention is strong in its scope but remains fundamentally inadequate for tackling the broader issue in focus.

¹⁹⁶ Raubenheimer, K.; McIlgorm, A. (2018). Can the Basel and Stockholm Conventions provide a global framework to reduce the impact of marine plastic litter? **Marine Policy**, vol. 96. DOI: <https://doi.org/10.1016/j.marpol.2018.01.013>. Available at: <https://www.sciencedirect.com/science/article/abs/pii/S0308597X17305146#:~:text=The%20Stockholm%20Convention%20and%20the%20Basel%20Convention%20can%20play%20a,and%20quantity%20of%20waste%20mismanaged>. Accessed on 03 September 2022.

¹⁹⁷ BRS (2023). **Global governance of plastics and associated chemicals**. Secretariat of the Basel, Rotterdam and Stockholm Conventions, United Nations Environment Programme, Geneva. Karen Raubenheimer, Niko Urho, p. 63. Available at: <https://www.basel.int/Portals/4/Basel%20Convention/docs/plastic%20waste/UNEP-FAO-CHW-RC-POPS-PUB-GlobalGovernancePlastics-2023.pdf>. Accessed on 02 August 2024.

¹⁹⁸ UNEP (2017a). *Ob. cit.*, p. 57.

- *Stockholm Convention on Persistent Organic Pollutants (Stockholm Convention)*

The Stockholm Convention on POPs was adopted in 2001 and entered into force on 17 May 2004, counting with a 186 Parties to this day¹⁹⁹. The Convention prohibits or restricts the production and use of the substances categorised as “POPs”, which are a type of particularly hazardous chemicals. The main objective of the instrument is, therefore, to protect human health and the environment from damage caused by these pollutants²⁰⁰.

The POPs are chemicals that persist in nature for extended periods and can be transported over long distances through the entire globe – by air and seas, and consequently exist in detectable and growing concentrations, even far from their original source²⁰¹. They also accumulate in the adipose tissues of humans and wildlife, posing harmful effects on both human health and the environment²⁰².

Most POPs have been identified after World War II, when scientists noticed specific chemical contaminants that are toxic, persistent in the environment, bio accumulative, prone to long-range atmospheric transport and deposition, and likely to cause serious health effects in humans, wildlife, and marine life both near and far from their emission sources²⁰³. The unusual persistence and semi-volatility of these compounds, along with other characteristics, have led to the global presence of substances like polychlorinated biphenyls (PCBs)²⁰⁴, even in areas where they have never been used. POPs are ubiquitous²⁰⁵.

Since scientific evidence about the dangers from POPs increased, in May 1995,

¹⁹⁹ Secretariat of the Stockholm Convention (2024). Status of ratification. Stockholm Convention – Countries – Status of Ratifications – Parties and Signatories. Available at: <https://chm.pops.int/Countries/StatusofRatifications/PartiesandSignatories/tabid/4500/Default.aspx>. Accessed on 02 August 2024.

²⁰⁰ Stockholm Convention, Article 1. In: UNEP (2011b). *Ob. cit.*, p. 2.

²⁰¹ UNEP (1995a). Decision 18/32 of the UNEP Governing Council: Persistent Organic Pollutants. 9th meeting, 25 May 1995. Available at: https://chm.pops.int/portals/0/docs/from_old_website/documents/background/gcdecision/18_32/gc1832en.html. Accessed on 17 July 2024.

²⁰² Barrett, J.R. (2013). POPs vs. Fat: Persistent Organic Pollutant Toxicity Targets and Is Modulated by Adipose Tissue. **Environmental Health Perspectives**, vol. 121, n. 2. DOI: 10.1289/ehp.121-a61. Available at: <https://pmc.ncbi.nlm.nih.gov/articles/PMC3569705/>. Accessed on 17 July 2024.

²⁰³ Ashraf, M.A. (2017). Persistent organic pollutants (POPs): a global issue, a global challenge. **Environmental Science and Pollution Research**, vol. 24, p. 4223–4227. DOI: <https://doi.org/10.1007/s11356-015-5225-9>. Available at: <https://link.springer.com/article/10.1007/s11356-015-5225-9>. Accessed on 13 June 2023.

²⁰⁴ PCBs were extensively used in electrical equipment such as capacitors and transformers, as well as in hydraulic fluids, heat transfer fluids, lubricants, and plasticisers. In: Borja, J.; *et al.* (2005). Polychlorinated biphenyls and their biodegradation. **Process Biochemistry**, vol. 40, n. 6, p. 2000. Available at: <https://www.sciencedirect.com/science/article/pii/S0032959204003620>. Accessed on 14 May 2022.

²⁰⁵ Ritter, L.; Solomon, K.R.; Forget, J. (2001). **Persistent Organic Pollutants - An Assessment Report on: DDT-Aldrin-Dieldrin-Endrin-Chlordane Heptachlor-Hexachlorobenzene Mirex-Toxaphene Polychlorinated Biphenyls Dioxins and Furans**, p. 7. Available at: https://chm.pops.int/Portals/0/docs/from_old_website/documents/background/assessmentreport/en/ritter.pdf. Accessed on 14 May 2022.

the UNEP Governing Council, through Decision 18/32, called for an international assessment of an initial list of 12 POPs²⁰⁶. It also tasked the Intergovernmental Forum on Chemical Safety (IFCS) with developing recommendations and information on international action – as it would be needed for a possible decision regarding a dedicated international legal mechanism on POPs – to be presented to the Governing Council and the World Health Assembly by 1997²⁰⁷.

In June 1996, the IFCS concluded its work on advice for international action, recommending that a new global LBI would be necessary to reduce the risks posed by the POPs – starting from the initial 12 chemicals that were cited in Decision 18/32, as there was still a need to establish science-based criteria and a process for identifying additional POPs²⁰⁸.

As a result, in February 1997, the UNEP Governing Council, through decision 19/13C, established an INC with the mandate to prepare an international LBI to address such pollutants²⁰⁹. The INC held five meetings between June 1998 and December 2000²¹⁰, which later led to the adoption of the Stockholm Convention.

It is important to note that the significance of the Stockholm Convention in addressing plastic pollution stems from the fact that several of the chemicals listed in the instrument's annexes²¹¹ are relevant to plastics, as many of them are added (Fig.1) to

²⁰⁶ These POPs were: PCBs, dioxins and furans, aldrin, dieldrin, DDT, endrin, chlordane, hexachlorobenzene, mirex, toxaphene, and heptachlor. In: UNEP (1995a). *Ob. cit.*, n.p.

²⁰⁷ Chasek, P. (2023). Stockholm Convention on Persistent Organic Pollutants. Earth Negotiations Bulletin (a division of the International Institute for Sustainable Development - IISD). Available at: <https://enb.iisd.org/articles/Stockholm-convention#:~:text=The%2012%20POPs%2C%20sometimes%20called,produced%20POPs%3A%20dioxins%20and%20furans>. Accessed on 11 May 2023.

²⁰⁸ UNEP (1998). Final report of the meeting of the Intergovernmental Forum on Chemical Safety Ad Hoc Working Group on Persistent Organic Pollutants, held on 21 and 22 June 1996 in Manila – Note by the Secretariat (UNEP/POPS/INC.1/INF/4). Montreal, 29 June-3 July 1998. Available at: https://chm.pops.int/Portals/0/docs/from_old_website/documents/meetings/inc1/inf4.htm. Accessed on 12 April 2024.

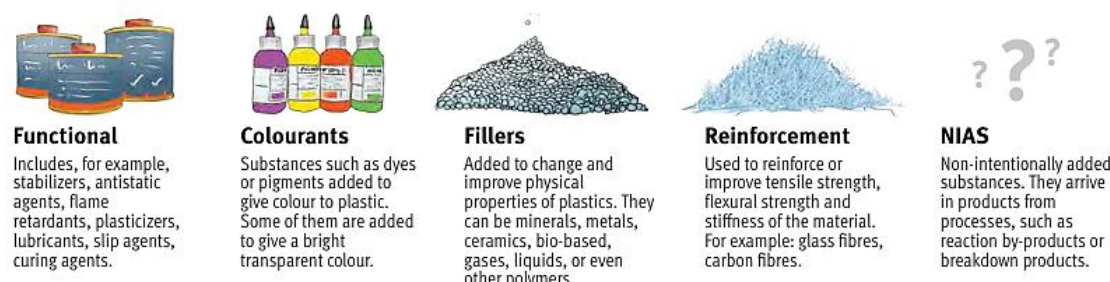
²⁰⁹ UNEP (1997). Decisions adopted by the Governing Council at its nineteenth session. 13C. International action to protect human health and the environment through measures which will reduce and/or eliminate emissions and discharges of persistent organic pollutants, including the development of an international legally binding instrument. Available at: https://chm.pops.int/portals/0/docs/from_old_website/documents/background/gcdecision/19_13c/gcpops_e.html. Accessed on 15 February 2023.

²¹⁰ Secretariat of the Stockholm Convention (2004). History of the negotiations of the Stockholm Convention. Stockholm Convention – The Convention – Overview – History – Overview. Available at: <https://chm.pops.int/TheConvention/Overview/History/Overview/tabid/3549/Default.aspx>. Accessed on 13 February 2023.

²¹¹ Stockholm Convention, Annex A “Elimination” outlines chemicals that must be eliminated; Annex B “Restriction” identifies chemicals that should be restricted; and Annex C “Unintentional Production” emphasises the need to minimise the unintentional production and release of the listed chemicals. In: UNEP (2023a). Stockholm Convention on Persistent Organic Pollutants (POPs) Text and Annexes revised in 2023. Available at: <https://www.pops.int/Portals/0/download.aspx?d=UNEP-POPS-COP-CONVTEXT-2023.English.pdf>. Accessed on 17 November 2024.

plastic products to enhance specific properties:

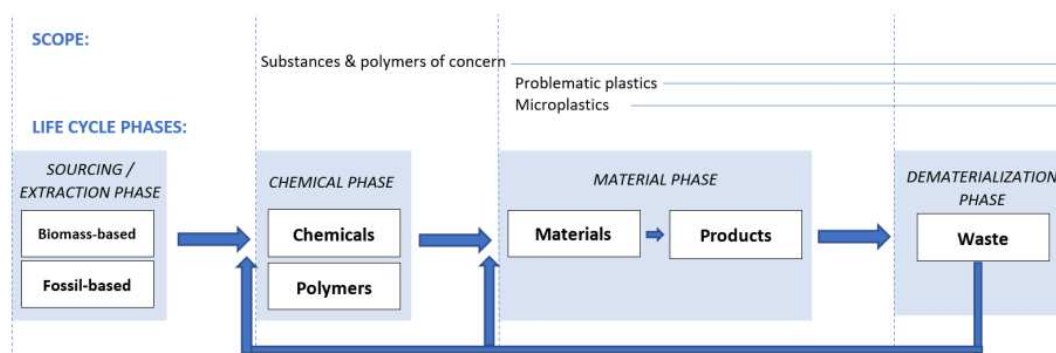
Figure 1 – Types of plastic additives²¹²



Source: UNEP (2021a). Drowning in Plastics – Marine Litter and Plastic Waste Vital Graphics.

Moreover, as Figure 2 presents below, there are at least four phases in the life cycle of plastics. The sourcing/extraction phase regards the extraction of raw materials, both organic (hydrocarbons, including from bio-based sources) and inorganic, to produce plastics and associated chemicals. The chemical phase concerns the production of building blocks and chemical processing to produce polymers and both commodity and specialty chemicals. Following this, the material phase includes the manufacturing of materials, the production of intermediate and final products, and their consumption. And, finally, the dematerialisation phase consists of waste management, including the collection, sorting, recovery, and final disposal, as well as remediation efforts:

Figure 2 – Possible scope of plastic pollution²¹³



Source: BRS (2023). Global governance of plastics and associated chemicals.

In this context, for instance, Polybrominated diphenyl ethers (PBDEs), which are

²¹² UNEP (2021a). **Drowning in Plastics** – Marine Litter and Plastic Waste Vital Graphics. ISBN: 978-92-807-3888-9, p. 14. Available at: <https://www.unep.org/resources/report/drowning-plastics-marine-litter-and-plastic-waste-vital-graphics>. Accessed on 12 September 2023.

²¹³ BRS (2023). *Ob. cit.*, p. 10.

listed in the Annex A “Elimination”, are added to plastics to make it flame retardant²¹⁴. Other chemicals, such as polychlorinated biphenyls, which have been extensively used since 1930 in several industrial uses²¹⁵, are commonly found in marine plastic litter at high concentrations due to the adhesive nature of plastics – and are also included in Annexes A and C²¹⁶. Measures to reduce exposure and control the use of PCBs include, for example, not using them in the equipment employed in areas associated with the production or processing of food or feed²¹⁷.

Only a small portion of the chemicals involved in the plastic life cycle, however, are regulated by current MEAs. The chemical phase addresses roughly 4% (128) of the 3.200 chemicals of concern in plastics, including additives, processing aids, monomers, and non-intentionally added substances (NIAS). Moreover, hazard data is missing for approximately 6.000 chemicals used in plastics – many of which could be potentially harmful²¹⁸.

The hazard and risk assessment of chemicals is promoted as a voluntary measure under the Strategic Approach to International Chemicals Management, which has encouraged numerous countries to develop regulatory frameworks for chemical safety assessments. Nevertheless, the large number of chemicals for which hazard data is missing highlights the weak regulatory capacity and enforcement in many countries²¹⁹.

It is thus evident that there are plastics made up of POPs and, more than that, that these materials, after being produced and marketed, still retain the characteristics of these substances, since their presence in the environment lasts for decades and centuries, until they reach their fragmentation into micro or nano plastics.

The Convention, consequently, supports the proper management of plastic waste

²¹⁴ There are three types of commercial PBDE mixtures (c-pentaBDE, c-octa BDE, and c-decaBDE), and the Stockholm Convention specifies that tetra- to heptaBDEs (present in c-pentaBDE and c-octaBDE), and decaBDE (BDE-209; present in c-decaBDE), are to be eliminated. Plastic waste from electrical and electronic equipment may contain PBDEs, so this waste should be carefully separated and disposed of in an environmentally responsible manner. In: Kukharchyk, T.; Příbylová, P.; Chernyuk, V. (2020). Polybrominated diphenyl ethers in plastic waste of electrical and electronic equipment: a case study in Belarus. **Environmental Science and Pollution Research**, vol. 27, n. 25. DOI: 10.1007/s11356-020-09670-8. Available at: <https://pubmed.ncbi.nlm.nih.gov/32557023/>. Accessed on 18 April 2023; and Kajiwar, N.; *et al.* (2022). Recycling plastics containing decabromodiphenyl ether into new consumer products including children’s toys purchased in Japan and seventeen other countries. **Chemosphere**, vol. 289. Available at: <https://www.sciencedirect.com/science/article/pii/S0045653521036511>. Accessed on 18 April 2023.

²¹⁵ Ritter, L.; Solomon, K.R.; Forget, J. (2001). *Ob. cit.*, p. 38.

²¹⁶ UNEP (2023a). *Ob. cit.*, n.p.

²¹⁷ Stockholm Convention, Annex A “Elimination”, Part II “Polychlorinated biphenyls” (b) (ii).

²¹⁸ UNEP; BRS (2023). **Chemicals in plastics**: a technical report. Geneva, ISBN: 978-92-807-4026-4, p. 47. Available at: <https://wedocs.unep.org/bitstream/handle/20.500.11822/42366/Chemicals-in-Plastics.pdf?sequence=1&isAllowed=y>. Accessed on 05 April 2024.

²¹⁹ BRS (2023). *Ob. cit.*, p. 11.

containing these chemicals, minimising the risk of potential human and environmental exposure to the regulated substances.

Its scope regarding plastics and plastic waste, however, is limited to the substances that are designated as POPs. Besides, although the Stockholm Convention offers an important opportunity to continue adding POPs used in plastics to its list, the majority of chemicals of concern fall beyond its reach. The POPs Review Committee serves as a scientific body that reviews proposals for listing new chemicals as POPs under the Convention before making recommendations to the COP. The chemical review process takes at least three meetings/years to complete, as it involves three stages: screening, risk profiling, and risk management evaluation²²⁰.

- *Rotterdam Convention on the Prior Informed Consent Procedure for the International Trade in Certain Hazardous Chemicals and Pesticides (Rotterdam Convention)*

The 1998 Rotterdam Convention on the Prior Informed Consent Procedure for the International Trade in Certain Hazardous Chemicals and Pesticides aimed to promote shared responsibility and cooperative efforts among States Parties in the international trade of certain chemicals in order to protect the health of natural ecosystems and human health, being ratified by 166 countries²²¹.

This Convention is binding and acknowledges that there has been a dramatic growth in the production and trade of chemicals²²² – which has increased public and official concern about the potential risks posed by hazardous chemicals and pesticides. It also recognises that countries without (or with little) adequate infrastructure to monitor the import and use of these chemicals are particularly vulnerable²²³. Thus, the Rotterdam Convention aims to promote shared responsibility and cooperative efforts among Parties to regulate international trade in certain hazardous chemicals in order to protect human

²²⁰ *Ibid*, p. 47.

²²¹ Secretariat of the Rotterdam Convention (2024). Status of ratifications. Rotterdam Convention – Countries – Status of ratification – Parties and Signatories. Available at: <https://www.pic.int/Countries/Statusofratification/PartiesandSignatories/tabid/1072/language/en-US/Default.aspx>. Accessed on 12 November 2024.

²²² The Rotterdam Convention establishes a prior informed consent (PIC) mechanism for the international trade of hazardous chemicals. Chemicals subject to this procedure are listed in Annex III of the Convention, including some that are also regulated by the Basel and Stockholm Conventions and are linked to the production of plastic products or marine plastic litter (e.g., PCB and DDT).

²²³ FAO; UNEP (2023). **Rotterdam Convention on the prior informed consent procedure for certain hazardous chemicals and pesticides in International Trade**. Text and annexes. Revised in 2023. Available at: <https://www.pic.int/Portals/5/download.aspx?d=UNEP-FAO-RC-CONVTEXT-2023.English.pdf>. Accessed on 12 October 2024.

health and the environment from potential harm, as well as to contribute to their environmentally sound use²²⁴.

Its Annex III lists “Chemicals subject to the prior informed consent procedure”, highlighting the Polybrominated biphenyls (PBB)²²⁵, which are another substance commonly added to plastics used in the production of items such as computer monitors, televisions, textiles, and plastic foams designed to be fire-resistant²²⁶. This is yet one more example of the toxicity present in many plastics, both due to their intrinsic composition and the elements added to them.

Bisphenol-A is other example of a substance present in various plastic packaging, such as PET bottles and baby bottles. It is one of the most widely used chemicals in the planet and there are numerous studies that assess that the vast majority of the world’s population has detectable levels of BPA in their bodies²²⁷. This is harmful, since BPA acts on the human body by disrupting a series of vital physiological processes²²⁸.

Exposure to BPA is likely or highly likely to pose a risk for immunotoxicity, metabolic disturbances, neurotoxicity, developmental toxicity, female and male reproductive toxicity, as well as carcinogenicity. Very recently, in fact, researchers found that microplastics – besides being suspected of negatively affecting human reproductive, digestive, and respiratory health – have a potential connection to colon and lung cancer²²⁹. Other studies indicate that microplastics may contribute to dementia as well²³⁰.

²²⁴ As stated in its Article 1 “Objectives”.

²²⁵ Rotterdam Convention, Annex III “Chemicals subject to the prior informed consent procedure”. In: FAO; UNEP (2023). *Ob. cit.*, p. 33-36.

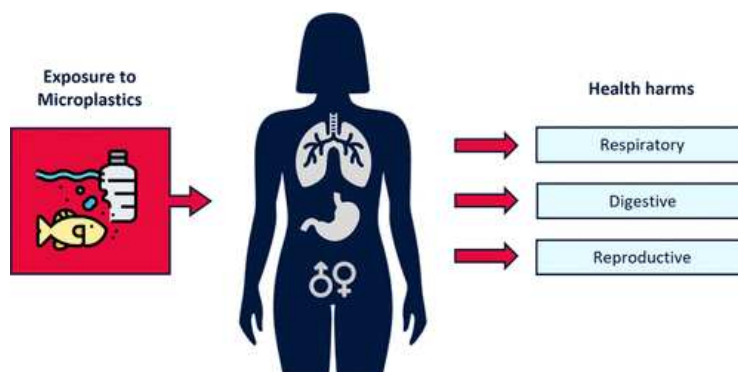
²²⁶ Singh, N.; Duan, H.; Tang, Y. (2020). Toxicity evaluation of E-waste plastics and potential repercussions for human health. **Environment International**, vol. 137, p. 2. DOI: <https://doi.org/10.1016/j.envint.2020.105559>. Available at: <https://www.sciencedirect.com/science/article/pii/S0160412019332556>. Accessed on 17 September 2023.

²²⁷ Daronchi, O.T.; *et. al.* (2020). *Contaminação ambiental em larga escala por Bisfenol-A: estamos conscientes do risco e formas de exposição?* **Ciência & Saúde Coletiva**, vol. 25, n. 11, p. 4340. ISSN 1678-4561. Available at: <https://cienciaesaudecoletiva.com.br/artigos/contaminacao-ambiental-em-larga-escala-por-bisfenola-estamos-conscientes-do-risco-e-formas-de-exposicao/17074?id=17074>. Accessed on 13 December 2021.

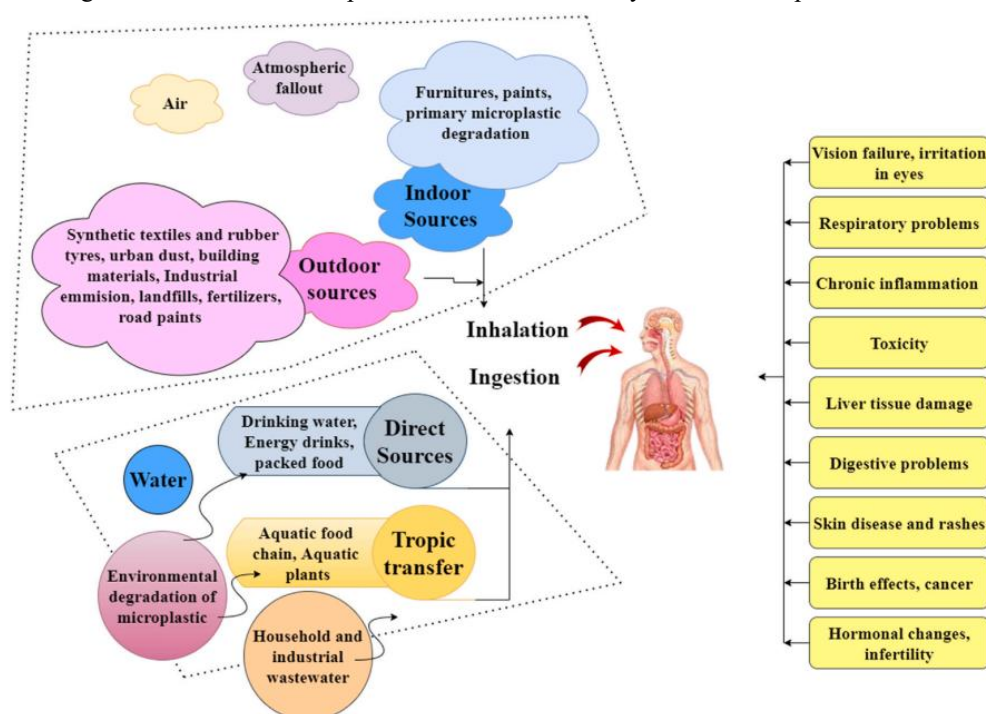
²²⁸ BPA is an endocrine disruptor and may be associated with a variety of diseases, including metabolic diseases such as diabetes mellitus, obesity, brain and behavioural disorders, reproductive disorders and human development disorders, including changes in brain plasticity and behavioural and language disorders, especially in children. In addition, there is a positive relationship between BPA and an increased risk of developing neoplasms, especially hormone-dependent ones such as breast, uterine, ovarian, prostate and testicular neoplasms.

²²⁹ Chartres, N.; *et. al.* (2024). Effects of Microplastic Exposure on Human Digestive, Reproductive, and Respiratory Health: A Rapid Systematic Review. **Environmental Science & Technology**, DOI: <https://doi.org/10.1021/acs.est.3c09524o>. Available at: <https://pubs.acs.org/doi/10.1021/acs.est.3c09524>. Accessed on 27 December 2024.

²³⁰ Wang, G.; Lin, Y.; Shen, H. (2024). Exposure to Polystyrene Microplastics Promotes the Progression of Cognitive Impairment in Alzheimer’s Disease: Association with Induction of Microglial Pyroptosis. **Molecular Neurobiology**, vol. 61, n. 2, p. 900. DOI: 10.1007/s12035-023-03625-z. Available at: <https://pubmed.ncbi.nlm.nih.gov/37670159/>. Accessed on 05 January 2025.

Figure 3 – Representative illustration of the adverse effects of microplastics on human health²³¹

Source: Chartres, N.; *et. al.* (2024). Effects of Microplastic Exposure on Human Digestive, Reproductive, and Respiratory Health: A Rapid Systematic Review.

Figure 4 – Routes of microplastic into the human body and health impacts²³²

Source: Priya, A.K.; *et. al.* (2023). A study on managing plastic waste to tackle the worldwide plastic contamination and environmental remediation. **Chemosphere**, vol. 341, 139979, p. 9.

There is well-established evidence from authoritative and systematic reviews regarding the human health effects of plasticisers and plastics-related chemicals²³³. The

²³¹ Chartres, N.; *et. al.* (2024). *Ob. cit.*, p. A.

²³² Priya, A.K.; *et. al.* (2023). A study on managing plastic waste to tackle the worldwide plastic contamination and environmental remediation. **Chemosphere**, vol. 341, 139979, p. 9. DOI: <https://doi.org/10.1016/j.chemosphere.2023.139979>. Available at: <https://www.sciencedirect.com/science/article/pii/S0045653523022488?via%3Dihub>. Accessed on 19 January 2024.

²³³ Seewoo, B.J.; *et. al.* (2023). The plastic health map: A systematic evidence map of human health studies on plastic-associated chemicals. **Environment International**, vol. 181. DOI: <https://doi.org/10.1016/j.envint.2023.108225>. Available at:

threat of plastic, hence, manifests in various forms (Figures 3 and 4). It ranges from its basic external use to its integration into the food chain, posing a significant risk to human health²³⁴.

As concerns about chemicals and the risks they can pose to humans have increased and, considering the convergences between the three conventions, in 2011, the COPs of the Basel, Rotterdam and Stockholm Conventions (or the “BRS COPs”) agreed to establish processes to enhance coordination and cooperation among them. Since 2013, the COP meetings have been held consecutively, featuring joint sessions on shared issues. These “triple COPs” meetings have highlighted the interconnectedness of the three conventions and topics like plastic pollution and marine litter. They also emphasise the toxicity of plastics and their additives²³⁵.

Since 2017, the BRS COPs have enhanced their joint work program, including collaborative efforts on hazardous substances from plastic products. They also established a “triple COP” where the meetings of their respective COPs are held simultaneously or jointly to address topics that fall within the scope of all three – such as the regulation of hazardous substances in plastic products²³⁶. This has led to successive amendments to the Conventions – like those already analysed, from the Basel Convention –, strengthening the scrutiny and control over plastic waste, hazardous plastics or plastic-associated substances, and their related chemicals (particularly additives and plasticisers).

In the report of the 8th edition of the COP to the Rotterdam Convention, it is possible to read among the key messages emerging from the high-level segment of the conferences of the Parties to the Basel, Rotterdam and Stockholm conventions that

Although there has been much progress, further efforts through the Basel, Rotterdam and Stockholm conventions are needed to achieve the sound management of chemicals throughout their life cycles and to prevent or minimize significant adverse effects of hazardous wastes on human health and the environment. (...) Raising awareness of the interlinkages between the Basel, Rotterdam and Stockholm conventions and issues such as air pollution, plastic pollution and marine litter increases the visibility of chemicals and wastes issues in a consistent manner to stakeholders, the media and schools, thereby enhancing the conventions’ contributions to the achievement of the

<https://www.sciencedirect.com/science/article/pii/S0160412023004981?via%3Dihub>. Accessed on 08 January 2024.

²³⁴ Rochman, C.M.; *et. al.* (2013). *Ob. cit.*, p. 170.

²³⁵ Lyons, Y.; *et. al.* (2020). **Status of Research, Legal and Policy Efforts on Marine Plastics in ASEAN+3: A Gap Analysis at the Interface of Science, Law and Policy.** COBSEA and NUS, p. 70. Available at: <https://wedocs.unep.org/bitstream/handle/20.500.11822/33383/NUS.pdf?sequence=1&isAllowed=y%C3%B9>. Accessed on 12 September 2023.

²³⁶ *Ibid.*, p. 193.

Sustainable Development Goals and the protection of human health and the environment²³⁷.

In 2019, the triple COPs (COP 14 to the Basel Convention “BC COP 14”; COP 9 to the Rotterdam Convention “RC COP 9”; and COP 9 to the Stockholm Convention “SC COP 9”) were held in Geneva and marine plastic litter and microplastics were addressed in all three meetings, both individually and collectively. The potential for negotiating a new international LBI to regulate plastic pollution and related hazardous substances was also discussed²³⁸.

The report of the 2019 BRC COP, reveals that the meetings

(...) also provided an opportunity to address the challenge of plastics; as the only global convention specifically on waste, the Basel Convention needed an approach to plastics that was as comprehensive as possible, based on a new regulatory framework and stronger cooperation, particularly with the private sector, to implement broader, more appropriate solutions²³⁹.

One of the outcomes of the 2019 Triple COP was the creation of the Plastic Waste Partnership under the Basel Convention, aimed at enhancing and promoting the environmentally sound management of plastic waste. Its long-term goal is to eliminate the release of plastic waste and microplastics into the marine environment²⁴⁰.

The COPs of the Rotterdam and Stockholm Conventions also instructed their respective Secretariats to collaborate closely with other international organisations, within their mandates, on activities related to marine plastic litter and microplastics²⁴¹.

²³⁷ Paragraphs 14 and 16 of the Appendix II “Key messages emerging from the high-level segment of the conferences of the Parties to the Basel, Rotterdam and Stockholm conventions”. In: UNEP; FAO (2017). Report of the Conference of the Parties to the Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade on the work of its eighth meeting (UNEP/FAO/RC/COP.8/27). Geneva, 24 April–5 May 2017. Available at: <https://www.brsmeas.org/Decisionmaking/COPsandExCOPs/2017COPs/2017COPs/Overview/tabid/5306/ctl/Download/mid/18530/language/en-US/Default.aspx?id=5&ObjID=44957>. Accessed on 19 May 2023.

²³⁸ UNEP (2019b). Report of the Conference of the Parties to the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal on the work of its fourteenth meeting (UNEP/CHW.14/28). Available at: <https://www.brsmeas.org/Decisionmaking/COPsandExCOPs/2019COPs/Overview/tabid/7523/ctl/Download/mid/22150/language/es-CO/Default.aspx?id=5&ObjID=22103>. Accessed on 17 June 2023.

²³⁹ Paragraph 5, opening remarks of the Report of the Basel Convention on the work of its fourteenth meeting (UNEP/CHW.14/28).

²⁴⁰ The Terms of Reference for the Plastic Waste Partnership are outlined in the document UNEP/CHW.14/INF/16/Rev.1 In: UNEP (2019d). Terms of reference for the Basel Convention Partnership on Plastic Waste and workplan for the working group of the Partnership on Plastic Waste for the biennium 2020–2021. Available at: <https://www.basel.int/Portals/4/download.aspx?d=UNEP-CHW.14-INF-16-Rev.1.English.pdf>. Accessed on 17 November 2024.

²⁴¹ As Decision RC 9/9 reads: “To continue to work closely with other international organizations, within the scope of their mandates, on activities related to marine plastic litter and microplastics”. In: Secretariat of the Rotterdam Convention (2019). RC-9/9: International cooperation and coordination. Available at: <https://www.pic.int/TheConvention/ConferenceoftheParties/Meetings/COP9/Overview/tabid/7528/language/en-%20US/Default.aspx>. Accessed on 15 September 2023.

The Basel Convention complements the roles of the Stockholm and Rotterdam Conventions: together, they establish regulations on various aspects of managing environmentally hazardous materials, with the goal of restricting and controlling the production, use, and trade of hazardous chemicals, both in production processes and as waste.

When it comes to plastics specifically, these points of convergence between the Stockholm, Rotterdam and Basel Conventions demonstrate that the international community has been acting for some time to address the problems arising from plastic pollution – especially regarding its dangerousness and toxicity – but still lacks the speed needed to address the problem due to its magnitude and urgency. In fact, it would be useful to enhance the categorization of hazardous components in plastic production and treatment under the Basel, Stockholm, and Rotterdam Conventions²⁴².

While, on the one hand, some amendments to convention annexes are being slowly negotiated, on the other hand, the effects of plastic pollution are spreading rapidly and drastically, leaving many gaps to be addressed by international law – such as addressing the entire life cycle of plastics, establishing effective mechanisms to mitigate the effects of pollution, among other topics that require greater caution.

There is also a pressing need to classify plastic waste (at least some types of it) as hazardous, so that efforts can be made to find new, safer polymers able to replace it²⁴³. Plastics are no longer seen as a concern regarding marine litter – rather, they are increasingly being discussed as materials made from chemicals and the consequences arising from it²⁴⁴.

The use and mismanagement of these products by the public contributes to the increase in plastic pollution, which will be common debris found in the environment for decades²⁴⁵, potentially affecting ecosystems and the development of the global economy.

Finally, when it comes to the Rotterdam Convention, specifically, its purpose is to provide information on the trade of specific chemicals – the PIC procedure aims to protect human health and the environment by ensuring that countries are fully informed about the hazards associated with chemicals and have the right to make informed decisions

²⁴² UNEP (2017a). *Ob. cit.*, p. 100.

²⁴³ Rochman, C.M.; *et. al.* (2013). *Ob. cit.*, p. 170.

²⁴⁴ Volcovici, V. (2022). Countries split on plastics treaty focus as U.N. talks close. **Reuters**, Environment, December 3, 2022. Available at: <https://www.reuters.com/business/environment/countries-split-plastics-treaty-focus-un-talks-close-2022-12-03/>. Accessed on 12 January 2023.

²⁴⁵ Prata, J.C.; *et. al.* (2020). Covid-19 Pandemic Repercussions on the Use and Management of Plastics. **Environmental Science & Technology**, vol. 54, n. 13, p. 7761. DOI: <https://doi.org/10.1021/acs.est.0c02178>. Available at: <https://pubs.acs.org/doi/pdf/10.1021/acs.est.0c02178>. Accessed on 30 November 2021.

regarding their import and use. The Convention, however, was not designed to regulate the production and use of chemicals and does not directly govern or regulate plastics or associated chemicals. As a result, chemicals listed in Annex III do not face any restrictions on their production and use under the Convention²⁴⁶.

- *Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter (London Convention) and 1996 London Protocol (London Protocol)*

Marine pollution from dumping has been a concern for the international community since the early days of international environmental law, driving significant progress in its development. While the initial response to these concerns was regional²⁴⁷, it quickly became clear that global and cooperative action was necessary.

Consequently, at the end of 1972, the International Maritime Organization (IMO) held a diplomatic conference that resulted in the adoption of the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter later that year – commonly known as the London Convention²⁴⁸.

The London Convention, hence, is one of the earliest global agreements aimed at protecting the marine environment from human activities and has been in force since 1975²⁴⁹ – which is of great significance. As of now, 87 States are Parties to this Convention²⁵⁰.

²⁴⁶ BRS (2023). *Ob. cit.*, p. 58.

²⁴⁷ In 1972, States bordering the North-East Atlantic adopted the Oslo Convention for the prevention of marine pollution by dumping from ships and aircraft. This convention was later absorbed by the Convention for the Protection of the Marine Environment of the North-East Atlantic, which was open for signature at Paris, from 22nd September 1992 to 30th June 1993. Such Convention is also known as the “OSPAR Convention” and entered into force on 25 March 1998. In: OSPAR Commission (1992). The OSPAR Convention for the Protection of the Marine Environment of the North-East Atlantic. Available at: https://www.ospar.org/site/assets/files/1169/ospar_convention.pdf. Accessed on 04 October 2024.

²⁴⁸ Farnelli, G.N.; Tanzi, A. (2017). Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter 1972 and 1996 Protocol. In: **Elgar Encyclopedia of Environmental Law**. Cheltenham, UK: Edward Elgar Publishing, p. 175-176. DOI: <https://doi.org/10.4337/9781783477210.V.16>. Available at: [https://www.elgaronline.com/configurable/content/book\\$002f9781785369520\\$002fb-9781783477210-V_16.xml?t:ac=book%24002f9781785369520%24002fb-9781783477210-V_16.xml](https://www.elgaronline.com/configurable/content/book$002f9781785369520$002fb-9781783477210-V_16.xml?t:ac=book%24002f9781785369520%24002fb-9781783477210-V_16.xml). Accessed on 12 July 2023.

²⁴⁹ IMO (2022). Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter. Home – Our Work – Marine Environment. Available at: <https://www.imo.org/en/OurWork/Environment/Pages/London-Convention-Protocol.aspx>. Accessed on 17 November 2024.

²⁵⁰ The 46th Consultative Meeting of Contracting Parties to the London Convention and the 19th Meeting of Contracting Parties to the London Protocol (LC 46/LP 19) met at the International Maritime Organization (IMO) Headquarters from 28 October - 1 November 2024. In: IMO (2024a). 46th Consultative Meeting of Contracting Parties to the London Convention and the 19th Meeting of Contracting Parties to the London Protocol (LC 46/LP 19). Home – Media Centre – Meeting Summaries. Available at: <https://www.imo.org/en/MediaCentre/MeetingSummaries/Pages/LC-46-LP-19.aspx>. Accessed on 17 November 2024.

The London Convention's goal is to ensure effective control over all sources of marine pollution and to take all feasible measures to prevent the pollution of the sea through the dumping of wastes and other materials²⁵¹. Like other regional instruments concerning waste dumping, the London Convention, however, does not seek to prohibit the activity entirely but instead aims to regulate it²⁵².

One of the London Convention's notable features is its explicit prohibition of dumping "*persistent plastics and other persistent synthetic materials, for example, netting and ropes, which may float or may remain in suspension in the sea (...)*". This provision can be found in Article IV (1) "a", in conjunction with Annex I (4)²⁵³.

Although plastics are directly addressed, it is worth noting that the Convention does not provide a definition for plastics or for plastic waste. The absence of a clear definition may stem from the variety of plastics, which are categorised by their chemical formulas (e.g., single-polymer plastics like PET or PP, and composite plastics made from various polymer types or other materials)²⁵⁴.

Moreover, the material scope of the Convention covers all ships flying the flag of a Member State Party²⁵⁵ that are dumping waste into the sea. Article VII further establishes Port State control, requiring State Parties to prevent marine pollution by dumping from

(a) vessels and aircraft registered in its territory or flying its flag; (b) vessels and aircraft loading in its territory or territorial seas matter which is to be dumped; (c) vessels and aircraft and fixed or floating platforms under its jurisdiction believed to be engaged in dumping²⁵⁶.

The determination of the subjective scope of the Convention, differently, is more complex. According to the principle of *pacta tertiis nec nocent nec prosunt*²⁵⁷, only the Contracting Parties should be bound by it²⁵⁸. Nevertheless, in the 1995 Report on the Law

²⁵¹ Article 1 of the London Convention. In: IMO (1972). *Ob. cit.*, n.p.

²⁵² Farnelli, G.N.; Tanzi, A. (2017). *Ob. cit.*, p. 177.

²⁵³ London Convention, Article IV (1) a, in conjunction with Annex I (4).

²⁵⁴ Lesniewska, L.; Steenmans, K. (2023). **Circular Economy and the Law: Bringing Justice into the Frame**. 1st Edition. London: Routledge (174 p), p. 72-73. ISBN: 978-0-367-37533-1. DOI: 10.4324/9780429355141.

²⁵⁵ In contrast to general international law, Article VII (4) stipulates that although the Convention does not apply to ships entitled to sovereign immunity, "(...) each Party shall ensure by the adoption of appropriate measures that such vessels and aircraft owned or operated by it act in a manner consistent with the object and purpose of this Convention and shall inform the Organization accordingly". As a result, warships and other vessels on governmental duty are indirectly obligated to comply with the provisions of the London Convention.

²⁵⁶ London Convention, Article VII (1).

²⁵⁷ Treaties neither harm nor benefit third parties.

²⁵⁸ Farnelli, G.N.; Tanzi, A. (2017). *Ob. cit.*, p. 178.

of the Sea, the Secretary General of the UN stated that the provisions of the London Convention constitute the “global rules and standards” by which States are expected to prevent, reduce, and control marine pollution by dumping²⁵⁹, as outlined in Article 210 (4) of UNCLOS²⁶⁰. Therefore, it can be argued that the substantive provisions of the London Convention also apply to all UNCLOS Contracting Parties.

Further, the inclusion of Annex I to the London Convention occurred only in 2006, through the 1996 London Protocol, which came into force that year – currently having 55 Parties²⁶¹ – and was designed to modernise the Convention and eventually replace it²⁶².

The London Protocol’s purpose aligns with that of the London Convention, but it is more stringent. It incorporates a “precautionary approach” as a general obligation and adopts a “reverse list” method, meaning that all dumping is prohibited unless explicitly authorised²⁶³. The Protocol also prohibits the incineration of wastes at sea and the export of wastes for the purpose of dumping or incineration in the ocean²⁶⁴. It includes enhanced compliance procedures and provisions for technical assistance. Moreover, a transitional period allows new Contracting Parties to gradually comply with the Protocol over five years, provided certain conditions are met²⁶⁵.

In addition, Article XII of the London Convention outlines the substances that States Parties should prevent from polluting, though it does not specifically mention plastics

- (a) hydrocarbons, including oil and their wastes; (b) other noxious or hazardous matter transported by vessels for purposes other than dumping; (c)

²⁵⁹ As it reads in paragraphs 106 and 107: “The 1972 London Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter is undergoing a substantial amendment process. A diplomatic conference in 1996 is expected to adopt a protocol extensively amending the Convention. The entry into force of the Convention on the Law of the Sea is therefore of considerable, and immediate, interest. The 1994 Consultative Meeting of Contracting Parties noted that States parties to the Convention on the Law of the Sea would be legally bound to adopt laws and regulations and take other measures to prevent, reduce and control pollution by dumping. These must be no less effective than the global rules and standards referred to in article 210 of the Convention. These global rules and standards were considered to be those of the London Convention 1972 (see A/49/631, paras. 84-85).” In: UNGA (1995). LAW OF THE SEA – Report of the Secretary-General (A/50/713). Fiftieth session, Agenda item 39. Available at: <https://documents.un.org/doc/undoc/gen/n95/337/72/pdf/n9533772.pdf>. Accessed on 13 November 2024.

²⁶⁰ Which reads: “States, acting especially through competent international organizations or diplomatic conference, shall endeavour to establish global and regional rules, standards and recommended practices and procedures to prevent, reduce and control such pollution. Such rules, standards and recommended practices and procedures shall be re-examined from time to time as necessary”.

²⁶¹ IMO (2024a). *Ob. cit.*, n.p.

²⁶² IMO (2022). *Ob. cit.*, n.p.

²⁶³ London Protocol, Article 3 “General Obligations”. In: IMO (2006). 1996 Protocol to the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, 1972 (as amended in 2006). Available at: <https://wwwcdn.imo.org/localresources/en/OurWork/Environment/Documents/PROTOCOLAmended2006.pdf>. Accessed on 17 September 2024.

²⁶⁴ London Protocol, Articles 5 and 6.

²⁶⁵ IMO (2022). *Ob. cit.*, n.p.

wastes generated in the course of operation of vessels, aircraft, platforms and other man-made structures at sea; (d) radio-active pollutants from all sources, including vessels; (e) agents of chemical and biological warfare; (f) wastes or other matter directly arising from, or related to the exploration, exploitation and associated off-shore processing of sea-bed mineral resources²⁶⁶.

In terms of support for national authorities, the contracting parties developed guidelines for regulating ocean dumping and for fulfilling their obligations under the two instruments. Specific guidelines are provided for the materials listed in Annex I of the London Convention²⁶⁷.

It should be stressed that, for many years, discussions about the application and effectiveness of the London Convention led to the creation of multiple protocols and assessment procedures. In this context, one contracting state is required

No later than two years after the entry into force of this Protocol, the Meeting of Contracting Parties shall establish those procedures and mechanisms necessary to assess and promote compliance with this Protocol. Such procedures and mechanisms shall be developed with a view to allowing for the full and open exchange of information, in a constructive manner²⁶⁸.

The London Convention does not have compliance mechanisms; however, with the entry into force of the London Protocol, a set of Compliance Procedures and Mechanisms were adopted in November 2007 and later revised in 2017²⁶⁹.

The aim of these Compliance Procedures and Mechanisms is to evaluate and promote adherence to the London Protocol, facilitating the full and transparent exchange of information in a constructive manner. The Meeting of Contracting Parties holds ultimate responsibility for compliance matters.

As part of the procedures, a subsidiary body called the Compliance Group was established at the 29th Consultative Meeting. This group meets before or alongside the Meeting of Contracting Parties and offers guidance to the Protocol's Contracting Parties on compliance issues²⁷⁰.

Finally, the effectiveness of the London Convention and Protocol (LC&P)

²⁶⁶ London Convention, Article XII.

²⁶⁷ London Convention, Annex I.

²⁶⁸ London Protocol, Article 11 (1).

²⁶⁹ IMO (2017a). Annex 5 – Revised 2017 Compliance Procedures and Mechanisms. Revised 2017 Compliance Procedures and Mechanisms Pursuant to Article 11 of the 1996 Protocol to the London Convention 1972 (adopted in 2007: LC 29/17, annex 7). Available at: <https://wwwcdn.imo.org/localresources/en/OurWork/Environment/Documents/Revised%202017%20CP%20M.pdf>. Accessed on 13 February 2023.

²⁷⁰ IMO (2017c). Compliance with the London Convention and Protocol. Home – Our Work – Marine Environment. Available at: <https://www.imo.org/en/OurWork/Environment/Pages/Compliance-default.aspx>. Accessed on 15 February 2023.

primarily depends on their ability to attract participation to raise environmental awareness. A key disincentive for participation is the cost associated with waste disposal – when compared with sea dumping. At the same time, the factors discussed regarding Article 210 of UNCLOS may also influence participation. As noted, UNCLOS Members that are not also Contracting Parties to the LC&P are still bound by its substantive provisions – yet they lack the ability to influence the direction of the Convention. This indirect binding effect could encourage their participation in both the instruments to better protect and promote their interests²⁷¹.

In any case, the LC&P should be regarded as a significant achievement in marine environmental protection. Nevertheless, when specifically considering the ability to address marine plastic pollution, the London Convention is even more limited.

The London Convention could be understood as prohibiting the dumping of persistent plastics only if they “*float or may remain in suspension in the sea in such a manner as to interfere materially with fishing, navigation or other legitimate uses of the sea*”²⁷². This excludes many types of plastics that sink rapidly, as well as microplastics. The London Protocol does address this gap by prohibiting all dumping (including of plastics) into the ocean – however, it allows dredged material (listed in Annex 1) to be considered for dumping, provided that the permit conditions align with the provisions outlined in Annex 2²⁷³.

For these wastes, contamination sources must be controlled through the implementation of waste prevention strategies and “*until this objective is met, the problems of contaminated dredged material may be addressed by using disposal management techniques at sea or on land*”²⁷⁴.

Historically, this has allowed microplastics to be dumped into the ocean within sewage sludge and dredged material²⁷⁵. Dredged material from coastal areas, including harbours, may contain macro- and microplastics, often from multiple land-based sources. Efforts to eliminate unnecessary and avoidable sources of microplastics should focus on phasing them out as part of broader efforts to combat plastic pollution, with exemptions for “essential uses”, while promoting innovative alternatives and practices to reduce

²⁷¹ Farnelli, G.N.; Tanzi, A. (2017). *Ob. cit.*, p. 182.

²⁷² London Convention, Annex I (4).

²⁷³ IMO (2006). *Ob. cit.*, n.p.

²⁷⁴ London Protocol, Annex 2.

²⁷⁵ Measures to reduce contamination in sewage sludge could include installing washing machine filters to capture microfibers before they reach sewage treatment plants, as well as eliminating intentionally added microbeads in household products.

waste generation and emissions²⁷⁶.

- *International Convention for the Prevention of Pollution from Ships (MARPOL)*

The International Convention for the Prevention of Pollution from Ships (MARPOL) is the primary international agreement addressing marine pollution from ships, whether caused by operational activities or accidents²⁷⁷.

Adopted on November 2, 1973, at the IMO, the MARPOL Convention regulates ship-based sources of pollution which are connected to the obligations outlined in Article 211 “*Pollution from vessels*” of UNCLOS²⁷⁸. Like the LC&P, MARPOL also addresses marine pollution. Nevertheless, the London Convention deals with the direct disposal of waste into the sea, while MARPOL focuses on shipborne operations. They are both governed by IMO but differ significantly in nature²⁷⁹.

MARPOL was followed by the 1978 Protocol in response to a series of tanker accidents in 1976-1977. Since the 1973 Convention had not yet entered into force, the 1978 Protocol incorporated it, and the combined instrument entered into effect on October 2, 1983²⁸⁰ – since then, MARPOL has been revised and updated through various amendments over the years.

MARPOL Annex V, which governs the disposal of solid waste, came into force on 31 December 1988 – and is known as a living document²⁸¹. However, it was not amended to impose a complete ban on waste disposal until 1 January 2013 (Fig. 5)²⁸²:

²⁷⁶ BRS (2023). *Ob. cit.*, p. 69.

²⁷⁷ IMO (2011). International Convention for the Prevention of Pollution from Ships (MARPOL). Home – About IMO – Conventions. Available at: [https://www.imo.org/en/about/Conventions/Pages/International-Convention-for-the-Prevention-of-Pollution-from-Ships-\(MARPOL\).aspx](https://www.imo.org/en/about/Conventions/Pages/International-Convention-for-the-Prevention-of-Pollution-from-Ships-(MARPOL).aspx). Accessed on 15 October 2023.

²⁷⁸ Jung, D. (2023). An International Legal Framework for Marine Plastics Pollution. In: **The Environmental Rule of Law for Oceans: Designing Legal Solutions**. Editors Platjouw FM, Pozdnakova A. Cambridge University Press, p. 48. Available at: <https://www.cambridge.org/core/books/environmental-rule-of-law-for-oceans/an-international-legal-framework-for-marine-plastics-pollution/297AD3C347FCBB475F36881EB558AE65>. Accessed on 13 March 2024.

²⁷⁹ Nauke, M.; Holland, G.L. (1992). The Role and Development of Global Marine Conventions Two Case Histories. **Marine Pollution Bulletin**, vol. 25, n. 1-4, p. 74. DOI: [https://doi.org/10.1016/0025-326X\(92\)90190-H](https://doi.org/10.1016/0025-326X(92)90190-H). Available at: <https://www.sciencedirect.com/science/article/abs/pii/S0025326X9290190H>. Accessed on 13 August 2022.

²⁸⁰ IMO (2011). *Ob. cit.*, n.p.

²⁸¹ IMO (2024c). Prevention of Pollution by Garbage from Ships. Background of MARPOL Annex V. Available at: <https://www.imo.org/en/ourwork/environment/pages/garbage-default.aspx>. Accessed on 17 June 2024.

²⁸² Serra-Gonçalves, C.; *et. al.* (2023). Assessing the effectiveness of MARPOL Annex V at reducing marine debris on Australian beaches. **Marine Pollution Bulletin**, vol. 191, p. 1. Available at: <https://www.sciencedirect.com/science/article/pii/S0025326X23003600>. Accessed on 12 July 2023.

Figure 5 – Simplified overview of the discharge provisions of the revised MARPOL Annex V which entered into force on 1 January 2013²⁸³

Type of garbage	Ships outside special areas	Ships within special areas	Offshore platforms and all ships within 500 m of such platforms
All other garbage including plastics, domestic wastes, cooking oil, incinerator ashes, operational wastes and fishing gear	Discharge prohibited	Discharge prohibited	Discharge prohibited

Source: IMO (2013). Simplified overview of the discharge provisions of the revised MARPOL Annex V which entered into force on 1 January 2013.

The Annex V, although optional, counts with 154 States Parties – representing 98.56% of the global shipping tonnage²⁸⁴ – and contains an express reference to plastics in the document, prohibiting the discharge of all plastics into the sea, as outlined in Regulation 3:

Garbage includes all kinds of food wastes, domestic wastes and operational wastes, all plastics, cargo residues, incinerator ashes, cooking oil, fishing gear, and animal carcasses generated during the normal operation of the ship. The discharge of garbage into the sea from ships is prohibited, except in some limited circumstances as outlined in this Notice. The discharge into the sea of all plastics, including but not limited to synthetic ropes, synthetic fishing nets, plastic garbage bags and incinerator ashes from plastic products is prohibited²⁸⁵. (author's emphasis)

Later, in 2018, additional provisions were introduced to Annex V (Fig. 6):

²⁸³ IMO (2013). Simplified overview of the discharge provisions of the revised MARPOL Annex V which entered into force on 1 January 2013. Available at: <https://wwwcdn.imo.org/localresources/en/OurWork/Environment/Documents/Annex%20V%20discharge%20requirements%2007-2013.pdf>. Accessed on 16 November 2024.

²⁸⁴ Nagtzaam, G.; *et. al.* (2023). *Ob. cit.*, p. 176.

²⁸⁵ Annex V of the International Convention for the Prevention of Pollution from Ships. In: The Bahamas Maritime Authority (2022). MARPOL Annex V. Marine Notice 60. Available at: <https://www.bahamasmaritime.com/wp-content/uploads/2022/03/MN060-MARPOL-Annex-V-v1.0.pdf>. Accessed on 13 October 2024.

Figure 6 – Simplified overview of the discharge provisions of the revised MARPOL Annex V which entered into force on 1 March 2018²⁸⁶

Garbage type	All ships except platforms		Regulation 5 Offshore platforms located more than 12 nm from nearest land and ships when alongside or within 500 metres of such platforms
	Regulation 4 Outside special areas and Arctic waters (Distances are from the nearest land)	Regulation 6 Within special areas and Arctic waters (Distances are from nearest land, nearest ice-shelf or nearest fast ice)	
All other garbage including plastics, synthetic ropes, fishing gear, plastic garbage bags, incinerator ashes, clinkers, cooking oil, floating dunnage, lining and packing materials, paper, rags, glass, metal, bottles, crockery and similar refuse	Discharge prohibited	Discharge prohibited	Discharge prohibited

Source: IMO (2018b). Simplified overview of the discharge provisions of the revised MARPOL Annex V which entered into force on 1 March 2018.

The key aspect of Annex V is the outright ban on the disposal of all forms of plastics into the sea. The only exceptions to this prohibition are those listed in Regulation 7, which are typical legal exceptions, such as accidents or the need to protect life²⁸⁷.

Although the general prohibition implicitly covers the discharge of plastics, the revised Annex explicitly emphasises the ban on plastic discharge. To reinforce this, plastics and fishing gear are included in the definition of garbage (regulation 1.9), and separate definitions for plastic (regulation 1.13)²⁸⁸ and fishing gear (regulation 1.6) are also provided

Regulation 1.6 Fishing gear means any physical device or part thereof or combination of items that may be placed on or in the water or on the sea-bed with the intended purpose of capturing, or controlling for subsequent capture or harvesting, marine or fresh water organisms.

Regulation 1.9 Garbage means all kinds of food wastes, domestic wastes and operational wastes, all plastics, cargo residues, incinerator ashes, cooking oil, fishing gear, and animal carcasses generated during the normal operation of the ship and liable to be disposed of continuously or periodically except those substances which are defined or listed in other Annexes to the present

²⁸⁶ IMO (2018b). Simplified overview of the discharge provisions of the revised MARPOL Annex V which entered into force on 1 March 2018. Available at: <https://wwwcdn.imo.org/localresources/en/OurWork/Environment/Documents/Simplified%20overview%20of%20the%20discharge%20provisions%20of%20the%20revised%20MARPOL%20Annex%20V.pdf>. Accessed on 12 November 2022.

²⁸⁷ Regulation 7 - Annex V of the International Convention for the Prevention of Pollution from Ships. In: The Bahamas Maritime Authority (2022). *Ob. cit.*, n.p.

²⁸⁸ It is noteworthy that, as of now, there are only three legally binding definitions related to “plastics”. In addition to MARPOL Annex V, these include the Convention on the Harmonized Commodity Description and Coding System and the Barcelona Convention Regional Plan. For the purposes of this research, however, considering that the last 2 instruments fall outside its scope, they are not analysed in this thesis.

Convention. Garbage does not include fresh fish and parts thereof generated as a result of fishing activities undertaken during the voyage, or as a result of aquaculture activities which involve the transport of fish including shellfish for placement in the aquaculture facility and the transport of harvested fish including shellfish from such facilities to shore for processing.

Regulation 1.13 Plastic means a solid material which contains as an essential ingredient one or more high molecular mass polymers and which is formed (shaped) during either manufacture of the polymer or the fabrication into a finished product by heat and/or pressure. Plastics have material properties ranging from hard and brittle to soft and elastic. For the purposes of this annex, “all plastics” means all garbage that consists of or includes plastic in any form, including synthetic ropes, synthetic fishing nets, plastic garbage bags and incinerator ashes from plastic products²⁸⁹.

Beside these regulations, if garbage is mixed with or contaminated by plastics, its discharge is also prohibited (Reg. 4.4), and each Party is required to ensure that adequate facilities are available at ports and terminals for the reception of garbage (Reg. 8.1)²⁹⁰.

Parties are required to ensure that every discharge to a reception facility, as well as completed incinerations, is recorded in a Garbage Record Book (Reg. 10.3.1). Additionally, any discharge allowed under exemptions to the ban on plastic discharge must also be recorded in either the Garbage Record Book or the ship’s logbook, including details about the items discharged or lost, the location, circumstances, and reasons for the discharge or loss (Reg. 10.3.4). If the discharged material is fishing gear that poses a significant threat to the marine environment or navigation, it must be reported to both the Flag State and the Coastal State, if applicable (Reg. 10.6)²⁹¹.

MARPOL Annex V ensures transparency by granting the government of the port or offshore terminal a ship is visiting the authority to inspect and copy the relevant Garbage Record Book or logbook. This includes details of each discharge into a reception facility, completed incineration, exempted discharges, or accidental loss of plastics (Regulations 10.3 and 10.5)²⁹².

However, the Administration may exempt vessels engaged in voyages lasting one hour or less, as well as fixed or floating platforms, from the requirement to maintain a Garbage Record Book²⁹³.

²⁸⁹ IMO (2024b). Statement by the International Maritime Organization (IMO) at INC-5. Available at: https://resolutions.unep.org/incres/uploads/statement_by_the_international_maritime_organization_inc-5.pdf. Accessed on 08 December 2024.

²⁹⁰ The Bahamas Maritime Authority (2022). *Ob. cit.*, n.p.

²⁹¹ IMO (2017b). Annex 21 – Resolution MEPC.295(71) (Adopted on 7 July 2017). 2017 Guidelines for the implementation of MARPOL Annex V (MEPC 71/17/Add.1). Available at: [https://wwwcdn.imo.org/localresources/en/OurWork/Environment/Documents/MEPC.295\(71\).pdf](https://wwwcdn.imo.org/localresources/en/OurWork/Environment/Documents/MEPC.295(71).pdf). Accessed on 13 March 2022.

²⁹² IMO Rules (2024). Regulation 10 - Placards, garbage management plans, and garbage record-keeping. MARPOL Annex V. Available at: <https://www.imorules.com/GUID-8B16B4C8-D055-4ED1-B7EB-52B4C507EF3E.html>. Accessed on 19 December 2024.

²⁹³ BRS (2023). *Ob. cit.*, p. 65.

Furthermore, although MARPOL – particularly Annex V – addresses waste generated by ships and expressly forbids the disposal of plastics into the sea, the enforcement of these rules remains uneven across jurisdictions. In many cases, states either lack the necessary infrastructure or the political will to ensure effective compliance – and thus enforcement varies by country –, resulting in ongoing illegal dumping and inadequate waste management practices.

Another limitation of MARPOL is the longstanding issue of flags of convenience, where ship owners often choose to register their vessels under flags with lower regulatory standards²⁹⁴, or in some cases, flags that are not parties to MARPOL.

To ensure the effectiveness of the Convention, several measures must be implemented. More recently, on 26 October 2018, IMO Member States agreed on an Action Plan to be completed by 2025 under the MARPOL Convention, applicable to all ships, including fishing vessels, to address ship-sourced litter²⁹⁵.

Specific measures include improving the availability, adequacy, and affordability of port reception facilities, raising public awareness, and strengthening international cooperation. Additionally, management strategies need to encourage fishers and seafarers to return garbage to port (e.g., through environmental education and rewards) and develop waste recycling practices (e.g., a CE)²⁹⁶.

Following the adoption of the action plan, in 2021, the IMO's Marine Environment Protection Committee (MEPC) adopted its Strategy to tackle marine plastic litter from ships. The strategy outlines goals to reduce marine plastic litter generated by and retrieved from fishing vessels, decrease shipping's contribution to marine plastic pollution, and enhance the effectiveness of port reception facilities and waste treatment in reducing marine plastic litter²⁹⁷.

In conclusion, while MARPOL can be considered relevant due to its mandatory technical framework, its limitations highlight areas for improvement. Enhancing the

²⁹⁴ Ford, J.H.; Wilcox, C. (2019). Shedding light on the dark side of maritime trade – A new approach for identifying countries as flags of convenience. **Marine Policy**, vol. 99, p. 298. DOI: <https://doi.org/10.1016/j.marpol.2018.10.026>. Available at: <https://www.sciencedirect.com/science/article/pii/S0308597X18303257>. Accessed on 17 April 2024.

²⁹⁵ IMO (2018a). Action Plan to address marine plastic litter from ships. Annex 10 – Resolution MEPC.310(73) (adopted on 26 October 2018). Available at: <https://wwwcdn.imo.org/localresources/en/MediaCentre/HotTopics/Documents/IMO%20marine%20litter%20action%20plan%20MEPC%2073-19-Add-1.pdf>. Accessed on 15 August 2024.

²⁹⁶ Serra-Gonçalves, C.; *et al.* (2023). *Ob. cit.*, p. 11.

²⁹⁷ IMO (2021). Strategy to Address Marine Plastic Litter from Ships. Annex 2 – Resolution MEPC.341(77) (adopted on 26 November 2021). Available at: <https://wwwcdn.imo.org/localresources/en/MediaCentre/HotTopics/Documents/marine%20litter/STRATEGY%20TO%20ADDRESS%20MARINE%20PLASTIC%20LITTER%20FROM%20SHIPS.pdf>. Accessed on 15 August 2024.

effectiveness of MARPOL Annex V calls for stricter enforcement mechanisms, more robust monitoring systems, and an extension of its scope to include land-based sources of pollution.

The Convention has the potential to reduce debris from ocean-based sources, but alone it is insufficient in addressing the problem in the long term – as it has not yet addressed the “root cause” of the issue, *i.e.* the land-based plastic pollution entering the marine environment²⁹⁸.

- *Convention on Biological Diversity (CBD)*

The connection between the Convention on Biological Diversity (CBD) and the marine plastic pollution phenomenon is not as direct as with other international agreements. Nevertheless, it remains significant because plastics have a profound impact on nature and marine life. This is acknowledged by the CBD itself, which defines “biological diversity” as the “*variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems*” and emphasises that “*it is vital to anticipate, prevent and attack the causes of significant reduction or loss of biological diversity at source*”²⁹⁹.

The CBD has near-universal participation, with 196 Parties³⁰⁰, and among its objectives – besides conserving biological diversity –, it aims to promote

the sustainable use of its components and the fair and equitable sharing of the benefits arising out of the utilization of genetic resources, including by appropriate access to genetic resources and by appropriate transfer of relevant technologies, taking into account all rights over those resources and to technologies, and by appropriate funding³⁰¹.

While the approach to pollution remains general, the nature and scope of the document suggest that plastic pollution is implicitly included.

The COPs of the CBD have a significant impact, and the marine environment has been a key issue since COP 2, which happened in 1995. During COP 2, the decisions

²⁹⁸ Nagtzaam, G.; *et. al.* (2023). *Ob. cit.*, p. 187; and Chang, Y.-C.; Saqib, M. (2025). International Legal Systems in Tackling the Marine Plastic Pollution: A Critical Analysis of UNCLOS and MARPOL. **Water**, 17(10), 1547. DOI: <https://doi.org/10.3390/w17101547>. Available at: <https://www.mdpi.com/2073-4441/17/10/1547>. Accessed on 30 August 2025.

²⁹⁹ CBD, Article 2 “Use of Terms” and Preamble, Paragraph 8. In: UNEP (2011a). *Ob. cit.*, p. 2.

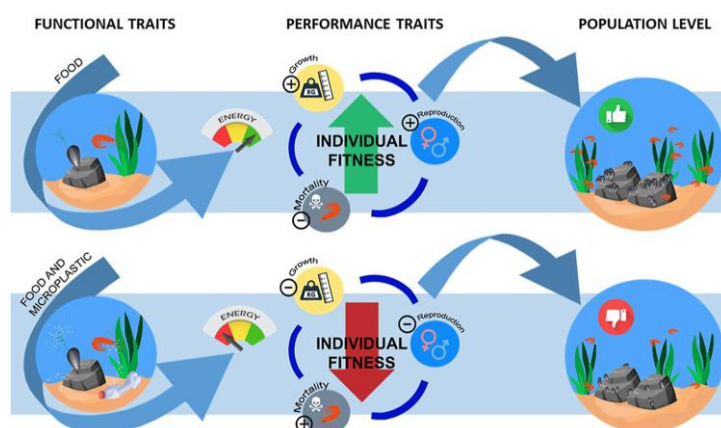
³⁰⁰ CBD Secretariat (2024). List of Parties. Convention on Biological Diversity. Available at: <https://www.cbd.int/information/parties.shtml>. Accessed on 22 April 2023.

³⁰¹ CBD, Article 1 – Objectives.

made on this topic were compiled into the Ministerial Statement known as the “*Jakarta Mandate on Marine and Coastal Biological Diversity*” (Jakarta Mandate)³⁰².

The Jakarta Mandate marked a significant advancement, as it created a checklist of concrete actions that Parties to the CBD should implement. It is a global consensus on the importance of marine and coastal biological diversity which also encourages major international organisations to enhance their current efforts and develop new initiatives to support the conservation and sustainable use of marine biodiversity. Additionally, it initiated a process within the CBD to address the most pressing threats to marine and coastal biodiversity³⁰³ – and (micro)plastics are among such threats

Figure 7 – The impact of microplastics on the functional traits of aquatic benthic organisms³⁰⁴



Source: Berlino, M.; *et. al.* (2021). Effects of microplastics on the functional traits of aquatic benthic organisms: A global-scale meta-analysis (graphical abstract).

There are many potential negative effects of microplastics on the functional traits of benthic organisms (Fig. 7), as benthic biodiversity plays a crucial role in regulating the functioning of marine ecosystems. The disruption of these functional traits can directly impact organismal performance and individual fitness, with far-reaching consequences for local population density and the expression of ecological functions on which goods and services rely on³⁰⁵.

Microplastics can also lead to physical blockages in the digestive tracts of

³⁰² UNEP (1995c). Report of the Second Meeting of the Conference of the Parties to the Convention on Biological Diversity. Second meeting Jakarta, 6-17 November 1995 (UNEP/CBD/COP/2/19). Available at: <https://www.cbd.int/doc/meetings/cop/cop-02/official/cop-02-19-en.pdf>. Accessed on 27 March 2023.

³⁰³ CBD Secretariat (2000). **The Jakarta Mandate** – from global consensus to global work. Conservation and sustainable use of marine and coastal biological diversity. Available at: <https://www.cbd.int/doc/publications/jm-brochure-en.pdf>. Accessed on 28 March 2023.

³⁰⁴ Berlino, M.; *et. al.* (2021). Effects of microplastics on the functional traits of aquatic benthic organisms: A global-scale meta-analysis. **Environmental Pollution**, vol. 285. DOI: <https://doi.org/10.1016/j.envpol.2021.117174>. Available at: <https://www.sciencedirect.com/science/article/pii/S0269749121007569>. Accessed on 25 August 2024.

³⁰⁵ Berlino, M.; *et. al.* (2021). *Ob. cit.*, p. 8.

organisms. The accumulation of these small plastic fragments might interfere with the normal functioning of organs, hinder nutrient absorption, and weaken the overall health and vitality of affected organisms. This disruption of physiological processes can ultimately result in reduced reproductive success, compromised immune systems, and a heightened vulnerability to other environmental stressors³⁰⁶.

At this point, it is important to consider the extent to which plastic pollution contributes to the loss of biodiversity. While pollution is a significant cause of ecosystem degradation, it may not always be the primary factor. Although plastic pollution is increasingly recognised as a major environmental threat, its impact on biodiversity – both in terms of scope and the ways it interacts with ecosystems – is still not entirely understood³⁰⁷.

Furthermore, while the Convention does not explicitly address pollution control, State Parties have adopted various decisions concerning marine litter due to its significant threat to marine species. Among those, for instance, an Annex with “*Voluntary practical guidance on preventing and mitigating the impacts of marine debris on marine and coastal biodiversity and habitats*”³⁰⁸ was included.

Member States recognise that the

Ingestion of plastics is also of concern as it may provide a pathway for the transport of harmful chemicals into the food web. Additionally, marine debris is known to damage, alter or degrade habitats (for example, by smothering) and to be a possible vector for the transfer of alien species. (...)

Microplastics are likely to increase in abundance, and are persistent pollutants that are present in all marine habitats. (...) There is evidence of transfer of chemical additives from ingested plastics into tissue, including human tissue. There is also concern that the ingestion of microplastics, as well as macro- and mesoplastics, can cause physical effects, such as internal abrasion, blockage and injury, and may also provide a pathway for the uptake of harmful chemicals (for example, additives contained in plastic products) by marine organisms³⁰⁹.

³⁰⁶ Ali, N.; *et al.* (2024). Insight into microplastics in the aquatic ecosystem: Properties, sources, threats and mitigation strategies. **Science of The Total Environment**, vol. 913, p. 10. DOI: <https://doi.org/10.1016/j.scitotenv.2023.169489>. Available at: <https://www.sciencedirect.com/science/article/pii/S0048969723081196>. Accessed on 19 December 2024.

³⁰⁷ Advancing scientific research and understanding to a level where States are confronted with a compelling case for adopting meaningful international standards will be essential. In: Goodwin, E. (2024). Plastics and biodiversity. In: **Research Handbook on Plastics Regulation** Law, Policy and the Environment. Editors Elizabeth A. Kirk, Naporn Popattanachai, Richard Barnes and Eva R. van der Marel. Cheltenham, UK: Edward Elgar Publishing, p. 103. ISBN: 978 1 80220 151 2. DOI: <https://doi.org/10.4337/9781802201529>, p. 103. Available at: <https://www.elgaronline.com/edcollbook/book/9781802201529/9781802201529.xml>. Accessed on 23 December 2024.

³⁰⁸ Annex to Decision CBD/COP/DEC/XIII/10 In: UNEP (2016f). XIII/10. Addressing impacts of marine debris and anthropogenic underwater noise on marine and coastal biodiversity. Decision adopted by the Conference of the Parties to the Convention on Biological Diversity (CBD/COP/DEC/XIII/10). Available at: <https://www.cbd.int/doc/decisions/cop-13/cop-13-dec-10-en.pdf>. Accessed on 28 March 2023.

³⁰⁹ UNEP (2016f). *Ob. cit.*, n.p.

For these reasons, priority actions for mitigating and preventing the impacts of marine debris on marine and coastal biodiversity and habitats were identified and, for land-based sources of marine debris, it is suggested that the Parties

Promote structural economic changes that would reduce the production and consumption of plastics, increase production of environmentally friendlier materials, and support the development of alternative materials, increase recycling and reuse and support an enabling environment for these changes through capacity-building, regulations and standards and cooperation among industry, governments and consumers³¹⁰. (...)

Develop and implement socioeconomic incentives to prevent the introduction of waste into the environment, such as levies for the sale of plastic bags and/or banning single-use plastic bags, in particular for coastal communities and coastal tourist resorts; (...)³¹¹.

Pollution was also covered under the Aichi Biodiversity Targets³¹² – though these were largely regarded as unmet by their 2020 deadline (at the global level, none of the 20 Aichi Biodiversity Targets, which were agreed upon by the Parties to the CBD in 2010, have been fully achieved). While plastic pollution was not specifically mentioned in these targets, a Post-2020 Global Biodiversity Framework – the Kunming-Montreal Global Biodiversity Framework (GBF) – was adopted by the end of 2022 at COP 15 of the CBD, outlining 23 action-oriented targets for Parties to achieve by 2030³¹³.

Under Target 7, Parties are tasked with

Reduce pollution risks and the negative impact of pollution from all sources by 2030, to levels that are not harmful to biodiversity and ecosystem functions and services, considering cumulative effects, including: (a) by reducing excess nutrients lost to the environment by at least half, including through more efficient nutrient cycling and use; (b) by reducing the overall risk from pesticides and highly hazardous chemicals by at least half, including through integrated pest management, based on science, taking into account food security and livelihoods; and (c) by preventing, reducing, and working towards eliminating plastic pollution³¹⁴.

The inclusion of plastic pollution in the GBF highlights its recognition as a major contributor to ecosystem degradation. However, the GBF's provisions are not legally binding, meaning their success relies entirely on the commitment and actions of individual States.

³¹⁰ Decision XIII/10, Paragraph 8.

³¹¹ Decision XIII/10, Paragraph 10 (e).

³¹² CBD Secretariat (2020). **Aichi Biodiversity Targets**. Available at: <https://www.cbd.int/sp/targets>. Accessed on 29 May 2023.

³¹³ UNEP (2022a). 15/4. **Kunming-Montreal Global Biodiversity Framework**. Decision adopted by the Conference of the Parties to the Convention on Biological Diversity (CBD/COP/DEC/15/4). Available at: <https://www.cbd.int/doc/decisions/cop-15/cop-15-dec-04-en.pdf>. Accessed on 22 March 2023.

³¹⁴ Kunming-Montreal Global Biodiversity Framework, target 7.

Before that, other concrete actions to address plastic pollution had been implemented through decisions made since COP 13, focusing on the marine environment and downstream solutions targeting plastic waste, though without addressing chemicals in plastics. The COP urged

Parties, and encourages other Governments and relevant international organizations to develop and implement measures, policies and instruments to prevent the discard, disposal, loss or abandonment of any persistent, manufactured or processed solid material in the marine and coastal environment (...) ³¹⁵.

The adoption of Extended Producer Responsibility (EPR) schemes is also recommended where appropriate “*for providing response measures where there is damage or sufficient likelihood of damage to marine and coastal biodiversity and habitats from marine debris*” ³¹⁶. Additionally, COP 14 urged Parties to strengthen efforts to prevent, minimise, and mitigate the impacts of plastic pollution on marine and coastal biodiversity and habitats ³¹⁷.

The CBD indirectly addresses the final stage of the plastic lifecycle, namely post-emission remediation. It includes a general obligation to rehabilitate and restore degraded ecosystems

Each Contracting Party shall, as far as possible and as appropriate: (...) (f) Rehabilitate and restore degraded ecosystems and promote the recovery of threatened species, inter alia, through the development and implementation of plans or other management strategies; (...) ³¹⁸.

Decision 14/10 underscores the importance of cleaning up and removing marine debris, emphasising the urgency of such actions when marine debris threatens sensitive marine and coastal biodiversity and habitats

Recognizes the need for further research on the impacts of marine debris, including plastics and microplastics, on marine and coastal biodiversity and habitats, and emphasizes the need for the clean-up and removal of marine debris, where appropriate and practical, and that such efforts are particularly urgent where marine debris poses a threat to sensitive marine and coastal biodiversity and habitats; (...) ³¹⁹.

In 2018, the COP to the CBD invited the UN General Assembly “*to designate the*

³¹⁵ Decision XIII/10, Paragraph 8.

³¹⁶ Decision XIII/10, Paragraph 7.

³¹⁷ Decision 14/10, Paragraph 1a. In: UNEP (2018a). 14/10. Other matters related to marine and coastal biodiversity. Decision adopted by the Conference of the Parties to the Convention on Biological Diversity (CBD/COP/DEC/14/10). Available at: <https://www.cbd.int/doc/decisions/cop-14/cop-14-dec-10-en.pdf>. Accessed on 23 April 2023.

³¹⁸ CBD, Article 8, paragraph f.

³¹⁹ Decision 14/10, Paragraph 4.

*decade 2021 to 2030 the United Nations Decade on Ecosystem Restoration*³²⁰, and following such invitation, the UNGA adopted Resolution 73/284, deciding to

to proclaim 2021–2030 the United Nations Decade on Ecosystem Restoration, within existing structures and available resources, with the aim of supporting and scaling up efforts to prevent, halt and reverse the degradation of ecosystems worldwide and raise awareness of the importance of successful ecosystem restoration; (...) ³²¹.

While this initiative does not specifically mention plastics, it highlights the removal of contaminants, pollutants, and other threats – referred to as remediation – as one of its focus areas

In the context of the UN Decade, ecosystem restoration encompasses a wide continuum of activities that contribute to protecting intact ecosystems and repairing degraded ecosystems. Such activities include, for example, enhancing organic carbon in agricultural soils, increasing fish stocks in overfished zones, remediating polluted sites, restoring ecological processes, restoring biodiversity and conserving fauna and flora that can assist in the restoration process³²².

The CBD also encourages Parties to report on the impacts of marine debris on marine and coastal biodiversity and habitats

For addressing knowledge gaps and research needs, the following actions are suggested:

(a) Support and promote, as appropriate, harmonized approaches to monitoring, analysis and reporting based on standardized methodologies, taking into account existing monitoring guidance for marine litter, such as the European Union Monitoring Guidance for Marine Litter in European Seas; (...) ³²³.

The global legal framework for combating (marine) plastic pollution, thus, could be enhanced by expanding on the CBD's obligation to rehabilitate and restore degraded ecosystems. This could include a requirement for the removal of legacy plastics³²⁴ from

³²⁰ Decision 14/10, Paragraph 39.

³²¹ Paragraph 1 of Resolution 73/284. In: UNGA (2019a). 73/284. United Nations Decade on Ecosystem Restoration (2021–2030). Resolution adopted by the General Assembly on 1 March 2019 (A/RES/73/284). Available at: <https://documents.un.org/doc/undoc/gen/n19/060/16/pdf/n1906016.pdf>. Accessed on 23 April 2023.

³²² UNEP (2020a). The United Nations Decade on Ecosystem Restoration – Strategy. Available at: <https://wedocs.unep.org/bitstream/handle/20.500.11822/31813/ERDStrat.pdf?sequence=1&isAllowed=y>. Accessed on 27 April 2023.

³²³ Decision XIII/10, Paragraph 12.

³²⁴ Every plastic item ever produced persists in some form and will continue to impact the environment for thousands of years. The history of plastic's primary component (petroleum) dates back to ancient geological periods, and its legacy will endure long beyond our time. Scientific publications and the media regularly report new locations where microplastics have infiltrated, including the air we breathe, tap water, packaged sea salt, bottled water, soil, earthworms, and the tissues of marine life across the food chain. Furthermore, ongoing research consistently uncovers additional, previously unknown risks linked to plastic pollution. This is the legacy of plastics. In: Farrelly, T.; *et. al.* (2021). *Ob. cit.*, p. 247.

all environmental compartments, where feasible, practical, and environmentally safe.

The CBD's Ocean Health Index³²⁵ – implemented under the Aichi Biodiversity Targets, more specifically Target 14³²⁶ –, which includes data on coastal chemical pollution and global marine plastic pollution^{327,328}, could provide a foundation for establishing global targets related to plastics³²⁹.

It should be noted, however, that under CBD specific measures for plastic waste are outlined in “soft law”, emphasising downstream solutions, without mentioning the chemicals used in plastics³³⁰.

- *Convention on the Conservation of Migratory Species of Wild Animals (CMS)*

The Convention on the Conservation of Migratory Species of Wild Animals (CMS or the Bonn Convention)³³¹ was adopted in 1979 and has numerous parties – 133 as of 1 March 2022³³².

In accordance with the Secretariat of the CMS, the legal mechanisms under the Bonn Convention “*may range from legally binding Agreements to less formal Memoranda of Understanding and can be adapted to fit the requirements of each region*”³³³. This is because the CMS acts as a framework Convention³³⁴.

Like the CBD, the CMS is also linked to the issue of plastic pollution in the ocean

³²⁵ Ocean Health Index (2024a). Ocean Health Index. Available at: <https://www.oceanhealthindex.org/>. Accessed on 29 November 2024.

³²⁶ By 2020, ecosystems that provide essential services, including services related to water, and contribute to health, livelihoods and well-being, are restored and safeguarded, taking into account the needs of women, indigenous and local communities, and the poor and vulnerable. In: UNEP (2016b). Generic and specific indicators for assessing progress in the attainment of the Aichi Biodiversity Targets, including an assessment of their main characteristics. Available at: <https://www.cbd.int/doc/strategic-plan/strategic-plan-indicators-en.pdf>. Accessed on 29 April 2023.

³²⁷ Decision XIII/28, Annex “Generic and specific indicators for assessing progress in the attainment of the Aichi Biodiversity Targets, including an assessment of their main characteristics”. In: UNEP (2016c). XIII/28. Indicators for the Strategic Plan for Biodiversity 2011-2020 and the Aichi Biodiversity Targets. Decision adopted by the Conference of the Parties to the Convention on Biological Diversity (CBD/COP/DEC/XIII/28). Available at: <https://www.cbd.int/doc/decisions/cop-13/cop-13-dec-28-en.pdf>. Accessed on 29 April 2023.

³²⁸ Ocean Health Index (2024b). Guidance: Clean Waters. Available at: <https://oceanhealthindex.org/guidance/clean-waters/>. Accessed on 29 November 2024.

³²⁹ BRS (2023). *Ob. cit.*, p. 71.

³³⁰ *Ibid.*, p. 37.

³³¹ CMS Secretariat (1979). **Convention on the Conservation of Migratory Species of Wild Animals**. Adopted in Bonn, 23 June 1979. Entered into force on 1 November 1983. Available at: https://www.cms.int/sites/default/files/instrument/CMS-text.en_.PDF. Accessed on 18 November 2022.

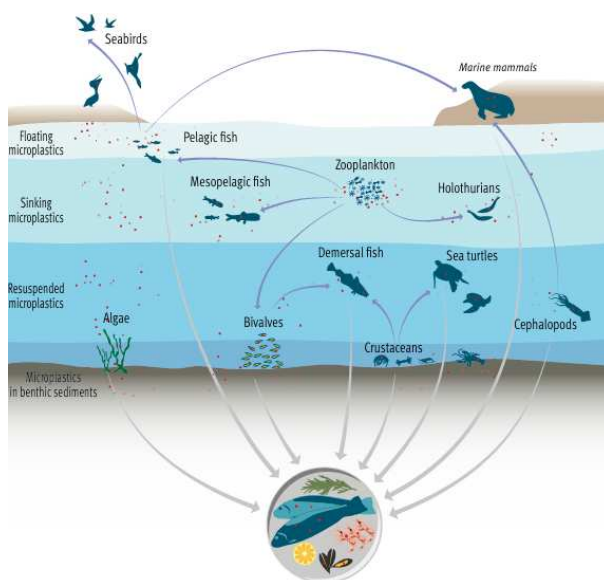
³³² CMS Secretariat (2024). Parties and Range States – Convention on the Conservation of Migratory Species of Wild Animals. Available at: <https://www.cms.int/en/parties-range-states>. Accessed on 16 November 2024.

³³³ UN (2024b). Secretariat of the Convention on the Conservation of Migratory Species of Wild Animals (UNEP/CMS). Available at: <https://unric.org/en/unep-cms/>. Accessed on 16 November 2024.

³³⁴ CMS Secretariat (2022). CMS – Convention on the Conservation of Migratory Species of Wild Animals. Available at: <https://www.cms.int/en/legalinstrument/cms>. Accessed on 16 November 2024.

as this form of pollution can harm wild animals. Plastics present significant risks of entanglement and ingestion for a wide variety of marine species (Fig. 8), including migratory ones – marine mammals, such as seals and sea turtles, often get entangled in ALDFG and other plastic debris³³⁵.

Figure 8 – Potential pathways of marine microplastics into our seafood³³⁶



Source: UNEP (2021a). Drowning in Plastics – Marine Litter and Plastic Waste Vital Graphics.

Besides, the number of plastics in the ocean has increased tenfold since 1980, resulting in the death of over one million seabirds and 100.000 marine mammals annually³³⁷.

Therefore, minimising and managing plastic waste is crucial for the conservation of these species “including many species of birds, turtles, sharks and marine mammals that are threatened with extinction”³³⁸. Specifically, addressing migratory species also involves addressing those in international waters, as noted in the preamble of the CMS

RECALLING Recommendation 32 of the Action Plan adopted by the United Nations Conference on the Human Environment (Stockholm, 1972) and noted

³³⁵ Ali, N.; *et. al.* (2024). *Ob. cit.*, p. 10.

³³⁶ UNEP (2021a). *Ob. cit.*, p. 35.

³³⁷ IOC-UNESCO (2020c). On World Oceans Day, UNESCO reinforces the importance of preserving the largest ecosystem on the planet. Available at: <https://www.unesco.org/en/articles/world-oceans-day-unesco-reinforces-importance-preserving-largest-ecosystem-planet#:~:text=Human%20actions%20have%20put%20marine,100%2C000%20marine%20mammals%20each%20year>. Accessed on 13 January 2024.

³³⁸ UNEP (2017d). Management Of Marine Debris. Convention on Migratory Species – adopted by the Conference of the Parties at its 12th Meeting (Manila, October 2017) (UNEP/CMS/Resolution 12.20). Available at: https://www.cms.int/sites/default/files/document/cms_cop12_res.12.20_marine_debris_e.pdf. Accessed on 15 April 2023.

with satisfaction at the Twenty-seventh Session of the General Assembly of the United Nations, (...) ³³⁹.

The recommendation mentioned is part of the Action Plan for the Human Environment, which was approved for inclusion in the report of the 1972 United Nations Conference on the Human Environment in Stockholm – the first global conference to prioritise the environment as a key issue. Among the recommendations present in the framework for environmental action, Recommendation 32 suggested that Governments

(...) give attention to the need to enact international conventions and treaties to protect species inhabiting international waters or those which migrate from one country to another:

(a) A broadly-based convention should be considered which would provide a framework by which criteria for game regulations could be agreed upon and the over-exploitation of resources curtailed by signatory countries;

(b) A working group should be set up as soon as possible by the appropriate authorities to consider these problems and to advise on the need for, and possible scope of, such conventions or treaties ³⁴⁰.

Moreover, the CMS text provides in Article III (4) that Range States ³⁴¹ shall endeavour

(a) to conserve and, where feasible and appropriate, restore those habitats of the species which are of importance in removing the species from danger of extinction;

b) to prevent, remove, compensate for or minimize, as appropriate, the adverse effects of activities or obstacles that seriously impede or prevent the migration of the species; and

c) to the extent feasible and appropriate, to prevent, reduce or control factors that are endangering or are likely to further endanger the species, including strictly controlling the introduction of, or controlling or eliminating, already introduced exotic species ³⁴².

These duties could reasonably apply to plastic pollution: nesting sites of migratory species may be covered in plastic, species may get entangled in plastic debris along their migration paths, and species may ingest plastic, leading to mortality within already vulnerable populations ³⁴³.

Furthermore, the COPs to the CMS have adopted many resolutions on managing

³³⁹ CMS, Preamble, Paragraph 7.

³⁴⁰ UN (1972a). **Report of the United Nations Conference on the Human Environment**. Chapter II. Action Plan for the Human Environment – “A. Framework for environmental action”. Available at: <https://documents.un.org/doc/undoc/gen/n17/300/05/pdf/n1730005.pdf>. Accessed on 17 August 2024.

³⁴¹ According to CMS, Article I (1) “h”, in relation to a particular migratory species, a Range State means “any State (and where appropriate any other Party referred to under sub-paragraph (k) of this paragraph) that exercises jurisdiction over any part of the range of that migratory species, or a State, flag vessels of which are engaged outside national jurisdictional limits in taking that migratory species;” (...).

³⁴² CMS, Article III (4).

³⁴³ Goodwin, E. (2024). *Ob. cit.*, p. 110.

marine debris, with the first one in 2011³⁴⁴. In 2014, significant progress was made, particularly during COP11 of the CMS, where a new resolution was adopted, and Parties highlighted the knowledge gaps regarding the impact of plastic pollution on migratory species

Recognizing that information on marine debris remains incomplete, especially regarding the quantity present in the ocean and entering the ocean annually, as well as its sources, pathways, prevalence in different sea compartments, and fate in terms of fragmentation, decomposition, distribution and accumulation; (...)³⁴⁵.

Through this Resolution, State Parties also encouraged the use of standardised methodologies in monitoring programs, and proposed considering

implementing cost-effective measures for the prevention of debris, such as levies on single-use carrier bags, deposit refund systems for beverage containers and obligations for the use of reusable items at events as appropriate to national circumstances; (...)³⁴⁶.

CMS Resolution 11.30 also urged Parties to address ALDFG and emphasised the importance of public awareness and education campaigns “*in order to achieve the behavioural change necessary for a significant reduction of marine debris*”³⁴⁷.

The CMS COP 11 saw a realignment of policy directions for the CMS and the development of a new Strategic Plan for Migratory Species for the years 2015-2023³⁴⁸. In fact, the contracting Parties to the CMS have achieved a certain level of consensus regarding the overall direction of their efforts through this Strategic Plan³⁴⁹.

In 2017, another resolution was adopted to follow up on new findings about plastic debris, its sources, pathways, and impacts. This resolution particularly focused on ghost gear and microplastics, calling on Parties to establish and implement policies and frameworks for waste management consistent with the CE concept and to cooperate on

³⁴⁴ UNEP; CMS (2011). Proceedings of the Tenth Meeting of the Conference of the Parties. Adoption of Resolutions, p. 49. Available at: https://www.cms.int/sites/default/files/publication/COP10_Proceedings_E_491_pages.pdf. Accessed on 16 August 2024.

³⁴⁵ Resolution 11.30, Preamble, Paragraph 7. In: UNEP (2014a). Management of Marine Debris. Adopted by the Conference of the Parties at its 11th Meeting (Quito, 4-9 November 2014) (UNEP/CMS/Resolution 11.30). Available at: https://www.cms.int/sites/default/files/document/Res_11_30_Management_Marine_Debris_E.pdf. Accessed on 12 November 2023.

³⁴⁶ Resolution 11.30, Paragraph 6.

³⁴⁷ Resolution 11.30, Preamble, Paragraph 15.

³⁴⁸ UNEP; CMS (2014). The Strategic Plan for Migratory Species 2015-2023. Available at: https://www.cms.int/sites/default/files/document/CMS_Sharks_MOS2_Inf_9.pdf. Accessed on 12 November 2023.

³⁴⁹ Goodwin, E. (2024). *Ob. cit.*, p. 110.

clean-up efforts. It also invited Parties to set quantitative targets related to marine debris and proposed a range of measures to be implemented in partnership with the private sector and civil society, such as deposit refund schemes, EPR, and the phase-out of disposable plastics and microplastics in various products³⁵⁰.

From a broader perspective, thus, the CMS regime is notable for its dynamic evolution since the adoption of the Bonn Convention, rather than for its substantive provisions. This progress includes a consistent increase in the number of Parties, listed species, and, crucially, subsidiary instruments³⁵¹.

When it comes to MPP, however, the CMS can only serve as a supplementary agreement in the broader efforts to address plastic pollution. Its scope is limited due to its focus on international migratory species, and its obligations are legally ambiguous, as States have only agreed to “endeavour” to implement the measures outlined in Article III (4)³⁵². Besides, resource constraints hinder the proper implementation of the Convention, particularly given the broad range of activities it encompasses – this is the primary reason why the CMS is often seen as ineffective³⁵³.

- *Convention on the Law of the Non-navigational Uses of International Watercourses (UNWC) and Convention on the Protection and Use of Transboundary Watercourses and International Lakes Water Convention (UNECE Water Convention)*

Given that the plastic pollution issue, particularly in the ocean, is a global challenge, solutions require a multifaceted approach with cooperation at all levels, including between States.

As analysed, international law offers a framework that facilitates State-to-State collaboration on matters of global concern, such as the law of the sea – but it does so as well with international watercourses³⁵⁴.

³⁵⁰ UNEP (2017c). Management of Marine Debris. Adopted by the Conference of the Parties at its 12th Meeting (Manila, October 2017) (UNEP/CMS/Resolution 12.20). Available at: https://www.cms.int/sites/default/files/document/cms_cop12_res.12.20_marine_debris_e.pdf. Accessed on 14 November 2023.

³⁵¹ Lewis, M.; Trouwborst, A. (2017). Bonn Convention on the Conservation of Migratory Species of Wild Animals 1979. In: **Elgar Encyclopedia of Environmental Law**. Cheltenham, UK: Edward Elgar Publishing, p. 33. DOI: <https://doi.org/10.4337/9781783477210.V.2>. Available at: https://www.elgaronline.com/display/book/9781785369520/b-9781783477210-V_2.xml. Accessed on 14 November 2023.

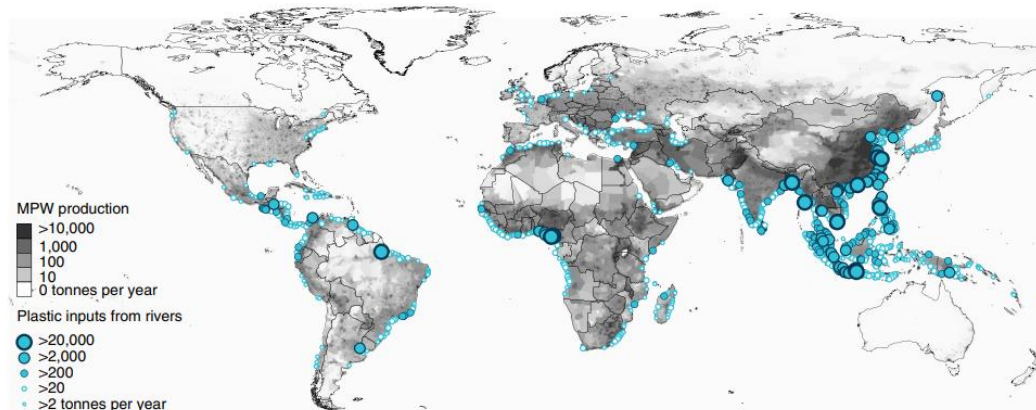
³⁵² Goodwin, E. (2024). *Ob. cit.*, p. 110.

³⁵³ Lewis, M.; Trouwborst, A. (2017). *Ob. cit.*, p. 33-34.

³⁵⁴ Krantzberg, G.; *et. al.* (2023). **Plastic Pollution** – Nature Based Solutions and Effective Governance. 1st Edition. CRC Press: Boca Raton, p. 6. ISBN 9781003137740. DOI:

The point where a watercourse meets the sea highlights a clear link between the environmental governance of international watercourses and the management of marine pollution³⁵⁵. Ten river systems are primarily responsible for transporting plastics into the ocean (Fig. 9), with eight of these located in Asia, and each flow, at least in part, through China's territory³⁵⁶.

Figure 9 – Mass of river plastic flowing into the ocean in tonnes per year³⁵⁷



Source: Lebreton, L.C.M.; *et. al.* (2017). River plastic emissions to the world's oceans. **Nature Communications**, vol. 8, p. 2.

When it comes to plastics entering the ocean from rivers, two key areas of international law are particularly relevant: the law of the sea, as codified in the UNCLOS, and the law of international watercourses, which is codified in two global water conventions: the UNECE Water Convention of 1992 and the UNWC of 1997³⁵⁸. They address the relationship between freshwater and marine environments, as well as the legal responsibilities of watercourse States in safeguarding the marine ecosystem³⁵⁹.

Although these agreements do not specifically address plastic pollution or the

<https://doi.org/10.1201/9781003137740>.

Available

at:

<https://www.taylorfrancis.com/books/edit/10.1201/9781003137740/plastic-pollution-gail-krantzberg-savitri-jetoo-velma-grover-sandhya-babel>. Accessed on 12 August 2024.

³⁵⁵ Finska, L.; Howden, J.G. (2018). Troubled waters – Where is the bridge? Confronting marine plastic pollution from international watercourses. **RECIEL - Review of European, Comparative & International Environmental Law**, vol. 27, n. 3, Special Issue: Plastics Regulation, p. 248. DOI: <https://doi.org/10.1111/reel.12257>. Available at: <https://onlinelibrary.wiley.com/doi/10.1111/reel.12257>. Accessed on 14 November 2023.

³⁵⁶ Krantzberg, G.; *et. al.* (2023). *Ob. cit.*, p. 6.

³⁵⁷ River contributions are based on specific watershed factors, including population density (people per km²), the production of mismanaged plastic waste (MPW) per country (in kg per person per day), and the monthly average runoff (in mm per day). Estimates show that between 1.15 and 2.41 million tonnes of plastic are currently flowing from the global river system into the oceans each year. In: Lebreton, L.C.M.; *et. al.* (2017). River plastic emissions to the world's oceans. **Nature Communications**, vol. 8, p. 2. Available at: <https://www.nature.com/articles/ncomms15611>. Accessed on 15 October 2023.

³⁵⁸ Krantzberg, G.; *et. al.* (2023). *Ob. cit.*, p. 191-192.

³⁵⁹ Finska, L.; Howden, J.G. (2018). *Ob. cit.*, p. 248.

marine environment, they provide foundational frameworks that can be further expanded and progressively developed by the parties involved³⁶⁰.

The UNECE Water Convention was adopted in Helsinki in 1992 and came into force in 1996 – it was later amended in 2013 to allow membership to all UN Member States³⁶¹. This legally binding instrument plays a unique role in promoting the sustainable management of shared water resources. It supports the implementation of the SDGs, aids in the prevention of conflicts, and fosters peace and regional integration³⁶².

The Convention emphasises environmental protection in its preamble, underscoring the need for

strengthened national and international measures to prevent, control and reduce the release of hazardous substances into the aquatic environment and to abate eutrophication and acidification, as well as pollution of the marine environment, in particular coastal areas, from land-based sources, (...) ³⁶³.

While the Convention does not explicitly target freshwater resources, its preamble highlights the strong connection between land-based pollution sources and marine pollution³⁶⁴.

Marine areas are not classified as “transboundary waters” under Article 1(1), but they are encompassed within the broader scope of the Convention, as outlined in Article 2(6)

The Riparian Parties shall cooperate on the basis of equality and reciprocity, in particular through bilateral and multilateral agreements, in order to develop harmonized policies, programmes and strategies covering the relevant catchment areas, or parts thereof, aimed at the prevention, control and reduction of transboundary impact and aimed at the protection of the environment of transboundary waters or the environment influenced by such waters, including the marine environment³⁶⁵.

This provision obligates member States to develop policies, programs, and strategies aimed at preventing, controlling, and reducing transboundary impacts,

³⁶⁰ Krantzberg, G.; *et. al.* (2023). *Ob. cit.*, p. 192.

³⁶¹ Finska, L.; Howden, J.G. (2018). *Ob. cit.*, p. 248.

³⁶² UNECE (2023). About the Water Convention. Available at: <https://unece.org/environment-policy/water/about-the-convention/introduction>. Accessed on 13 November 2024.

³⁶³ Convention on the Protection and Use of Transboundary Watercourses and International Lakes, Preamble, Paragraph 3. In: UNECE (2014). **Convention on the Protection and Use of Transboundary Watercourses and International Lakes** – as amended, along with decision VI/3 clarifying the accession procedure. Opened for signature in Helsinki on 17 March 1992. Entry into force on 6 October 1996. Available at: https://unece.org/DAM/env/water/publications/WAT_Text/ECE_MP.WAT_41.pdf. Accessed on 15 June 2023.

³⁶⁴ Finska, L.; Howden, J.G. (2018). *Ob. cit.*, p. 248.

³⁶⁵ Convention on the Protection and Use of Transboundary Watercourses and International Lakes, Article 2 (6).

including the protection of the marine environment influenced by such waters³⁶⁶.

The UNECE Water Convention establishes a clear cooperative duty towards coastal States under Article 9(4)

Joint bodies according to this Convention shall invite joint bodies, established by coastal States for the protection of the marine environment directly affected by transboundary impact, to cooperate in order to harmonize their work and to prevent, control and reduce the transboundary impact³⁶⁷.

This provision is vital because it integrates the protection of the marine environment within the Convention's framework.

To fully comply with the obligation to protect the marine environment, UNECE Water Convention Member States must collaborate with coastal States through joint institutions. This involves coordinating legal frameworks, exchanging information, and developing joint action plans³⁶⁸. This cooperative approach is essential for ensuring that the UNWC's Article 23, which emphasises the protection of the marine environment, is effectively implemented

Watercourse States shall, individually and, where appropriate, in cooperation with other States, take all measures with respect to an international watercourse that are necessary to protect and preserve the marine environment, including estuaries, taking into account generally accepted international rules and standards³⁶⁹.

This provision highlights the link between watercourses and the marine environment, underscoring the impact that pollution from watercourses can have on marine ecosystems³⁷⁰.

In turn, the UNWC was adopted by the UNGA in 1997, following a drafting process by the International Law Commission (ILC) – it is the result of twenty years' work by the ILC³⁷¹, a subsidiary organ of the UNGA whose objective is “the promotion

³⁶⁶ Finska, L.; Howden, J.G. (2018). *Ob. cit.*, p. 248.

³⁶⁷ Convention on the Protection and Use of Transboundary Watercourses and International Lakes, Article 9 (4).

³⁶⁸ Finska, L.; Howden, J.G. (2018). *Ob. cit.*, p. 248.

³⁶⁹ Convention on the Law of the Non-navigational Uses of International Watercourses, Article 23. In: UN (2014). **Convention on the Law of the Non-navigational Uses of International Watercourses**. Adopted by the General Assembly of the United Nations on 21 May 1997. Entered into force on 17 August 2014. See General Assembly resolution 51/229, annex, Official Records of the General Assembly, Fifty-first Session, Supplement No. 49 (A/51/49). Available at: https://legal.un.org/ilc/texts/instruments/english/conventions/8_3_1997.pdf. Accessed on 17 August 2024.

³⁷⁰ Finska, L.; Howden, J.G. (2018). *Ob. cit.*, p. 248.

³⁷¹ McCaffrey, S.C. (2019). **The Law of International Watercourses**. 3rd Edition. General Editor: Sir Franklin Berman KCMG QC. Oxford University Press: United Kingdom, p. 421. ISBN: 9780198736929.

of the progressive development of international law and its codification”³⁷².

The UNWC serves as a framework convention that both codifies customary principles of international water law and establishes more progressive rules. The Convention applies to the uses of international watercourses and their waters for purposes other than navigation, as well as to measures for the protection, preservation, and management of these watercourses³⁷³.

The UNWC defines pollution of an international watercourse as “*any detrimental alteration in the composition or quality of the waters of an international watercourse which results directly or indirectly from human conduct*”³⁷⁴. However, similar to UNCLOS, it does not specifically mention marine plastic litter or microplastics³⁷⁵.

Its primary focus is on the international watercourse, which “*means a system of surface waters and groundwaters constituting by virtue of their physical relationship a unitary whole and normally flowing into a common terminus*”³⁷⁶. While the definition of a watercourse includes its terminus, the Convention does not provide further clarification on the relationship between the watercourse and its terminus or what constitutes such a terminus³⁷⁷.

Moreover, in the commentary to the draft articles of the UNWC, the ILC emphasised that the UNWC provisions do not impose a direct obligation to protect the marine environment but rather a duty to manage the watercourse in a way that avoids causing harm to that environment

(1) Article 23 addresses the increasingly serious problem of pollution that is transported into the marine environment by international watercourses. While the impact of such pollution upon the marine environment, including estuaries, has been recognized only relatively recently, it is now dealt with, directly or indirectly, in a number of agreements. In particular, the obligation not to cause pollution damage to the marine environment from land-based sources is recognized both in the 1982 United Nations Convention on the Law of the Sea and in conventions concerning various regional seas.

(2) The obligation set forth in article 23 is not, however, to protect the marine environment, *per se*, but to take measures “with respect to an international watercourse” that are necessary to protect that environment. But the obligation of watercourse States under article 23 is separate from, and additional to, the obligations set forth in articles 20 to 22. Thus, a watercourse State could conceivably damage an estuary through pollution of an international watercourse without breaching its obligation not to cause significant harm to

³⁷² Statute of ILC, Article 1 (1). In: UN (1982b). **Statute of the International Law Commission** (UN Doc. A/CN.4/4/Rev.2). United Nations, New York. Available at: <https://documents.un.org/doc/undoc/gen/g03/808/67/img/g0380867.pdf>. Accessed on 17 October 2023.

³⁷³ Finska, L.; Howden, J.G. (2018). *Ob. cit.*, p. 248.

³⁷⁴ Convention on the Law of the Non-navigational Uses of International Watercourses, Article 21 (1).

³⁷⁵ Raubenheimer, K.; McIlgorm, A.; Oral, N. (2018). *Ob. cit.*, p. 212.

³⁷⁶ Convention on the Law of the Non-navigational Uses of International Watercourses, Article 2 (a).

³⁷⁷ Finska, L.; Howden, J.G. (2018). *Ob. cit.*, p. 248.

other watercourse States. Article 23 would require the former watercourse State to take the measures necessary to protect and preserve the estuary³⁷⁸.

A key issue that arises is how these provisions are being implemented, especially in light of the substantial amount of marine plastic pollution originating from international watercourses. Furthermore, questions about how compliance with this provision is monitored become particularly pertinent, given that some coastal States are not parties to the UNWC³⁷⁹.

In conclusion, both the UNWC and the UNECE Water Convention are based on two core principles: the principle of equitable and reasonable utilization, and the due diligence obligation to prevent significant harm. While these principles are fundamental to international water law, they offer limited guidance for managing land-based sources of pollution³⁸⁰.

It is evident that the two conventions share a similar scope, focusing on the protection and use of international freshwater resources, while recognising the direct impact these resources have on the marine environment³⁸¹. However, although both global water conventions are in force, they are not necessarily the most widely adopted³⁸².

China, a key riparian state on rivers that contribute significantly to plastic pollution, was one of three nations that opposed the adoption of the Watercourses Convention at the UNGA in 1997. States have been hesitant to embrace the norms set out by these conventions, a reluctance demonstrated by the 44 years it took from the initial study of the UNWC to its eventual ratification and entry into force. The Convention was first proposed for study by the ILC in 1970, a draft was voted on at the United Nations in 1997, and it took an additional 17 years before it came into force in 2014³⁸³.

Given that rivers are a major source of marine plastic pollution and that there will

³⁷⁸ UN (2005b). Draft articles on the law of the non-navigational uses of international watercourses and commentaries thereto and resolution on transboundary confined groundwater, 1994. Report of the International Law Commission on the work of its forty-sixth session, p. 124. Available at: https://legal.un.org/ilc/texts/instruments/english/commentaries/8_3_1994.pdf. Accessed on 12 May 2024.

³⁷⁹ Finska, L.; Howden, J.G. (2018). *Ob. cit.*, p. 248.

³⁸⁰ Krantzberg, G.; *et. al.* (2023). *Ob. cit.*, p. 194.

³⁸¹ Finska, L.; Howden, J.G. (2018). *Ob. cit.*, p. 248.

³⁸² The Convention on the Law of the Non-Navigational Uses of International Watercourses has 40 Parties, while the Convention on the Protection and Use of Transboundary Watercourses and International Lakes counts with 55 Parties. In: UN Treaty Collection (2024c). 5. Convention on the Protection and Use of Transboundary Watercourses and International Lakes. Helsinki, 17 March 1992 – Status. Available at: https://treaties.un.org/pages/viewdetails.aspx?src=treaty&mtdsg_no=xxvii-5&chapter=27&clang=en. Accessed on 12 December 2024; and UN Treaty Collection (2024a). 12. Convention on the Law of the Non-Navigational Uses of International Watercourses. New York, 21 May 1997 – Status. Available at: https://treaties.un.org/pages/viewdetails.aspx?src=treaty&mtdsg_no=xxvii-12&chapter=27&clang=en. Accessed on 12 December 2024.

³⁸³ McCaffrey, S.C. (2019). *Ob. cit.*, p. 421.

be considerable overlap between the norms of international water law and a future LBI to fight against (marine) plastic pollution, the process of developing, drafting, and finalising such a treaty may also take a long time³⁸⁴ – as it is discussed in more detail in the Part II of this thesis.

In addition to these binding agreements, there are several soft law instruments that can facilitate cooperation among states – and play an important role in overcoming significant gaps. Soft law refers to non-binding instruments that, while containing commitments made by States, are not legally enforceable and do not provide direct recourse through dispute settlement mechanisms.

³⁸⁴ Krantzberg, G.; *et. al.* (2023). *Ob. cit.*, p. 202.

2.1.1.2 Voluntary international agreements and standards

Currently, plastic as a transboundary pollutant is not covered by a single legally binding international instrument but is instead loosely addressed across various conventions, such as those discussed in the previous section. These instruments do little to prevent the issue from arising (for instance, none address plastic production rates).

Furthermore, compared to other areas of environmental regulation, there is a complete absence of mandatory timelines and binding targets for reducing plastic pollution. At best, these instruments focus on plastic waste dumped from vessels, which accounts for only a small fraction of the total plastic waste entering the ocean.

As a result, along with the binding legal agreements that address plastic pollution to some extent, there is a broad array of voluntary international initiatives aimed at reducing and eliminating plastic pollution. The international community has established various “soft law” instruments³⁸⁵ – or simply non-binding instruments –, strategies, and action plans to address plastic pollution.

This Subsection, thus, specifically examines the issue of plastic pollution through the lens of international environmental soft law instruments. Although non-binding, these voluntary agreements play a crucial role in supporting States, industry, and other non-governmental actors. They encourage the adoption of established standards and facilitate initiatives that promote a life cycle approach to plastic management.

The instruments that fall within the scope of the research and are therefore analysed below are the Global Programme of Action (GPA), the Honolulu Strategy, the FAO Code of Conduct, the initiatives of the Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection (GESAMP), the G20 Action Plan on Marine Litter, the discussions conducted within the World Trade Organization (WTO), and the Strategic Approach to International Chemicals Management (SAICM).

- *The Global Programme of Action (GPA)*

Acknowledging the failure to control land-based sources of marine pollution, the 1992 United Nations Conference on Environment and Development (UNCED) decided

³⁸⁵ Soft law refers to the rules, in general, that do not require mandatory compliance with what they provide, suggesting standards of conduct to be followed. They do not generate penalties for non-compliance, that is, they are not coercive. In: Diniz, A.C. (2017). *Os direitos das crianças no âmbito internacional: uma perspectiva Soft Law e Hard Law*. **Revista das Faculdades Integradas Vianna Júnior**, vol. 8, n. 2, p. 390. ISSN 2177 3726. Available at: http://www.egov.ufsc.br/portal/sites/default/files/247-texto_do_artigo-458-1-10-20171213.pdf. Accessed on 04 November 2021.

to prioritise this issue. Agenda 21³⁸⁶ called on the UNEP to convene a meeting on land-based sources as soon as possible and identified key actions for addressing these sources

Agenda 21 – Chapter 17 PROTECTION OF THE OCEANS, ALL KINDS OF SEAS, INCLUDING ENCLOSED AND SEMI-ENCLOSED SEAS, AND COASTAL AREAS AND THE PROTECTION, RATIONAL USE AND DEVELOPMENT OF THEIR LIVING RESOURCES (...)

The UNEP Governing Council is invited to convene, as soon as practicable, an intergovernmental meeting on protection of the marine environment from land-based activities³⁸⁷.

Besides, Agenda 21 recommended updating the 1985 Montreal Guidelines for the Protection of the Marine Environment against Pollution from Land-Based Sources, evaluating the effectiveness of regional agreements, and, where necessary, creating new regional agreements

In carrying out their commitment to deal with degradation of the marine environment from land-based activities, States should take action at the national level and, where appropriate, at the regional and subregional levels, in concert with action to implement programme area A, and should take account of the Montreal Guidelines for the Protection of the Marine Environment from Land-Based Sources.

17.25. To this end, States, with the support of the relevant international environmental, scientific, technical and financial organizations, should cooperate, *inter alia*, to: a. Consider updating, strengthening and extending the Montreal Guidelines, as appropriate³⁸⁸; (...).

In November 1995, an international conference on land-based sources of marine pollution was held in Washington, D.C., resulting in the creation of the GPA for the Protection of the Marine Environment from Land-Based Activities, with UNEP serving as the Secretariat. The GPA is the only global intergovernmental mechanism directly addressing the link between terrestrial, freshwater, coastal, and marine ecosystems. Its goal is to maintain efforts to prevent, reduce, control, and/or eliminate marine degradation from land-based activities³⁸⁹.

³⁸⁶ Agenda 21 is an extensive action plan designed for global, national, and local implementation by United Nations system organizations, governments, and major groups in all areas where human activities affect the environment. Agenda 21, along with the Rio Declaration on Environment and Development and the Statement of Principles for the Sustainable Management of Forests, were adopted by over 178 governments at the UNCED held in Rio de Janeiro, Brazil, from June 3 to 14, 1992. In: UNCED (2022). Agenda 21 – UN Sustainable Development Goals Knowledge Platform. Available at: <https://sustainabledevelopment.un.org/outcomedocuments/agenda21>. Accessed on 12 October 2023.

³⁸⁷ Agenda 21, Paragraph 17.26. In: UN (1992a). **Agenda 21**. United Nations Conference on Environment & Development Rio de Janeiro, Brazil, 3 to 14 June 1992. Available at: <https://sustainabledevelopment.un.org/content/documents/Agenda21.pdf>. Accessed on 15 January 2022.

³⁸⁸ Agenda 21, Paragraphs 17.24 and 17.25. (a).

³⁸⁹ UN (2018). 2. Global Programme of Action for the Protection of the Marine Environment from Land-based Activities. In: Book - Unit 5 - Land-Based Sources of Marine Pollution. Available at:

The GPA aims at

preventing the degradation of the marine environment from land-based activities by facilitating the realization of the duty of States to preserve and protect the marine environment. It is designed to assist States in taking actions individually or jointly within their respective policies, priorities and resources, which will lead to the prevention, reduction, control and/or elimination of the degradation of the marine environment, as well as to its recovery from the impacts of land-based activities³⁹⁰.

This is already a notable advantage of the document from a plastic pollution perspective, as most of the plastic pollution originates from land-based sources³⁹¹. Moreover, while the GPA broadly addresses various forms of marine degradation, it also highlights specific concerns related to plastics. For instance, the GPA website displays mobile applications that target plastic pollution, such as the “*Beat the Microbead*”^{392,393}.

Importantly, the GPA highlights specific sources of land-based pollution for international cooperation, such as wastewater treatment, POPs, sewage, sediments, and litter, offering recommended approaches for each category – plastic is specifically mentioned in both the sewage and litter categories:

While international action has been taken to prevent the discharge of plastics and other persistent wastes from vessels, it has been estimated that approximately 80 per cent of persistent wastes originate from land. (...) Uncontrolled burning of litter containing plastics may generate significant quantities of POPs, metals and hydrocarbons which can reach the marine and coastal environment³⁹⁴.

<https://globalpact.informea.org/sites/default/files/documents/Book%20-%20Unit%205%20-%20Land-Based%20Sources%20of%20Marine%20Pollution.pdf>. Accessed on 17 January 2024.

³⁹⁰ UNEP (1995b). Global Programme of Action for the Protection of the Marine Environment from land-based activities. Intergovernmental Conference to adopt a Global Programme of Action for the protection of the marine environment from land-based activities. Washington, D.C., 23 October - 3 November 1995 (UNEP(OCA)/LBA/IG.2/7). Available at: <https://resolutions.unep.org/uploads/1995-gpa.pdf>. Accessed on 18 January 2024.

³⁹¹ Most marine plastic pollution comes from land-based sources: approximately 80% of the estimated 4.8-12.7 million metric tons of plastics entering the ocean annually originate from land. In: Guggisberg, S. (2024). *Ob. cit.*, p. 2.

³⁹² UNEP (2017b). Global Programme of Action for the Protection of the Marine Environment from Land-Based Activities. Available at: <https://www.unep.org/resources/toolkits-manuals-and-guides/global-programme-action-protection-marine-environment-land>. Accessed on 21 April 2024.

³⁹³ The mobile application “Beat the Microbead” was launched in 2013 at a UNEP convention in Jamaica. The app was initially designed to create a database of cosmetic and personal care products, helping to identify which ones contain microbeads and which ingredients are most commonly used. Its goal is to raise consumer awareness and provide a platform that highlights the scale of the microplastics issue, making it easier for people to understand and address. In: Plastic Soup Foundation (2024). *Beat the Microbead App*. Available at: <https://www.beatthemicrobead.org/impact/tools/>. Accessed on 13 November 2024.

³⁹⁴ GPA, Paragraphs 142 and 143. In: UNEP (2021c). Global Programme of Action for the Protection of the Marine Environment from Land-Based Activities (UNEP/GPA/ IGR.5/INF/6). Available at: <https://drive.google.com/file/d/10q52bibBaTeqKEUSpx0-L94Gc5YJjKEt/view>. Accessed on 15 August 2024.

However, a significant issue is the lack of a system to monitor the progress of these programs or to ensure their development and implementation by States³⁹⁵.

Countries and regions develop national and regional programs of action to implement the GPA. Every five years, Intergovernmental Review Meetings (IGRs) are held to assess the progress made by countries in implementing the GPA through their National Action Plans and to offer guidance for future actions³⁹⁶.

The first IGR focused on assessing the progress of GPA implementation to set realistic targets, activities, and responsibilities, while also developing feasible financial, institutional, and technological frameworks. The delegates discussed: (i) a review of GPA implementation from 1995 to 2001; (ii) the GPA's Strategic Action Plan on Municipal wastewater; (iii) the work program for the GPA Coordination Office for 2002-2006; and coastal and ocean governance³⁹⁷.

The delegates also

adopted the Montreal Declaration on the Protection of the Marine Environment from Land-based Activities, in which they commit to improving and accelerating implementation of the GPA through actions related to mainstreaming of the GPA, oceans and coastal governance, and financing of the GPA³⁹⁸.

The second IGR concentrated on strengthening the implementation of the GPA at national, regional and global levels; promoting the successful achievement of specific targets of the Johannesburg Plan of Implementation³⁹⁹, as they associate to the GPA, the ecosystems approach, and sanitation; and offering guidance on the UNEP/GPA Coordination Office's work programme for the 2007-2011 period.

³⁹⁵ Nagtzaam, G.; *et. al.* (2023). *Ob. cit.*, p. 213.

³⁹⁶ UNEP (2022c). Fifth Intergovernmental Review Meeting on the Implementation of the Global Programme of Action (GPA). Available at: <https://www.unep.org/events/unep-event/fifth-intergovernmental-review-meeting-implementation-global-programme-action-gpa#:~:text=The%20GPA%20Intergovernmental%20Review%20Meeting,hosts%20the%20GPA%20Coordination%20Office>. Accessed on 13 April 2024.

³⁹⁷ UNEP (2001). First intergovernmental review meeting on the implementation of the GPA. Available at: [https://www.unep.org/explore-topics/oceans-seas/what-we-do/addressing-land-based-pollution/governing-global-programme-5#:~:text=The%20First%20Intergovernmental%20Review%20\(IGR,30%20November%20in%20Montreal%20Canada](https://www.unep.org/explore-topics/oceans-seas/what-we-do/addressing-land-based-pollution/governing-global-programme-5#:~:text=The%20First%20Intergovernmental%20Review%20(IGR,30%20November%20in%20Montreal%20Canada). Accessed on 13 April 2024.

³⁹⁸ Borgese, E.M.; Chircop, A.; McConnell, M.L. (2003). Montreal Declaration on the Protection of the Marine Environment from Land-Based Activities. In: **Ocean Yearbook**, vol. 17, n. 1. University of Chicago Press. DOI: <https://doi.org/10.1163/221160003X00339>. Available at: <https://brill.com/view/journals/ocyo/17/1/article-p962.xml>. Accessed on 15 February 2024.

³⁹⁹ The Johannesburg Plan of Implementation is an action plan developed by the UN. It emerged as the outcome of the World Summit on Sustainable Development held in Johannesburg in 2002. In: UNEP (2003). Plan of Implementation of the World Summit on Sustainable Development. Available at: https://www.un.org/esa/sustdev/documents/WSSD_POI_PD/English/WSSD_PlanImpl.pdf. Accessed on 17 October 2023.

The major outcomes of IGR-2 included a comprehensive review of achievements from 2001 to 2006, the development of guidance for the period 2007-2011, and the establishment of 19 partnerships to mainstream the GPA's implementation. Additionally, the Beijing Declaration on Furthering the Implementation of the GPA was adopted⁴⁰⁰.

Preceding IGR-2, the first Global Conference on Land-Ocean Connections (GLOC), which gathered scientists, experts, policymakers, and NGOs, made recommendations that informed the third IGR⁴⁰¹.

The objectives of IGR-3 were: (i) to assess the implementation of the GPA Coordination Office's Work Programme for 2007-2011 and define its future direction; (ii) to identify, discuss, and develop recommendations for emerging issues regarding the protection of the marine environment from land-based activities; and (iii) to prepare government input for the Rio+20 process. The delegates successfully met these objectives through the release of reports and declarations⁴⁰².

At IGR-3, 64 governments and the European Commission proposed the creation of the Global Partnership on Marine Litter (GPML)⁴⁰³, as outlined in the Manila Declaration on Advancing the Implementation of the Global Programme of Action for the Protection of the Marine Environment from Land-based Activities:

Working with all stakeholders concerned to find innovative solutions and initiatives to the problem of marine litter, including by sharing best practices, technical information about capacity-building and legal, policy, community-based, economic and market-based means of preventing, reducing and managing marine litter, and working to establish a global partnership on marine litter; (...) ⁴⁰⁴.

⁴⁰⁰ UNEP (2006). Second Intergovernmental Review Meeting on the Implementation of the GPA. Available at: <https://www.unep.org/explore-topics/oceans-seas/what-we-do/addressing-land-based-pollution/governing-global-programme-4>. Accessed on 17 October 2023.

⁴⁰¹ UNEP (2012a). First global conference on land-ocean connections. Available at: <https://www.unep.org/explore-topics/oceans-seas/what-we-do/addressing-land-based-pollution/governing-global-programme-3#:~:text=The%20Global%20Conference%20on%20Land,Marine%20Environment%20from%20Land%20Based>. Accessed on 22 October 2023.

⁴⁰² UNEP (2012c). Third intergovernmental review meeting on the implementation of the GPA. Available at: <https://www.unep.org/explore-topics/oceans-seas/what-we-do/addressing-land-based-pollution/governing-global-programme-0>. Accessed on 22 October 2023.

⁴⁰³ As of October 2022, however, the GPML officially rebranded as the "Global Partnership on Plastic Pollution and Marine Litter", reflecting its expanded focus that encompasses prevention and reduction strategies throughout the entire lifecycle of plastics. In: UNEP (2022d). Outcome Report UNEP/EA.4/RES.6 Marine Plastic Litter and Microplastics. Reporting Period Dec-2022. Available at: <https://open.unep.org/resolution/outcome-report/339>. Accessed on 19 December 2024.

⁴⁰⁴ Manila Declaration on Advancing the Implementation of the Global Programme of Action for the Protection of the Marine Environment from Land-based Activities, Paragraph 5 (b). In: UNEP (2012b). **Manila Declaration on Furthering the Implementation of the Global Programme of Action for the Protection of the Marine Environment from Land-based Activities**. Twelfth special session of the Governing Council/ Global Ministerial Environment Forum Nairobi, 20–22 February 2012 (UNEP/GCSS.XII/INF/10). Available at: https://resolutions.unep.org/uploads/2012-manila_declaration-implementation_of_gpa.pdf. Accessed on 23 November 2023.

Officially launched at “Rio+20”⁴⁰⁵, the GPML is a global, multi-stakeholder partnership that unites international agencies, governments, NGOs, academia, the private sector, civil society, and individuals with the shared goal of reducing and better managing marine litter⁴⁰⁶. The GPML has been established to tackle the global challenge posed by marine litter, including plastics, by engaging all public and private sector stakeholders throughout the entire lifecycle of plastics and encouraging collaborative solutions across all sectors⁴⁰⁷.

Central to the GPML is the implementation of the Honolulu Strategy, which is analysed below. Furthermore, it is worth highlighting that several initiatives and cooperation processes, including the GPML, provide a solid foundation for establishing a future global governance framework for dealing with plastic pollution⁴⁰⁸.

In 2017, the UNEP launched the “Clean Seas Campaign” to support the goals of the GPML⁴⁰⁹. It provides a platform for connecting and mobilising governments, industry, civil society organisations, and individuals to drive meaningful change. The Campaign calls for a global shift in habits, practices, standards, and policies to significantly reduce marine litter and its harmful effects. Since its creation, over 62 countries have joined, making it the largest and most influential global coalition committed to eradicating marine plastic pollution⁴¹⁰.

Under the Clean Seas Campaign, States have committed to establishing marine reserves and implementing domestic plans for recycling and waste management –for instance, Indonesia has pledged to reduce plastic waste by 70% by 2030, while Kenya, Jordan, Madagascar, Chile, and France have either banned or committed to banning single-use or non-biodegradable plastic bags. The Campaign tracks State commitments while striving to encourage more countries to adopt similar actions. It also engages the private sector, which is recognised as essential to the success of any initiative, in efforts to influence consumer behaviour and improve product design⁴¹¹.

⁴⁰⁵ The United Nations Conference on Sustainable Development, held in Rio de Janeiro, Brazil on 20-22 June 2012.

⁴⁰⁶ UNEP; GPA (2016). Global Partnership on Marine Litter. Available at: <https://www.sprep.org/attachments/VirLib/Global/partnership-marine-litter.pdf>. Accessed on 18 September 2023.

⁴⁰⁷ Manyara, P.; Raubenheimer, K.; Sadan, Z. (2022). *Ob. cit.*, p. 157.

⁴⁰⁸ UNEP (2021b). *Ob. cit.*, p. 87.

⁴⁰⁹ GPML (2022). Clean Seas Campaign. Available at: <https://www.gpmarinelitter.org/what-we-do/clean-seas-campaign>. Accessed on 13 August 2024.

⁴¹⁰ Manyara, P.; Raubenheimer, K.; Sadan, Z. (2022). *Ob. cit.*, p. 161.

⁴¹¹ Nagtzaam, G.; *et. al.* (2023). *Ob. cit.*, p. 216.

Subsequently, in 2018, the IGR-4 focused on several key topics: (i) strategic directions for the GPA in tackling marine pollution and supporting commitments from governments and other stakeholders; (ii) options for developing a targeted global approach to combat marine litter; (iii) innovative financing approaches for investments in wastewater treatment, particularly in developing countries; (iv) the consideration of norms and standard-setting involving relevant private sector interests in addressing nutrient pollution; (v) exploring options for diversifying the GPA's funding; and (vi) strengthening cooperation with the Regional Seas Programmes to address marine pollution originating from land-based sources⁴¹².

On that occasion, the Bali Declaration on the Protection of the Marine Environment from Land-based Activities was also adopted⁴¹³, a document where the representatives of 60 Governments and the European Union agreed to continue to work on

Enhancing the mainstreaming of the protection of coastal and marine ecosystems, especially from the environmental threats caused by increased nutrients, wastewater, and marine litter and microplastics; (...)
 (...) efforts relating to the three pollution streams – nutrients, wastewater and marine litter and microplastics from land-based sources – in support of the 2030 Agenda for Sustainable Development as a framework for sustainable development; (...)
 (...) efforts to combat pollution from nutrients, wastewater, and marine litter and microplastics from land-based sources in an integrated manner, and the inclusion of the land/sea and freshwater/seawater interfaces in action plans for addressing marine litter, wastewater and nutrients; (...) ⁴¹⁴.

Finally, the IGR-5 occurred in 2022 and worked on reviewing the implementation of the GPA at the international, regional and national levels during the period 2019–

⁴¹² UNEP (2018c). Fourth Intergovernmental Meeting of the Global Programme of Action. Working Group Meeting, 31 October - 1 November 2018 in Bali, Indonesia. Available at: <https://www.unep.org/cep/events/working-group-meeting/fourth-intergovernmental-meeting-global-programme-action>. Accessed on 17 September 2023.

⁴¹³ UNEP (2019c). Report of the fourth session of the Intergovernmental Review Meeting on the Implementation of the Global Programme of Action for the Protection of the Marine Environment from Land-based Activities. UNEP/GPA/IGR.4/5. Available at: <https://documents.un.org/doc/undoc/gen/k19/006/79/pdf/k1900679.pdf>. Accessed on 18 September 2023.

⁴¹⁴ Bali Declaration, Paragraphs 1 and 2. In: UNEP (2019a). **Bali Declaration**. Intergovernmental Review Meeting on the Implementation of the Global Programme of Action for the Protection of the Marine Environment from Land-based Activities Fourth session Bali, Indonesia, 31 October–1 November 2018 (UNEP/GPA/IGR.4/6). Available at: <https://apps1.unep.org/igr-meeting/sites/default/files/k1900652.pdf>. Accessed on 17 September 2023.

2021⁴¹⁵, stressing that the GPA “*has been providing meaningful contributions over the years to overcome policy fragmentation*”⁴¹⁶.

In conclusion, the GPA has made significant progress, including in areas related to plastics. One notable example is the publication “Valuing Plastics”, which highlights key advancements in addressing plastic pollution, such as how much they cost in environmental damage to marine ecosystems – approximately USD13 billion per year. This includes the financial losses faced by fisheries and tourism, as well as the time and resources spent on cleaning up beaches. Besides,

The total natural capital cost of plastic used in the consumer goods industry is estimated to be more than USD75 billion per year. The cost comes from a range of environmental impacts including those on oceans and the loss of valuable resources when plastic waste is sent to landfill rather than being recycled. The most significant upstream impact is greenhouse gas emissions released from producing plastic feedstock, which is responsible for almost a third of the total natural capital costs⁴¹⁷.

Additionally, the GPA led to the Resolution 1/6 of the United Nations Environment Assembly (UNEA), entitled “Marine plastic debris and microplastics”, which calls for a comprehensive study⁴¹⁸ covering various aspects of plastic pollution

(...) the United Nations Environment Programme (UNEP) and the Global Programme of Action for the Protection of the Marine Environment from Land-Based Activities, through the Global Partnership on Marine Litter, were mandated to undertake a study on marine plastic debris and marine microplastics, building on existing work and taking into account the most up-to-date studies and data, focusing on identification of the key sources of marine plastic debris and microplastics; identification of possible measures and best available techniques and environmental practices to prevent the accumulation and minimize the level of microplastics in the marine environment; recommendations for the most urgent actions; specification of areas especially

⁴¹⁵ UNEP (2021f). Provisional agenda (UNEP/GPA/IGR.5/1). Available at: <https://wedocs.unep.org/bitstream/handle/20.500.11822/37740/UNEP-GPA-IGR-5-1.pdf?sequence=3&isAllowed=y>. Accessed on 18 September 2023.

⁴¹⁶ UNEP (2021e). Progress in the implementation of the Global Programme of Action for the Protection of the Marine Environment from Land-based Activities at the international, regional and national levels during the period 2019–2021 (UNEP/GPA/IGR.5/2 E). Available at: <https://uneplivemapservices.unep.org/bitstream/handle/20.500.11822/37817/UNEP-GPA-IGR.5-2.pdf?sequence=3&isAllowed=y>. Accessed on 18 September 2023.

⁴¹⁷ UNEP (2014c). **Valuing Plastics: The Business Case for Measuring, Managing and Disclosing Plastic Use in the Consumer Goods Industry**. This publication is a contribution to the Global Partnership on Marine Litter (GPML), p. 7. Available at: https://assets.eu.ctfassets.net/jchk06tdml2i/8640970377f042989e07186781195a0d/bb3258b0f82b92dd48dd1a58539ba0e1/UNEP_Plastic.pdf. Accessed on 21 October 2023.

⁴¹⁸ The study, published in 2016, is entitled “Marine Plastic Debris and Microplastics – Global Lessons and Research to Inspire Action and Guide Policy Change”. In: UNEP (2016d). **Marine plastic debris and microplastics** – Global lessons and research to inspire action and guide policy change. United Nations Environment Programme, Nairobi. Available at: <https://www.unep.org/resources/publication/marine-plastic-debris-and-microplastics-global-lessons-and-research-inspire>. Accessed on 30 November 2023.

in need of more research, including with regard to key impacts on the environment and on human health; and any other relevant priority areas (...) ⁴¹⁹.

A general evaluation of the GPA reveals its continued importance due to the substantial contribution of land-based sources to marine pollution. Despite its importance, several challenges hinder the successful implementation of the GPA. Key issues include the lack of interest from States, its non-binding nature, the absence of compliance mechanisms, and insufficient support for developing countries ⁴²⁰.

- *Honolulu Strategy: A Global Framework for Prevention and Management of Marine debris*

In 2012, UNEP launched the “Honolulu Strategy: A Global Framework for the Prevention and Management of Marine Debris” to aid in the implementation of the GPA through a set of goals and strategies ⁴²¹.

It follows the fifth International Marine Debris Conference (5IMDC), held in Honolulu in 2011, which concluded with the Honolulu Commitment. This commitment called on governments, NGOs, industry, and other stakeholders to pledge their support for 12 action points, including the formulation of the Honolulu Strategy to prevent, reduce, and manage marine debris. This framework, sponsored by the UNEP and the National Oceanic and Atmospheric Administration (NOAA), was released in 2012 ⁴²².

The 5IMDC also concluded that, although addressing marine debris presents significant challenges, the issue is preventable. The summary proceedings, published online after the event, included reports from three working groups focused on the prevention, reduction, and management of land-based sources, at-sea sources, and the removal and processing of accumulated marine debris. These reports highlighted progress

⁴¹⁹ UNEP (2016e). **Resolution 1/6: Marine plastic debris and microplastics**. United Nations Environment Assembly of the United Nations Environment Programme Second session Nairobi, 23–27 May 2016 (UNEP/EA.2/5), p. 2. Available at: https://digitallibrary.un.org/record/3967653/files/UNEP_EA.2_5-EN.pdf?ln=en. Accessed on 29 November 2023.

⁴²⁰ Meier-Wehren, B. (2013). The Global Programme of Action for the Protection of the Marine Environment from Land-based Activities. **New Zealand Journal of Environmental Law**, vol. 2, n. 17, p. 36-40. Available at: <https://www.nzlii.org/nz/journals/NZJEnvLaw/2013/2.html>. Accessed on 12 December 2023.

⁴²¹ Jung, D. (2023). *Ob. cit.*, p. 48.

⁴²² Ryan, P.G. (2015). A Brief History of Marine Litter Research. In: **Marine Anthropogenic Litter**. Editors Bergmann, M., Gutow, L., Klages, M. Springer, Cham, p. 14. DOI: https://doi.org/10.1007/978-3-319-16510-3_1. Available at: https://link.springer.com/chapter/10.1007/978-3-319-16510-3_1. Accessed on 17 January 2024.

made in each area over the past decade, identified remaining challenges, and proposed recommendations for future action⁴²³.

Thus, the Honolulu Strategy serves as a framework for a global initiative aimed at reducing the ecological, human health, and economic impacts of marine debris⁴²⁴. It is intended to function as a planning tool, a reference framework, and a means of tracking progress across various programs – it does not replace or override the efforts of national authorities, municipalities, industries, international organisations, or other stakeholders; instead, it serves as a central point for enhancing collaboration and coordination among the diverse stakeholders worldwide who are concerned with marine debris⁴²⁵.

The Honolulu Strategy outlines three main goals aimed at reducing the threats posed by marine debris:

Goal A: Reduced amount and impact of land-based litter and solid waste introduced into the marine environment

Goal B: Reduced amount and impact of sea-based sources of marine debris including solid waste, lost cargo, ALDFG, and abandoned vessels introduced into the sea

Goal C: Reduced amount and impact of accumulated marine debris on shorelines, in benthic habitats, and in pelagic waters⁴²⁶.

These three goals are supported by a series of strategies and potential actions. For instance, efforts to standardise data collection methods and protocols are being advanced by various organisations, including UNEP, which has developed its Guidelines on Survey and Monitoring of Marine Litter. These guidelines offer standardised operational instructions for monitoring programs and marine litter surveys⁴²⁷.

The Honolulu Strategy, thus, is considered an important advance in soft law on the subject⁴²⁸. It, however, does not set specific targets or actions for marine debris

⁴²³ Carswell, B.; McElwee, K.; Morison, S. (2011). **Technical Proceedings of the Fifth International Marine Debris Conference**. March 20–25, 2011. NOAA Technical Memorandum NOS-OR&R-38. Honolulu, Hawaii, USA. Available at: <https://marinedebris.noaa.gov/other-reports/technical-proceedings-fifth-international-marine-debris-conference>. Accessed on 14 December 2023.

⁴²⁴ Manyara, P.; Raubenheimer, K.; Sadan, Z. (2022). *Ob. cit.*, p. 160.

⁴²⁵ NOAA; UNEP (2012). **The Honolulu Strategy** – A Global Framework for Prevention and Management of Marine Debris, p. ES-1. Available at: <https://wedocs.unep.org/bitstream/handle/20.500.11822/10670/Honolulu%20strategy.pdf?sequence=1&isAllowed=y>. Accessed on 13 February 2024.

⁴²⁶ *Ibid.*, p. 2.

⁴²⁷ Cheshire, A.C.; *et. al.* (2009). UNEP/IOC Guidelines on Survey and Monitoring of Marine Litter. UNEP Regional Seas Reports and Studies, No. 186; IOC Technical Series No. 83: xii + 120 pp. Available at:

<https://wedocs.unep.org/bitstream/handle/20.500.11822/13604/rsrs186.pdf?sequence=1&isAllowed=y>. Accessed on 15 February 2024.

⁴²⁸ Stoett, P.J.; Mulligan, S. (2019). Governance gaps and Green Goals. In: **Global Ecopolitics** – Crisis, Governance, and Justice. 2nd Edition, University of Toronto Press: Canada, p. 181-182. ISBN 9781487587901.

reduction, as these will vary based on the social, cultural, environmental, and economic contexts in which they are developed and implemented⁴²⁹.

In addition, the Honolulu Strategy depends on plastics being classified as harmful to humans or marine life. This creates gaps that allow plastic producers to avoid full responsibility for the entire lifecycle of their plastic products.

In conclusion, as analysed, in 2012, to aid in the implementation of the Honolulu Strategy, States negotiated the creation of the GPML. Subsequently, in 2017, to support the GPML, the UNEP also launched the Clean Seas Campaign to raise awareness and foster dialogue. UNEP is also conducting research on marine plastic pollution and supporting the achievement of the Sustainable Development Goal 14 of the 2030 Agenda – which will be discussed in detail shortly.

Despite these international regulations and coordination efforts, global governance of marine plastic pollution remains highly fragmented, with substantial differences in policies, waste management infrastructure, and industry practices across various jurisdictions.

The effectiveness of “bottom-up” governance weakens significantly as industry interests grow, partly because the fragmentation of authority provides numerous opportunities for industries to exploit gaps, evade accountability, and limit the scope of reforms. *Ad hoc*, bottom-up governance has only led to meaningful progress in global management in rare instances where transnational activism is strong, governments in leading markets impose strict regulations, industry costs are minimal, first movers gain competitive advantages, and overall resistance from the industry is low – as demonstrated by the phase-out of microbeads⁴³⁰.

- *Food and Agriculture Organization (FAO) Code of Conduct for Responsible Fisheries*

Although the exact quantity of abandoned, lost, or discarded fishing gear entering the ocean remains uncertain, it is widely acknowledged as the most detrimental form of marine plastic litter. Whether intentionally discarded or accidentally lost, ALDFG poses significant threats to vulnerable species, damages fragile habitats, creates navigational

⁴²⁹ NOAA; UNEP (2012). *Ob. cit.*, p. 3.

⁴³⁰ Dauvergne, P. (2018). *Ob. cit.*, p. 25.

hazards, and depletes fish stocks. Additionally, if not properly managed, ALDFG can jeopardise food security, livelihoods, and human health⁴³¹.

Fishing gear is likely the most challenging source of marine pollution to eliminate, as there are still no suitable alternatives, and the demands are so significant that some losses are unavoidable. ALDFG is estimated to account for around 10% of current marine debris, meaning that addressing other sources could reduce approximately 90% of plastic flows into the ocean (though it would not eliminate the debris already accumulated). This does not mean, however, that 90% of the problems caused by MPP would be solved, as fishing gear, along with balloons and plastic bags, are regarded as the most harmful types of waste to marine life⁴³².

The 1995 FAO Code of Conduct for Responsible Fisheries is a voluntary framework that sets standards of good practice for all individuals and entities involved in fisheries and aquaculture. It recommends the adoption of measures to protect marine habitats from pollution, recommending that

All critical fisheries habitats in marine and fresh water ecosystems, such as wetlands, mangroves, reefs, lagoons, nursery and spawning areas, should be protected and rehabilitated as far as possible and where necessary. Particular effort should be made to protect such habitats from destruction, degradation, pollution and other significant impacts resulting from human activities that threaten the health and viability of the fishery resources⁴³³.

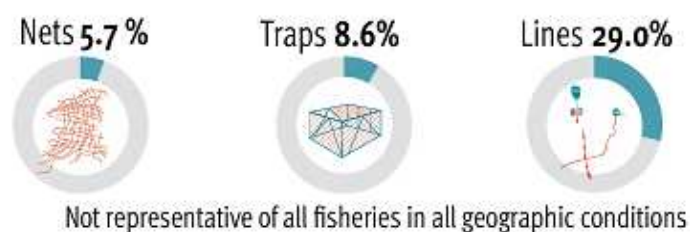
Fisheries and marine plastic pollution are interconnected in a two-way relationship, as plastic pollution impacts marine life while fisheries also contribute to plastic pollution – since plastics are the primary material used in fishing gear⁴³⁴.

⁴³¹ Giskes, I.; *et al.* (2022). **Report on good practices to prevent and reduce marine plastic litter from fishing activities**. Rome and London, FAO and IMO. DOI: <https://doi.org/10.4060/cb8665en>. Available at: <https://openknowledge.fao.org/server/api/core/bitstreams/ddb38772-d471-48d1-84ae-0cf08119acb6/content>. Accessed on 17 March 2024.

⁴³² Clift, R.; *et al.* (2019). Managing Plastics: Uses, Losses and Disposal. **Law Environment and Development Journal**, vol. 15/2, p. 104. Article - Special issue on designing law and policy towards managing plastics in a circular economy. Available at: <https://eprints.soas.ac.uk/33067/1/19093.pdf>. Accessed on 06 June 2023.

⁴³³ FAO Code of Conduct, Article 6 “General Principles” (6.8). In: FAO (1995). **Code of Conduct for Responsible Fisheries**. Available at: <https://openknowledge.fao.org/server/api/core/bitstreams/23312a48-cb99-4abf-b7e9-4f2f38604695/content>. Accessed on 17 April 2024.

⁴³⁴ Apete, L.; Martin, O.V.; Iacovidou, E. (2024). Fishing plastic waste: Knowns and known unknowns. **Marine Pollution Bulletin**, vol. 205. DOI: <https://doi.org/10.1016/j.marpolbul.2024.116530>. Available at: <https://www.sciencedirect.com/science/article/pii/S0025326X24005071#bb5070>. Accessed on 19 April 2024.

Figure 10 – Fishing gear lost in the ocean in 2017⁴³⁵

Source: UNEP (2021a). Drowning in Plastics – Marine Litter and Plastic Waste Vital Graphics.

It is estimated that each year, global fishing gear losses account for 5.7% of all fishing nets, 8.6% of all traps, and 29% of all lines used (Fig. 10). ALDFG, consequently, can significantly impact marine organisms through entanglement and ingestion⁴³⁶.

Although the Code itself is not legally binding, some provisions are grounded in international law and may become binding through other legal instruments among the countries that are parties. For instance, it could effectively become binding through the application of UNCLOS, which references “internationally agreed rules” in its article 207⁴³⁷.

The FAO Code of Conduct is a voluntary document created in response to growing concerns among States about how to responsibly manage fisheries within their Exclusive Economic Zones (EEZs) – which embrace around 90 percent of the world’s marine fisheries⁴³⁸. According to UNCLOS, the EEZs fall under the jurisdiction of States

The exclusive economic zone is an area beyond and adjacent to the territorial sea, subject to the specific legal regime established in this Part, under which the rights and jurisdiction of the coastal State and the rights and freedoms of other States are governed by the relevant provisions of this Convention⁴³⁹.

Furthermore, the Code outlines principles and international standards for responsible practices aimed at ensuring the effective conservation, management, and development of living aquatic resources, while respecting ecosystems and biodiversity⁴⁴⁰. The document includes several references to ALDFG in sections 7.2 on Management Objectives, 7.6 on Management Measures, and 8.4 on Fishing Operations:

7.2.1 Recognizing that long-term sustainable use of fisheries resources is the overriding objective of conservation and management, States and subregional

⁴³⁵ UNEP (2021a). *Ob. cit.*, p. 23.

⁴³⁶ Richardson, K.; Hardesty, B.D.; Wilcox, C. (2019). Estimates of fishing gear loss rates at a global scale: A literature review and meta-analysis. **Fish and Fisheries**, vol. 20, n. 6, p. 1218. DOI: <https://doi.org/10.1111/faf.12407>. Available at: <https://onlinelibrary.wiley.com/doi/full/10.1111/faf.12407>. Accessed on 03 December 2023.

⁴³⁷ For more, see p. 57 above. UN (1982a). *Ob. cit.*, n.p.

⁴³⁸ FAO Code of Conduct, Preface.

⁴³⁹ UNCLOS, Article 55.

⁴⁴⁰ Giskes, I.; *et. al.* (2022). *Ob. cit.*, p. 14.

or regional fisheries management organizations and arrangements should, *inter alia*, adopt appropriate measures, based on the best scientific evidence available, which are designed to maintain or restore stocks at levels capable of producing maximum sustainable yield, as qualified by relevant environmental and economic factors, including the special requirements of developing countries. (...)

7.6.4 The performance of all existing fishing gear, methods and practices should be examined and measures taken to ensure that fishing gear, methods and practices which are not consistent with responsible fishing are phased out and replaced with more acceptable alternatives. In this process, particular attention should be given to the impact of such measures on fishing communities, including their ability to exploit the resource. (...)

8.4.5 States, with relevant groups from industry, should encourage the development and implementation of technologies and operational methods that reduce discards. The use of fishing gear and practices that lead to the discarding of catch should be discouraged and the use of fishing gear and practices that increase survival rates of escaping fish should be promoted.

8.4.6 States should cooperate to develop and apply technologies, materials and operational methods that minimize the loss of fishing gear and the ghost fishing effects of lost or abandoned fishing gear⁴⁴¹.

Besides, the FAO Code includes the principle that fisheries should be carried out in ways that reduce waste generation and minimise environmental impacts

6.6 Selective and environmentally safe fishing gear and practices should be further developed and applied, to the extent practicable, in order to maintain biodiversity and to conserve the population structure and aquatic ecosystems and protect fish quality. Where proper selective and environmentally safe fishing gear and practices exist, they should be recognized and accorded a priority in establishing conservation and management measures for fisheries. States and users of aquatic ecosystems should minimize waste, catch of non-target species, both fish and nonfish species, and impacts on associated or dependent species (...) ⁴⁴².

The voluntary nature of the FAO Code, however, has led to limited compliance among the signatory parties⁴⁴³.

- *Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection (GESAMP)*

The Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection (GESAMP) is an advisory body, created in 1969, that provides scientific guidance to the UN system on marine environmental protection issues⁴⁴⁴.

⁴⁴¹ FAO Code of Conduct.

⁴⁴² *Ibidem*.

⁴⁴³ da Costa, J.P.; *et. al.* (2020). The Role of Legislation, Regulatory Initiatives and Guidelines on the Control of Plastic Pollution. **Frontiers in Environmental Science**, Sec. Toxicology, Pollution and the Environment, vol. 8, p. 7. DOI: <https://doi.org/10.3389/fenvs.2020.00104>. Available at: <https://www.frontiersin.org/journals/environmental-science/articles/10.3389/fenvs.2020.00104/full>. Accessed on 13 August 2024.

⁴⁴⁴ GESAMP (2024). History. Available at: <http://www.gesamp.org/about/history>. Accessed on 22 May 2024.

GESAMP has facilitated several working groups focusing on different aspects of plastics and microplastics in the ocean. Currently, the Intergovernmental Oceanographic Commission of the United Nations Educational, Scientific and Cultural Organization (IOC/UNESCO) is at the forefront of global initiatives to investigate the sources, fate, and impacts of plastics and microplastics in the marine environment. In collaboration with UNEP, IOC/UNESCO co-coordinates Working Group 40 (WG40) on Plastics and Microplastics in the Ocean within the GESAMP⁴⁴⁵.

WG40 was formed in 2012, with the additional support from IMO, NOAA, Plastics Europe, and the American Chemistry Council⁴⁴⁶. Before that, GESAMP had already identified microplastics as an emerging issue in 2008, which resulted in the creation of a scoping report and the organisation of an international workshop in 2010 on “Micro-plastic particles as a vector for transporting persistent, bio-accumulating and toxic substances in the oceans”⁴⁴⁷.

Regarding WG40, it has been divided in multiple phases. The first one, from 2012-2014 was mainly focused on the sources, transport, and impact of micro- and macro-plastics in the ocean, including their effects on marine life, ecosystems, and the economy. The second phase, from 2015-2016, included the development of methodologies and guidelines for better monitoring, as well as addressing social and economic impacts. From 2017-2020, the third phase covered the assessment of the impact of nano-sized plastics on marine organisms and evaluated plastics’ role in spreading both indigenous and non-indigenous species, providing research and policy recommendations⁴⁴⁸.

Finally, the ongoing fourth phase started in 2021 and is focused on providing a risk assessment framework for social, economic, and ecological impacts of marine litter and microplastics (Fig. 11)⁴⁴⁹. The science-based policy for this phase is the future

⁴⁴⁵ IOC-UNESCO (2023). Microplastics. Available at: <https://www.ioc.unesco.org/en/microplastics>. Accessed on 17 November 2023.

⁴⁴⁶ Initial financial support came from Plastics Europe and the American Chemistry Council but was later replaced by funding from several national governments, including the United States, China, and Japan, as well as from IOC and UNEP.

⁴⁴⁷ GESAMP (2022). **Planning of GESAMP Activities**: Sources, fate and effects of marine plastics and microplastics. GESAMP 49/4/6, 22 Aug 2022, 49th session Agenda item 4 – Report of the co-Chairs of Working Group 40. Available at: http://www.gesamp.org/site/assets/files/2240/49_4_6.pdf. Accessed on 17 November 2023.

⁴⁴⁸ GESAMP (2021). Sources, Fate and Effects of plastics and micro-plastics in the marine environment. Our work – Working Groups – WG 40: Plastics and micro-plastics. Available at: <http://www.gesamp.org/work/groups/40#:~:text=Current%20Focus%20of%20WG%2040%2C%20fourth%20phase%3A%202021%2D%20to%20present&text=The%20potential%20risks%20cover%20social,includ%20risks%20to%20human%20health>. Accessed on 13 September 2023.

⁴⁴⁹ GESAMP (2022). *Ob. cit.*, p. 1-2.

“Global Plastics Treaty” which is currently being negotiated – as it is further discussed in Part II of this thesis – and GPML Action Track 1 “Science-policy linkages”⁴⁵⁰.

Figure 11 – A brief history of Working Group 40⁴⁵¹

Year	GESAMP	Science-based policy	Support to Member States
2008 -	Microplastics as an emerging issue: – Scoping paper – International workshop	Emerging concern	Minimal concern
2012 -	WG40 Phase 1: Global assessment – sources, fate & effects	Increasing concern UNEA-1 resolution (2014)	Emerging concern
2016 -	Phase 2: Global assessment – sources, fate & effects	UNEP 2016 report to UNEA-2 (2016) AHEG UNEA-3 (2017)	Increasing concern Request for advice & support
2018 -	Phase 3: Guidelines for monitoring & assessment of marine litter & microplastics	Need for harmonised monitoring & assessment - SDG 14.1.1, UNEA 4 (2019)	Utilisation of Guidelines: – FAO Nansen – 31 MS – IAEA Tech. Coop. – Asia-Pacific & Americas – Regional Seas (UNEP)
2021 -	Phase 4: Risk assessment framework (social, economic & ecological risks from marine litter & microplastics)	Global plastics agreement - negotiation (UNEA-5, 2022 - ongoing) GPML Action Track 1 Science-policy (2021 - ongoing)	Risk-based interventions

Source: GESAMP (2022). Planning of GESAMP Activities: Sources, fate and effects of marine plastics and microplastics.

A key goal of WG40 has been to provide national and international policymakers with scientific evidence on the known and potential impacts of plastics on marine life. This was acknowledged during the first UNEA in 2014, where the GESAMP assessment was recognised in the development of Resolution 1/6:

Requests the Executive Director to support countries, upon request, in the development and implementation of national or regional action plans to reduce marine litter; (...)

Requests the Executive Director, in consultation with other relevant institutions and stakeholders, to undertake a study on marine plastic debris and marine microplastics, building on existing work and taking into account the most up-to-date studies and data, focusing on: (...)

Any other relevant priority areas identified in the GESAMP assessment of the Joint Group of Experts described in paragraph 12⁴⁵².

⁴⁵⁰ The GPML is developing five Action Tracks to advance priority areas of work by connecting key stakeholders and facilitating collaboration and coordination: 1) Science-policy linkages; 2) Action Plans on marine litter and plastic pollution; 3) Harmonization of data, standards and methodologies; 4) Sustainable and innovative financing; 5) Access for all, which includes environmental justice and digital transformation. In: GPML (2020). What we do. Available at: <https://www.gpmarinelitter.org/what-we-do>. Accessed on 15 September 2023.

⁴⁵¹ GESAMP (2022). *Ob. cit.*, p. 1-2.

⁴⁵² UNEP (2014b). **Marine plastic debris and microplastics**. United Nations Environment Assembly of the United Nations Environment Programme First session Nairobi, 23–27 June 2014 – Draft resolution submitted by the Committee of the Whole (UNEP/EA.1/L.8). Available at: https://digitallibrary.un.org/record/3966616/files/UNEP_EA.1_L.8-EN.pdf?ln=en. Accessed on 19 August 2024.

The initial assessment was expanded by WG40 and contributed to the major report on “Marine Plastic Debris and Microplastics”, presented at UNEA-2 in 2016⁴⁵³. It became widely recognised that enhanced monitoring of plastics in the ocean is crucial to inform policy decisions on litter reduction measures, helping Member States meet their obligations under UN Sustainable Development Goal 14.1 “*by 2025, prevent and significantly reduce marine pollution of all kinds, in particular from land-based activities, including marine debris and nutrient pollution*”⁴⁵⁴.

In response, in 2019 WG40 developed Guidelines for the monitoring and assessment of plastics in the marine environment, which have been adopted by national and regional bodies to tailor monitoring and assessment tools to their specific needs⁴⁵⁵.

Tackling the many marine pollution challenges affecting the global ocean demands an ongoing flow of credible, relevant, and timely scientific data to inform policy and decision-making in coastal and ocean management. In this scenario, GESAMP is a well-established scientific advisory group that offers this crucial information on a broad spectrum of marine issues and emerging concerns, supporting ten UN Sponsoring Organisations⁴⁵⁶.

- *Group of Twenty (G20) “Action Plan on Marine Litter”*

The Group of Twenty (G20) developed the “G20 Action Plan on Marine Litter” in 2017 – G20 Summit in Germany, with the goal of creating diverse tools to tackle the complex challenge of marine litter

Realizing the global nature of the challenge of marine litter, the G20 will work together to promote and initiate measures and actions at local, national, and regional levels to prevent and reduce marine litter. We recognize that the lack of effective solid waste management, wastewater treatment and storm water systems, and unsustainable production and consumption patterns, are primary land-based sources and pathways of marine litter. Taking into account the need for comprehensive multi-stakeholder involvement, we as the G20

⁴⁵³ For more, see p. 113 above. In: UNEP (2016d). *Ob. cit.*, n.p.

⁴⁵⁴ UN (2015a). Goal 14 – Conserve and sustainably use the oceans, seas and marine resources for sustainable development. Targets and indicators. Available at: https://sdgs.un.org/goals/goal14#targets_and_indicators. Accessed on 17 August 2024.

⁴⁵⁵ GESAMP (2019). **Guidelines on the monitoring and assessment of plastic litter and microplastics in the ocean** (Kershaw P.J., Turra A. and Galgani F. editors), (IMO/FAO/UNESCO-IOC/UNIDO/WMO/IAEA/UN/UNEP/UNDP/ISA Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection). Rep. Stud. GESAMP No. 99, 130p. Available at: <http://www.gesamp.org/publications/guidelines-for-the-monitoring-and-assessment-of-plastic-litter-in-the-ocean>. Accessed on 22 April 2023.

⁴⁵⁶ Watson-Wright, W.M.; *et al.* (2024). The UN Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection (GESAMP) — An ocean science-policy interface standing the test of time. **Marine Pollution Bulletin**, vol. 199, p. 1. DOI: <https://doi.org/10.1016/j.marpolbul.2023.115917>. Available at: <https://www.sciencedirect.com/science/article/pii/S0025326X23013528>. Accessed on 16 June 2024.

acknowledge the role of non-state actors and further encourage private sector engagement and the development of environmental protection solutions to reduce marine litter⁴⁵⁷.

Recognising the urgency of the problem, the G20 members decided to collaborate on promoting and implementing measures at local, state, and regional levels to prevent and reduce litter in the marine environment. They acknowledged the need to address both land- and sea-based sources of pollution and pledged to work in line with each country's circumstances⁴⁵⁸.

Additionally, they committed to preventing and significantly reducing marine litter by 2025 in alignment with the 2030 Agenda for Sustainable Development and its SDGs

We, the G20, will take action to prevent and reduce marine litter of all kinds, including from single-use plastics and micro-plastics. We thus reiterate our commitment to preventing and substantially reducing marine litter and its impacts by 2025 in support of the 2030 Agenda for Sustainable Development and its Sustainable Development Goals and targets related to marine pollution, waste management, wastewater treatment and sustainable consumption and production by putting into practice the following 'G20 Operational Framework' and the voluntary Global Network of the Committed (GNC)⁴⁵⁹.

To support these goals, the G20 established the voluntary Global Network of the Committed (GNC), a platform designed to facilitate the exchange, dissemination, and transfer of information, standards, experiences, and knowledge related to marine litter, and is linked to the GPML⁴⁶⁰.

Within the G20, some of the members have taken collective action on the matter – in the absence of a global LBI on plastic pollution. Five G7 members – Canada, France, Germany, Italy, the United Kingdom – along with the European Union, signed the “Ocean Plastics Charter” at the 2018 G7⁴⁶¹ meeting in Charlevoix, Canada. The USA and Japan were the only members that did not endorse the charter⁴⁶².

The G7 had addressed marine pollution in previous meetings, but this was the first time they specifically focused on marine plastic pollution. The Charter exemplifies a

⁴⁵⁷ G20 Action Plan on Marine Litter, Paragraph 2. In: G20 (2017). **G20 Action Plan on Marine Litter**. Germany, Hamburg, 8p. Available at: <https://www.mofa.go.jp/mofaj/files/000272290.pdf>. Accessed on 18 September 2024.

⁴⁵⁸ Nagtzaam, G.; *et. al.* (2023). *Ob. cit.*, p. 217.

⁴⁵⁹ G20 Action Plan on Marine Litter, Paragraph 4.

⁴⁶⁰ Nagtzaam, G.; *et. al.* (2023). *Ob. cit.*, p. 217.

⁴⁶¹ The G7 is an informal platform for discussion that unites seven highly industrialised countries: Canada, France, Germany, Japan, Italy, the United Kingdom, the United States, and the European Union.

⁴⁶² G7 (2018). **Ocean Plastics Charter**. Charlevoix, Canada. Available at: https://www.consilium.europa.eu/media/40516/charlevoix_oceans_plastic_charter_en.pdf. Accessed on 12 June 2023.

“*minilateralism*”, where a small group of States collaborates to tackle an issue – rather than through formal, larger UN meetings⁴⁶³.

The Charter is a non-binding, voluntary agreement that outlines specific actions to eliminate plastic pollution and acknowledges the urgent need to address the harmful effects of marine litter on ocean health, coastal communities, and ecosystems. The document also includes a commitment to achieving “*100% reusable, recyclable, or, where viable alternatives do not exist, recoverable, plastics by 2030*”⁴⁶⁴. Since its creation, many other States, business and organisations have endorsed the Charter⁴⁶⁵.

These initiatives were reaffirmed at the 2019 G20 Summit in Japan, where countries committed to national actions to prevent and significantly reduce plastic litter and microplastics discharges into the ocean⁴⁶⁶.

This 2019 Summit also endorsed the Osaka Blue Ocean Vision, which aims to “*reduce additional pollution by marine plastic litter to zero by 2050*” employing a comprehensive life-cycle approach, better waste management, and innovative solutions, while acknowledging the societal benefits of plastics⁴⁶⁷. Additionally, the G20 Implementation Framework for Actions on Marine Plastic Litter was endorsed⁴⁶⁸.

The Osaka Blue Ocean Vision’s goal of achieving net-zero marine plastic litter by 2050 is commendable. However, while the vision is a positive step forward, the G20 nations must do more than simply share a common goal; they need to implement better plastic waste management (PWM) strategies. A global mechanism is essential to effectively monitor progress while quickly developing alternative materials for plastics⁴⁶⁹.

⁴⁶³ Nagtzaam, G.; *et. al.* (2023). *Ob. cit.*, p. 217-218.

⁴⁶⁴ G7 (2018). *Ob. cit.*, p. 2.

⁴⁶⁵ Government of Canada (2024). Ocean Plastics Charter. Ambition – Aim and scope – Partners – How to endorse – Read the Ocean Plastics Charter. Available at: <https://www.canada.ca/en/environment-climate-change/services/managing-reducing-waste/international-commitments/ocean-plastics-charter.html>. Accessed on 22 December 2024.

⁴⁶⁶ UNEP (2021b). *Ob. cit.*, p. 90.

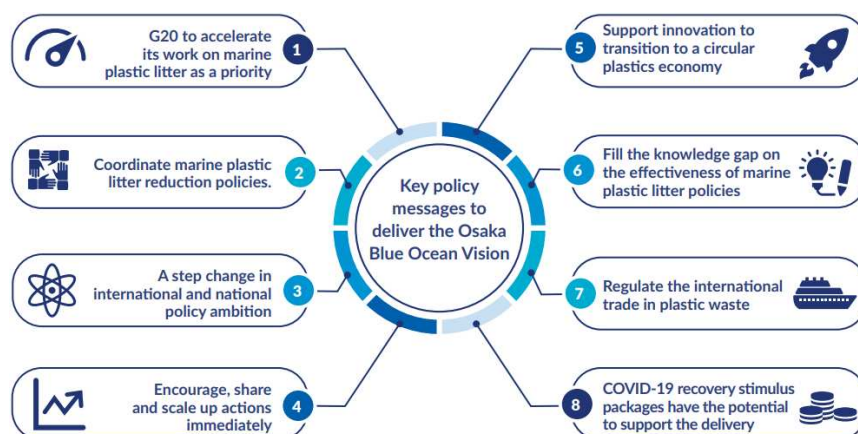
⁴⁶⁷ IRP (2021). Policy options to eliminate additional marine plastic litter by 2050 under the G20 Osaka Blue Ocean Vision. Fletcher, S., Roberts, K.P., Shiran, Y., Virdin, J., Brown, C., Buzzi, E., Alcolea, I.C., Henderson, L., Laubinger, F., Milà i Canals, L., Salam, S., Schmuck, S.A., Veiga, J.M., Winton, S., Youngblood, K.M. Report of the International Resource Panel. United Nations Environment Programme. Nairobi, Kenya. Available at: https://www.resourcepanel.org/sites/default/files/documents/document/media/policy_options_to_eliminate_additional_marine_plastic_litter.pdf. Accessed on 15 May 2023.

⁴⁶⁸ G20 (2019). **G20 Implementation Framework for Actions on Marine Plastic Litter**. Osaka, Japan. Available at: https://www.mofa.go.jp/policy/economy/g20_summit/osaka19/pdf/documents/en/annex_14.pdf. Accessed on 19 May 2023.

⁴⁶⁹ Nagtzaam, G.; *et. al.* (2023). *Ob. cit.*, p. 220.

To achieve these goals, G20 nations must prioritise addressing marine plastic pollution, coordinate policies to reduce plastic litter, adopt global targets tailored for national implementation, develop and scale policies that promote circular plastic production and consumption, transition swiftly to a circular plastics economy, bridge the knowledge gap on the effectiveness of marine litter policies and fully regulate the international plastics trade – as shown in Figure 12:

Figure 12 – Key conclusions/policy messages to deliver the Osaka Blue Ocean Vision⁴⁷⁰



Source: IRP (2021). Policy options to eliminate additional marine plastic litter by 2050 under the G20 Osaka Blue Ocean Vision.

Moreover, in 2024, the ocean has gained even more prominence on the G20 agenda, with the creation of an engagement group “Oceans 20” (O20) – which is aligned with one of Brazil’s priorities as President of the G20⁴⁷¹.

In fact, since assuming the presidency of the group, Brazil has proposed new agendas for the Global South, with the aim – among others – of strengthening the fight for sustainable development, demonstrating its interest in creating a Task Force to mobilise against climate change, bringing its particular perspectives to promote a fair and inclusive transition⁴⁷².

The aim of O20, therefore, is to establish a dialogue to ensure sustainability and ocean-based economic activities – the so-called “Blue Economy”⁴⁷³ – and to debate

⁴⁷⁰ IRP (2021). *Ob. cit.*, p. 43.

⁴⁷¹ G20 Brasil (2024a). **Oceans20 Communiqué** –A Call to G20 Leadership. Driving Economic Prosperity, Climate Action, and Security through Ocean Stewardship, p. 7. Available at: https://www.oceans20brasil.org/_files/ugd/0a78ab_642ed6e162d744d58ef92d5c0eb798ad.pdf. Accessed on 27 November 2024.

⁴⁷² UN Sustainable Development Group (2024). Ambitious commitments mark the end of Brazil’s G20 Presidency. Available at: <https://unsdg.un.org/latest/stories/ambitious-commitments-mark-end-brazils-g20-presidency>. Accessed on 21 December 2024.

⁴⁷³ The blue economy is an important driver of urban and regional development, providing millions of local jobs. It can be understood as the sustainable use of ocean resources for economic growth. In: World Bank

issues such as its relationship with the climate⁴⁷⁴, conservation and governance of the high seas, safeguarding coastal livelihoods, pollution and ocean protection.

The recently published “Oceans20 Communiqué” displays 10 Priority Themes which were identified from more than 100 recommendations gathered during the Ocean Dialogues. The O20 co-conveners recognised these as the most critical areas that require urgent action to ensure a healthy ocean and transition to a sustainable and equitable ocean economy. Among them, Theme 4 “*conserving and restoring marine resources and ecosystems*” provides within its goals to

3. Address Marine Pollution Through Comprehensive Approaches

Address marine pollution and reduce waste, including plastic waste and untreated sewage, through a holistic strategy involving local governments, the private sector, civil society, and academia. This approach should enforce regulations, conduct Environmental Impact Assessments, and promote clean technologies to minimize pollution sources and address upstream and transboundary pollution effectively⁴⁷⁵.

The O20 highlights the deep connection between ocean health, economic growth, social inclusion, climate resilience, and global security. While the G20 members account for approximately two-thirds of global plastic waste (with China, the USA, and Germany being the leading producers), they also acknowledge the issue and are taking preventive actions – both individually and collectively⁴⁷⁶.

In this regard, the Leaders of G20 gathered in Rio de Janeiro on 18-19 November 2024 to tackle significant global challenges and crises, while advocating for robust, sustainable, balanced, and inclusive growth. They reaffirmed their commitment to “*building a just world and a sustainable planet*” and, in the *G20 Rio de Janeiro Leader’s Declaration*, they proclaim to be

(...) **determined to end plastic pollution** and commit to working together with the ambition to conclude by the end of 2024 the negotiations of an ambitious, fair and transparent international legally binding instrument on plastic pollution, including in the marine environment, based on a comprehensive approach in line with the mandate of UNEA resolution 5/14, at

(2016). **Oceans 2030** – Financing the Blue Economy for a Sustainable Development. World Bank Group, 2016. Available at: <https://thedocs.worldbank.org/en/doc/446441473349079068-0010022016/original/AMCOECCBlueEconomyDevelopmentFramework.pdf>. Accessed on 15 November 2024.

⁴⁷⁴ The ocean plays a key role in regulating climate and weather, storing solar radiation and distributing heat and moisture across the globe. In: G20 Brasil (2024b). Environment and Climate Sustainability, Working Group Issue Note, 2024. Available at: <https://www.g20.org/en/news/documents/g20-brazil-concept-note.pdf/@download/file>. Accessed on 13 November 2024.

⁴⁷⁵ G20 Brasil (2024a). *Ob. cit.*, p. 20.

⁴⁷⁶ Fadeeva, Z.; Van Berkel, R. (2021). Unlocking circular economy for prevention of marine plastic pollution: An exploration of G20 policy and initiatives. **Journal of Environmental Management**, vol. 277, 111457, p. 1. DOI: <https://doi.org/10.1016/j.jenvman.2020.111457>. Available at: <https://www.sciencedirect.com/science/article/abs/pii/S0301479720313827?via%3Dihub>. Accessed on 07 February 2022.

the Fifth Session of the Intergovernmental Negotiating Committee (INC-5) in Busan, Republic of Korea⁴⁷⁷. (*author's emphasis*)

With rising environmental and socio-economic challenges, the G20 is uniquely positioned to lead a transformative agenda that harnesses the ocean's potential for sustainable development⁴⁷⁸ – while tackling, as well, MPP.

In fact, seven of the ten major rivers responsible for transporting land-based plastic pollution to the ocean flow through China, India, and Indonesia, underscoring the critical role of G20 members in leading efforts to reduce marine litter, especially plastics⁴⁷⁹.

There is a need for immediate, coordinated action, recognising the ocean as both a resource and a vital partner in building a resilient, equitable future. The O20 has the potential to be a symbol of international collaboration, where G20 leadership sparks a new era of ocean-centred solutions to drive economic prosperity, environmental sustainability, and long-lasting security – “*the time for decisive action is now*”⁴⁸⁰.

In this sense, in May 2025 Brazil also hosted the 7th Meeting of the BRICS⁴⁸¹ Working Group on Polar and Ocean Science and Technology, which gathered delegates from India, Russia, South Africa, China, Egypt, and the United Arab Emirates⁴⁸².

The opening session was dedicated to the presentation of national initiatives on monitoring polar and oceanic regions, with particular attention to meteorology, marine biology, flux measurements, climate prediction, and disaster prevention. Beyond the aim of expanding scientific knowledge, the Working Group emphasised the creation of cooperative mechanisms to anticipate and respond to extreme events, such as the recent floods in Rio Grande do Sul (Brazil) that had repercussions also in other BRICS countries⁴⁸³.

⁴⁷⁷ G20 Brasil (2024c). **G20 Rio de Janeiro Leaders' Declaration**. Available at: <https://g20.org/wp-content/uploads/2024/11/G20-Rio-de-Janeiro-Leaders-Declaration-EN.pdf>. Accessed on 12 December 2024.

⁴⁷⁸ G20 Brasil (2024a). *Ob. cit.*, p. 34.

⁴⁷⁹ Fadeeva, Z.; Van Berkel, R. (2021). *Ob. cit.*, p. 2.

⁴⁸⁰ G20 Brasil (2024a). *Ob. cit.*, p. 34.

⁴⁸¹ Although the acronym “BRICS” originally referred to Brazil, Russia, India, China, and South Africa, the group today comprises eleven countries: to the five founding members were added, between 2024 and 2025, six new states – Egypt, Ethiopia, Indonesia, Iran, Saudi Arabia, and the United Arab Emirates.

⁴⁸² BRICS Brasil 2025 (2025). Scientific cooperation among BRICS countries strengthens oceanic and polar research. Available at: <https://brics.br/en/news/scientific-cooperation-among-brics-countries-strengthens-oceanic-and-polar-research>. Accessed on 28 August 2025.

⁴⁸³ In May 2024, the state of Rio Grande do Sul was hit by the largest climate disaster in its recent history, marked by floods that affected more than 2.3 million people. The surveys conducted during that period highlighted the alarming magnitude of the tragedy: at least 27 people missing, 806 injured, 478 municipalities affected, and 183 confirmed deaths. The environmental disasters that occurred in Rio Grande

Several common challenges were highlighted, including insufficient real-time data collection, the need to strengthen forecasting and modelling tools, and the enhancement of technical capacities. India, China, and Russia, for instance, pointed to persisting gaps in their ocean observation networks, which underscores the strategic relevance of reinforcing partnerships within the BRICS framework. In this scenario, science is framed not only as an instrument of analysis but as a fundamental solution to shared transnational problems. Joint scientific responses are therefore considered essential to addressing global challenges such as climate change, transformations in marine ecosystems, and the migration of species⁴⁸⁴.

- *World Trade Organization (WTO)*

Plastics are traded in vast quantities at nearly every stage of their life cycle, with many countries acting as both importers and exporters. As such, trade plays a crucial role in transitioning to a more circular and sustainable global plastics economy – an economic model that many nations have identified as a goal and that can help achieving the SDGs⁴⁸⁵.

Various opportunities are being explored to leverage trade to promote greater circularity or address unsustainable plastics, with discussions taking place in international forums such as the International Organization for Standardization (ISO), the World Customs Organization (WCO), the United Nations Conference on Trade and Development (UNCTAD), the Organisation for Economic Co-operation and Development (OECD) and the World Trade Organization (WTO) – all of which are providing platforms for intergovernmental discussions⁴⁸⁶.

do Sul reveal the interconnection between local events and the broader effects of climate change, which impacts not only the environment and biodiversity, but also the economy and society – that is, all the pillars of sustainable development. In: Noskosk, L.E.C.; Gysi, E. (2024). Desafios climáticos e desastres naturais no Rio Grande do Sul: urgência de ações integradas e sustentáveis. **Fronteiras do conhecimento: um diálogo entre disciplinas**, vol. 1, n. 76. DOI: <https://doi.org/10.47879/ed.ep.2024486p41>. Available at: <https://portal.epitaya.com.br/index.php/ebooks/article/view/1082>. Accessed on 13 December 2024.

⁴⁸⁴ BRICS Brasil 2025 (2025). *Ob. cit.*, n.p.

⁴⁸⁵ van der Marel, E. R. (2024). Plastics regulation and international trade. In: **Research Handbook on Plastics Regulation** Law, Policy and the Environment. Editors Elizabeth A. Kirk, Naporn Popattanachai, Richard Barnes and Eva R. van der Marel. Cheltenham, UK: Edward Elgar Publishing, p. 145. ISBN: 978 1 80220 151 2. DOI: <https://doi.org/10.4337/9781802201529>. Available at: <https://www.elgaronline.com/edcollbook/book/9781802201529/9781802201529.xml>. Accessed on 23 December 2024.

⁴⁸⁶ Barrowclough, D.; Birkbeck, C.D. (2022). Transforming the Global Plastics Economy: The Role of Economic Policies in the Global Governance of Plastic Pollution. **Social Sciences**, vol. 11(1), n. 26, p. 18. DOI: <https://doi.org/10.3390/socsci11010026>. Available at: <https://www.mdpi.com/2076-0760/11/1/26>. Accessed on 13 August 2024.

The ISO has developed numerous standards relevant to combating plastic pollution. These include standards created by the ISO technical committees on plastics (ISO/TC 61) and environmental management (ISO/TC 207)⁴⁸⁷; WCO is actively engaged in combating waste trafficking, acknowledging that the illegal trade in plastic waste and the improper environmental management of such waste pose significant threats to the environment and human health – with Customs playing a crucial role in addressing this issue⁴⁸⁸; UNCTAD is focused on finding plastics substitutes and alternatives, as well as it has been tasked with “*addressing the discharge of plastic litter and other waste in oceans and significantly reducing marine pollution of all kinds and ensuring sustainable consumption and production patterns*”⁴⁸⁹; and the OECD, through its Environment Policy Committee, has prioritised the transition to a CE, with a particular emphasis on plastics⁴⁹⁰.

Discussions on banning imports of non-industrial plastic waste have taken place in various WTO Committees, and in late 2020, a group of WTO members launched the Informal Dialogue on Plastics Pollution and Environmentally Sustainable Plastics Trade (IDP)⁴⁹¹. In June 2021, over 65 WTO Members issued a ministerial statement, reaffirming their commitment to exploring trade policy options to support global efforts to reduce plastic pollution⁴⁹².

The IDP offers a platform for WTO members to explore how the organisation can support national, regional, and global efforts to address plastic pollution and transition to a more circular and sustainable plastics trade. This initiative may also result in greater

⁴⁸⁷ ISO (2023). How standards address plastic pollution. Issue brief, p. 3. Available at: <https://www.iso.org/files/live/sites/isoorg/files/store/en/PUB100473.pdf>. Accessed on 27 May 2024.

⁴⁸⁸ WCO (2023). World Environment Day - Fighting environmental crime remains a key priority for the WCO. Available at: <https://www.wcoomd.org/en/media/newsroom/2023/june/world-environment-day.aspx?p=1>. Accessed on 12 November 2024.

⁴⁸⁹ UNCTAD (2021). The Bridgetown Covenant. From inequality and vulnerability to prosperity for all (TD/L.435). Fifteenth session Virtual Barbados 3–7 October 2021 Item 8 of the agenda (TD/L.435). Available at: https://unctad.org/system/files/official-document/td-l-435_en.pdf. Accessed on 18 September 2024.

⁴⁹⁰ OECD (2018). **Improving Markets for Recycled Plastics** – Trends, Prospects and Policy Responses. Available at: https://www.oecd.org/en/publications/improving-markets-for-recycled-plastics_9789264301016-en.html. Accessed on 18 September 2024.

⁴⁹¹ WTO (2022). Informal Dialogue on Plastic Pollution and Environmentally Sustainable Plastics Trade – Background information for press. Available at: https://www.wto.org/english/thewto_e/minist_e/mc12_e/idp_press_background.pdf. Accessed on 12 November 2024.

⁴⁹² WTO (2021). Informal Dialogue on Plastic Pollution and Environmentally Sustainable Plastics Trade (IDP). MC12 Ministerial Statement on plastic pollution and environmentally sustainable plastics trade. Ministerial Conference Twelfth Session Geneva, 30 November-3 December 2021 (WT/MIN(21)/8). Available at: <https://docs.wto.org/dol2fe/Pages/SS/directdoc.aspx?filename=q:/WT/MIN21/8.pdf&Open=True>. Accessed on 13 September 2024.

transparency regarding the number and types of national plastics-related measures being reported to the WTO⁴⁹³.

Along with the structured discussions on trade and sustainability, which were also launched in 2020, and ongoing talks in the WTO Committee on Trade and Environment (CTE), the exchanges at the IDP have highlighted areas where trade intersects with the plastic pollution issue⁴⁹⁴. They have identified potential opportunities to promote environmentally sustainable plastics trade and offered recommendations for further action at the WTO⁴⁹⁵.

The WTO has increasingly become an important forum for discussing the trade-related aspects of plastics. This could not only help address potential barriers to free trade but also encourage the use of substitute materials by reducing tariffs and other obstacles to environmental goods and services or support the development of better recycling infrastructure through capacity-building initiatives like the Aid for Trade Initiative^{496,497}.

The need to promote cooperation and dialogue at the WTO is particularly clear when considering the emerging legal challenges stemming from various national laws related to plastics. For instance, since the 1990s, global plastic waste trade heavily relied on China, which imported up to 72.4% of the world's plastic waste over a 30-year period. However, in 2018, China imposed a ban on the importation of most plastics, a move that is expected to displace 111 million tonnes of plastic waste by 2030. This decision caused significant disruptions globally, prompting plastic waste exporters to seek new destinations⁴⁹⁸.

⁴⁹³ van der Marel, E. R. (2024). *Ob. cit.*, p. 146.

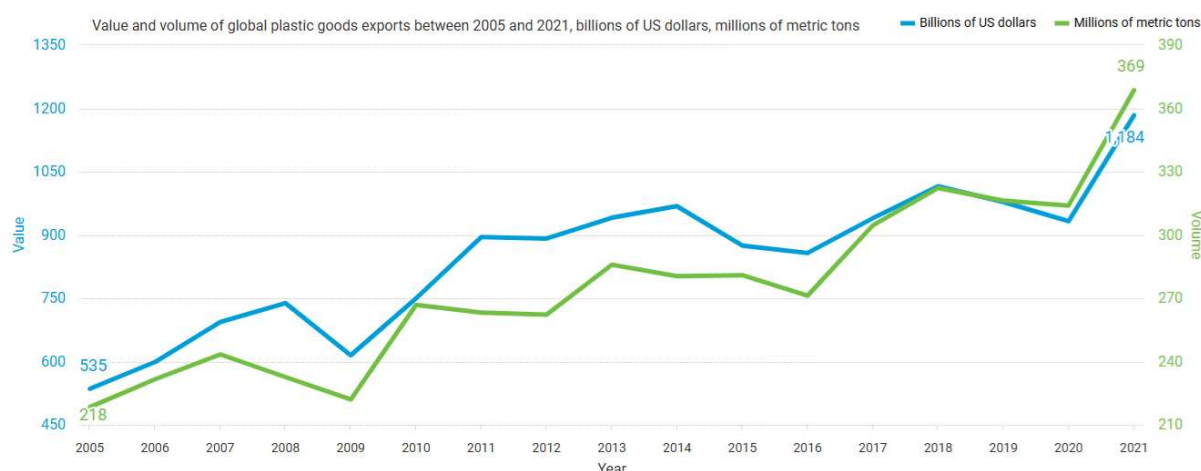
⁴⁹⁴ WTO (2024). Dialogue on Plastic Pollution and Environmentally Sustainable Plastics Trade (DPP) MC13 Statement Revision (INF/TE/IDP/W/10/Rev.2). Available at: <https://www.tralac.org/documents/resources/external-relations/wto/mc13/5217-dialogue-on-plastic-pollution-and-environmentally-sustainable-plastics-trade-dpp-mc13-statement-revision-19-january-2024/file.html>. Accessed on 13 September 2024.

⁴⁹⁵ van der Marel, E. R. (2024). *Ob. cit.*, p. 146.

⁴⁹⁶ WTO (2024). Aid for Trade. Available at: https://www.wto.org/english/tratop_e/devel_e/a4t_e/aid4trade_e.htm. Accessed on 06 December 2024.

⁴⁹⁷ Aid for trade is increasingly recognised as a crucial mechanism for assisting developing and least developed countries in transitioning to more sustainable trade practices, while also strengthening environmental resilience and promoting economic diversification essential for sustainable development. Increased aid for trade focused on the trade-related aspects of plastic pollution – a growing global threat to the environment, public health, and sustainable development – can bolster efforts within the IDP at the WTO.

⁴⁹⁸ This subject is further discussed in Chapter II, Section I, Subsection B. For more, *see* Environmental Investigation Agency (2021). Ocean – The Truth Behind Trash: The scale and impact of the international trade in plastic waste, p. 7. Available at: <https://eia-international.org/wp-content/uploads/EIA-The-Truth-Behind-Trash-FINAL.pdf>. Accessed on 12 April 2023.

Figure 13 – The soaring global plastics trade⁴⁹⁹

Source: UNCTAD (2022). Global plastics trade hits record \$1.2 trillion.

As Figure 13 demonstrates, since 2005, global exports of plastics and plastic-based goods have more than doubled in value, surpassing USD 1 trillion in 2018 and reaching nearly USD 1.2 trillion in 2021. The increase in volume has been slightly slower but follows a similar trend, growing from 218 million metric tons in 2005 to 369 million in 2021. This surge in global plastic trade includes products made from plastic, such as children's toys, electronics with plastic components, and items wrapped in plastic – such as office furniture and snacks. It also encompasses the raw materials used to produce plastics, mainly fossil fuels, and plastic-containing waste, such as discarded smartphones⁵⁰⁰.

Plastics represent a diverse group of chemicals with different applications, risks, and challenges, requiring a variety of regulatory, economic, and policy responses. However, the current lack of coherence among WTO members in addressing these issues has raised concerns⁵⁰¹.

As outlined previously, currently there is only one international instrument explicitly addressing plastic trade: the Basel Convention. There are few relevant international standards on plastics, no unified approaches to sustainable plastic regulation and the CE, and a lack of key shared definitions (e.g., recycling, bio-based plastics)⁵⁰².

⁴⁹⁹ UNCTAD (2022). Global plastics trade hits record \$1.2 trillion. Available at: <https://unctad.org/data-visualization/global-plastics-trade-reached-nearly-1.2-trillion-2021>. Accessed on 17 October 2024.

⁵⁰⁰ UNCTAD (2024). Making trade work better for the planet. Available at: <https://unctad.org/news/making-trade-work-better-planet>. Accessed on 17 October 2024.

⁵⁰¹ van der Marel, E. R. (2024). *Ob. cit.*, p. 146.

⁵⁰² Although the negotiating committee for the future plastics treaty is working on this, as will be detailed in the appropriate section of this paper. For more, see "Glossary of key terms". In: UNEP (2022e). Glossary of key terms. Intergovernmental negotiating committee to develop an international legally binding

The WTO along with other mechanisms, like the Basel Convention, could further promote dialogue and action on these options during ministerial conferences. It could also collaborate with other international organisations, intergovernmental processes, and multi-stakeholder partnerships to enhance the multilateral trading system's capacity to achieve its primary goal of sustainable development⁵⁰³.

It is expected that increasing awareness among WTO members regarding the importance of WTO law in plastics regulation, coupled with ongoing cooperation with other bodies and instruments, will result in more consistent plastics regulation and reduce the likelihood of challenges before the WTO⁵⁰⁴.

- *Strategic Approach to International Chemicals Management (SAICM)*

The Strategic Approach to International Chemicals Management was adopted in 2006⁵⁰⁵ at the First International Conference on Chemicals Management (ICCM-1) in Dubai and served as a policy framework aimed at promoting chemical safety globally⁵⁰⁶.

SAICM aimed at promoting chemical safety worldwide, with the primary objective of achieving the appropriate management of chemicals throughout their life cycle, in order to minimise their significant adverse impacts on the environment and human health⁵⁰⁷. It is one of the important soft law instruments relevant to mitigating the negative effects of plastic waste and microplastics, adopting a holistic approach with broad inclusion of all relevant sectors and stakeholders⁵⁰⁸ – and complementing the Stockholm Convention⁵⁰⁹.

In fact, the Global Action Plan created under SAICM provides a voluntary framework for managing chemicals not addressed by the Stockholm Convention and can

instrument on plastic pollution, including in the marine environment First session Punta del Este, Uruguay, 28 November–2 December 2022 Item 4 of the provisional agenda (UNEP/PP/INC.1/6). Available at: <https://uneplivemapservices.unep.org/bitstream/handle/20.500.11822/40683/K2221529%20-%20UNEP-PP-INC.1-6%20-%20Advance.pdf?sequence=1&isAllowed=y>. Accessed on 17 December 2022.

⁵⁰³ UNEP (2021b). *Ob. cit.*, p. 89.

⁵⁰⁴ van der Marel, E. R. (2024). *Ob. cit.*, p. 165.

⁵⁰⁵ SAICM emerged from the urgent need to adopt concrete projects and priorities in the context of a strategic approach to international chemicals management, working with key partners such as the secretariats of the Rotterdam Convention, the Stockholm Convention and the Basel Convention, among others.

⁵⁰⁶ UNEP (2021b). *Ob. cit.*, p. 89-90.

⁵⁰⁷ UNEP; SAICM (2019a). Strategic Approach to International Chemicals Management. About – Overview. Available at: <https://www.saicm.org/About/Overview/tabid/5522/language/en-US/Default.aspx>. Accessed on 22 September 2024.

⁵⁰⁸ UNEP (2017a). *Ob. cit.*, p. 40.

⁵⁰⁹ Schäli, J. (2022). **The Mitigation of Marine Plastic Pollution in International Law** – Facts, Policy and Legal Implications. Leiden, The Netherlands: Brill | Nijhoff, p. 287. DOI: <https://doi.org/10.1163/9789004508613>. Available at: <https://brill.com/display/title/61770>. Accessed on 19 September 2023.

assist in setting national reduction targets⁵¹⁰. The Strategy comprised three main documents: the Dubai Declaration on International Chemicals Management; the Overarching Policy Strategy; and a Global Plan of Action⁵¹¹.

Since its adoption in 2006, SAICM has established a proactive, inclusive, and comprehensive platform for the engagement and commitment of governments, IGOs, NGOs, and industry. It provides an international, voluntary, and non-binding approach aimed at achieving the 2020 goal – agreed at the 2002 Johannesburg Summit (Rio+ 10) – of achieving “*the sound management of chemicals throughout their life cycle so that by the year 2020, chemicals are produced and used in ways that minimize significant adverse impacts on the environment and human health*”⁵¹².

SAICM recognises that while chemicals are an essential part of everyday life, their impact on biodiversity can be limited through legal frameworks that address the entire life cycle of chemicals and waste. It highlights that – especially after the outbreak of the Covid-19 pandemic – it is essential that civil society avoids the consumption of single-use plastics and tries to limit unnecessary consumption and waste.

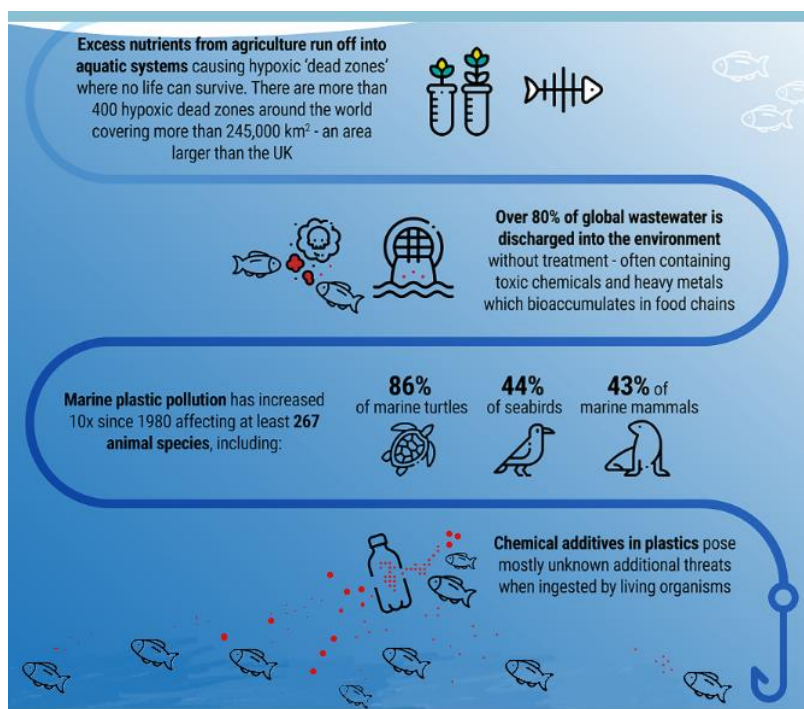
This is important especially when considering that marine plastic pollution has increased tenfold since 1980, affecting at least 267 animal species, including 86% of sea turtles, 44% of seabirds and 43% of marine mammals⁵¹³ (Fig. 14):

⁵¹⁰ UNEP (2017a). *Ob. cit.*, p. 15.

⁵¹¹ SAICM Secretariat (2006). Strategic Approach to International Chemicals Management Comprising the Dubai Declaration on International Chemicals Management, the Overarching Policy Strategy and the Global Plan of Action. Available at: https://www.fao.org/fileadmin/templates/agphome/documents/Pests_Pesticides/Code/SAICMdeclaration.pdf. Accessed on 22 November 2023.

⁵¹² UNEP; SAICM (2019a). *Ob. cit.*, n.p.

⁵¹³ UNEP (2020d). SAICM Knowledge – Safer use of chemicals can help protect biodiversity. Available at: <https://saicmknowledge.org/library/safer-use-chemicals-can-help-protect-biodiversity>. Accessed on 19 September 2023.

Figure 14 – Biodiversity in danger from poor management of chemicals and waste⁵¹⁴

Source: UNEP (2020d). SAICM “Safer Use of Chemicals Can Help Protect Biodiversity”.

The hazard and risk assessment of chemicals is framed as a voluntary measure within SAICM, which has prompted numerous countries to establish regulatory frameworks for chemical safety. However, the significant number of chemicals lacking hazard data indicates weak regulatory capacity and enforcement in many nations. Additionally, a major challenge is that many countries have regulatory gaps – such as not requiring hazard and risk profiles for polymers or failing to update testing practices in line with the latest scientific developments⁵¹⁵.

Furthermore, SAICM’s ICCM has recognised and recommended appropriate action on several “Emerging Policy Issues” and “Other Issues of Concern”, many of which are strongly connected to plastic additives. They include: chemicals in products (CiP); EDCs; environmentally persistent pharmaceutical pollutants (EPPPs); hazardous substances within the life cycle of electrical and electronic products (HSLEEP); lead in paint, and nanotechnology and manufactured nanomaterials; and the two other issues of concern are highly hazardous pesticides (HHPs) and per- and polyfluoroalkyl substances

⁵¹⁴ UNEP (2020d). *Ob. cit.*, n.p.

⁵¹⁵ BRS (2023). *Ob. cit.*, p. 11.

(PFASs)⁵¹⁶ (Fig. 15). Various efforts have been made at the national, regional, and international levels to tackle these issues.

Figure 15 – Plastics and chemical additives in products⁵¹⁷

	 Plastic use per sector	 Types of chemical additives found in plastics in sector products
 Toys	90% of toys in the market are made of plastics. Chemicals of concern often enter the lifecycle of toys during the production phase or through recycling materials.	Plastics used in toys contain additives, and sometimes are found to contain hazardous ones, such as phthalates, BPA or POPs. POPs and brominated flame retardants, originally used in plastics for the electronics sector, can be found in toys made of recycled plastics. Heavy metals have been found to be used as additives, pigments or in PVC parts of toys.
 Electronics	Plastics in electrical and electronic products account for about 20% of material used in plastics. Waste in electrical and electronic equipment (WEEE) are considered to be one of the fastest-growing waste streams globally. The annual value of global e-waste as over \$62.5 billion, more than the GDP of most countries. More than 44 million tonnes of electronic and electrical waste was produced globally in 2017 – over six kilograms for every person on the planet.	Some POPs performing as flame retardant (especially PBDEs) hamper recycling rates in the sector. Additionally, these restricted substances may be reintroduced through recycling processes, possibly in sensitive categories such as toys or food contact materials. Heavy metals can be found in recycled plastics from electronics.
 Buildings and construction products	The global buildings and construction plastic market was valued at \$57.9 million in 2017 and is expected to reach \$104.5 million by 2025. Plastic is widely used as construction material: about 21% of the 47 million tonnes of plastic used in Europe goes into the construction sector.	Polymer foams such as polystyrene are used for insulation. Phthalates can be found in flooring made of PVCs. PCBs can still be found in coating and in sealants. Flame retardants are added to foam in order to meet flammability requirements. Some flame retardants used are brominated flame retardants (HBCDD and DecaBDE) have an exemption under the Stockholm Convention to be used in construction insulation materials. If not soundly managed, these chemicals may pose a risk to the environment at end-of-life.

Source: SAICM (2020). Plastics and Chemicals of Concern in Consumer Products, Policy Brief.

A policy brief on chemicals and plastics has been released under SAICM to tackle plastic-associated chemicals. UNEP has also compiled a list of identified EDCs, many of which are additives in plastics⁵¹⁸.

Due to its multi-stakeholder approach, additional activities focused on hazardous chemicals in plastics could be included in SAICM's "Beyond 2020" process⁵¹⁹. That because the mandate of SAICM expired in 2020, well before achieving the goal of minimising the health and environmental impacts of chemicals throughout their lifecycle. As Figure 16 shows, overall progress has been inconsistent, and there remains a substantial need for the development and implementation of effective chemical and waste management policies and practices worldwide⁵²⁰:

⁵¹⁶ UNEP (2020c). An Assessment Report on Issues of Concern: Chemicals and Waste Issues Posing Risks to Human Health and the Environment. ISBN: 978-92-807-3808-7, p. 5. Available at: <https://saicmknowledge.org/sites/default/files/publications/Issues%20of%20Concern%20report%20September%202020.pdf>. Accessed on 08 October 2022.

⁵¹⁷ SAICM (2020). Plastics and Chemicals of Concern in Consumer Products. Policy Brief, p. 2. Available at: https://saicmknowledge.org/sites/default/files/resources/FINAL_Policy_Brief_plastics%20and%20CoCs%20in%20consumer%20products_july30.pdf. Accessed on 13 December 2022.

⁵¹⁸ UNEP (2017e). Overview Report I: Worldwide initiatives to identify endocrine disrupting chemicals (EDCs) and potential EDCs. Prepared by: The International Panel on Chemical Pollution (IPCP). Available at:

https://wedocs.unep.org/bitstream/handle/20.500.11822/25633/EDC_report1.pdf?sequence=1&isAllowed=y. Accessed on 13 December 2022.

⁵¹⁹ UNEP; BRS (2023). *Ob. cit.*, p. 51-52.

⁵²⁰ UNEP; SAICM (2019b). SAICM – Factsheet. Available at: <https://www.saicm.org/Portals/12/Documents/SAICM-Factsheet.pdf>. Accessed on 22 September 2024.

Figure 16 – Beyond 2020: the current landscape⁵²¹

				
National profiles on chemicals management have produced information in many countries with multi-sectoral and multi-stakeholder input. They provide an important baseline for future action.	Implementation gaps remain , even though concerted action has been taken through multi-lateral treaties on specific hazardous chemicals and issues of global concern.	The knowledge base on chemicals has been enhanced , among others through national inventories, hazard assessments, and Pollutant Release and Transfer Registers (PRTs).	The integrated approach to financing has mobilized significant resources, but it needs to be operationalized at national level.	Illegal international traffic of hazardous waste and counterfeit products remains an issue.

Source: UNEP; SAICM (2019b). SAICM – Factsheet.

While being a voluntary instrument, SAICM provided a crucial foundation for global cooperative action with defined targets⁵²². SAICM's scope was broad and did not specifically address marine plastic litter or microplastics – but there are plans to include the issue of microplastics in the negotiations for the post-2020 chemicals agenda of SAICM⁵²³.

With the end of SAICM's mandate, on 30 September 2023, the Global Framework on Chemicals - For a Planet Free of Harm from Chemicals and Waste (GFC) was adopted at the fifth ICCM (three years after the originally planned schedule), succeeding the previous strategy⁵²⁴. The GFC is supported by the Bonn Declaration – a political statement developed through extensive informal consultations –, which was also endorsed at ICCM-5.

Although the GFC does not address plastics directly within its 5 strategic objectives and 28 targets, in the Bonn Declaration States committed to

engage in the international efforts currently under way to establish a science policy panel to contribute further to the sound management of chemicals and waste and to prevent pollution, as well as to develop an international legally binding instrument on plastic pollution, including in the marine environment⁵²⁵.

⁵²¹ UNEP; SAICM (2019b). *Ob. cit.*, n.p.

⁵²² UNEP (2017a). *Ob. cit.*, p. 40.

⁵²³ *Ibid.*, p. 84.

⁵²⁴ UNEP (2023d). Global Framework on Chemicals – For a Planet Free of Harm from Chemicals and Waste. Available at: https://wedocs.unep.org/bitstream/handle/20.500.11822/46685/global_framework_chemicals_Planet_EN.pdf?sequence=1&isAllowed=y. Accessed on 12 December 2024.

⁵²⁵ Bonn Declaration, Paragraph 13. In: UNEP (2023c). Bonn Declaration for a Planet Free of Harm from Chemicals and Waste. High-level segment of the fifth session of the International Conference on Chemicals Management, on 28 and 29 September 2023, Bonn, Germany. Available at: https://wedocs.unep.org/bitstream/handle/20.500.11822/46686/Bonn_declaration_EN.pdf?sequence=1&isAllowed=y. Accessed on 17 December 2024.

The newly adopted GFC, however, is still relevant for combating plastic pollution. It is a comprehensive initiative that spans the entire chemical lifecycle, from products to waste, emphasising a “life cycle approach” and promoting responsible management, which allows flexibility for future instruments.

The GFC includes a range of objectives and targets focused on transparency and sustainability, offering important perspectives that can guide the ongoing discussions for a global LBI to eliminate plastic pollution⁵²⁶.

⁵²⁶ Carlini, G.; Azoulay, D.; Allary, C. (2024). Paving the Way to a Toxic-Free Planet: The New Global Framework on Chemicals – for a Planet Free of Harm from Chemicals and Waste. Center for International Environmental Law (CIEL), Blog Post, Published January 31, 2024. Available at: <https://www.ciel.org/global-framework-chemicals-toxic-free-planet/#:~:text=The%20Framework%20consists%20of%20five,lifecycle%2C%20including%20products%20and%20waste>. Accessed on 11 July 2024.

2.1.2 Further Commitments: Encouraging State Engagement and Emphasising the Urgency of the Issue

Expanding on the foundational legal and governance frameworks discussed earlier, this section delves into further commitments that seek to engage States and emphasise the urgency of addressing marine pollution, particularly plastic pollution. International efforts to tackle marine pollution are not limited to treaties and voluntary agreements alone; they are also deeply intertwined with global development goals and collaborative initiatives that aim to foster both political and public action.

In Subsection A “2.1.2.1”, the focus is centred in the Millennium Development Goals (MDGs) and the 2030 Agenda for Sustainable Development, with particular emphasis on SDG 14 – the goal dedicated to the health of the ocean. While the MDGs set the stage for international development efforts, the 2030 Agenda offers a more comprehensive framework, explicitly incorporating marine health and pollution reduction into global priorities. SDG 14, which concentrates on the sustainable use of the ocean and the reduction of marine pollution, including plastics, represents a critical commitment for achieving global environmental sustainability.

Thereafter, in Subsection B “2.1.2.2”, the discussion turns to several initiatives that seek to mobilise global action on marine pollution through cooperation, science, and shared knowledge. The Decade of Ocean Science for Sustainable Development, the Ocean Conferences, and the International Marine Debris Conferences provide significant platforms for advancing scientific research, policy discussions, and voluntary commitments from States. While these forums have proven instrumental in raising awareness and fostering collaboration, their non-binding nature and the varying levels of political and financial commitment underscore the need for stronger, enforceable actions to effectively combat marine plastic pollution.

Together, these commitments represent key mechanisms for engaging States, international organisations, and stakeholders in the collective fight against marine pollution. However, the urgency of the issue demands that these efforts be translated into more concrete and binding actions at all levels of governance.

2.1.2.1 Millennium Development Goals and the 2030 Agenda: towards a Holistic Approach?

The UN plays a prominent role when it comes to multilateral actions undertaken by States in order to converge diverse interests and needs. The UN continues to be a necessary reference for international legitimacy in a world that is more complex than the one that existed when the Organisation was created. The growth of common problems determines the omnipresence of multilateral organisations, with the UN being the most comprehensive and ambitious multilateral institution in existence, constituting a space for dialogue to identify issues on which the interests of States converge and then define possibilities for joint actions⁵²⁷.

In this sense, with regard to the Organisation's environmental agenda, the UNGA, back in 1983, approved and sponsored the creation of a special independent commission to deal with the environmental challenges that were already being presented to the world community at the time, called the World Commission on Environment and Development (WCED), which was chaired by the Norwegian Prime Minister Gro Harlem Brundtland. The Commission endeavoured to explore the causes of environmental degradation, trying to understand the interconnections between social equity, economic growth and environmental problems, seeking to develop policy solutions that integrated the three sectors⁵²⁸.

Even back then, scientists were warning of urgent and complex problems related to humanity's very survival: a warming globe, threats to the Earth's ozone layer, deserts consuming agricultural crops, among others⁵²⁹. In a clear demonstration of the widespread feeling of frustration and inadequacy in the international community⁵³⁰

⁵²⁷ Fonseca Junior, G. (2010). **El interés y la regla** – Multilateralismo y Naciones Unidas. Catarata: Madrid, p. 5-7. Colección Desarrollo y Cooperación. ISBN 978-84-8319-485-0.

⁵²⁸ Jarvie, M. E. (2016). **Brundtland Report**. Encyclopedia Britannica. Available at: <https://www.britannica.com/topic/Brundtland-Report>. Accessed on 13 April 2022.

⁵²⁹ WCED (1987). **Our Common Future** (Brundtland Report). Report of the World Commission on Environment and Development, from A/42/427. United Nations, Oslo, 20 March 1987. Available at: <https://sustainabledevelopment.un.org/content/documents/5987our-common-future.pdf>. Accessed on 02 April 2022.

⁵³⁰ In the Brundtland Report, it is possible to observe that the terms "international community" and "world community" are used interchangeably. The concept of international community has several definitions and gives rise to diverse discussions. As for its existence, for instance, supporters of the realist view of voluntarist or conservative orientation argue that it is impossible for a community to exist when States maintain their sovereignty, that is, it would be an antinomy. On the other hand, the sociological view argues that international law must necessarily reflect the deep sociological interests of this community, which pre-exists its own law. Other debates also reflect that the notion of international community is, in most cases, merely a mechanism to exclude those who are different from the members of the community – such as non-liberal States – and, basically, that this international community is constantly used for discriminatory

regarding its own ability to address vital global issues and deal with them effectively, the Brundtland Report provided the foundations and premises for the insertion of the concept of “sustainable development” in the preparation of several documents relevant to the environmental agenda, especially in the context of Eco-92, in which Agenda 21 was adopted⁵³¹.

The Agenda 21 was a non-binding action programme aimed at identifying the interventions needed to achieve sustainable development by addressing recommendations to States to regulate their behaviour in all relevant sectors⁵³². This agenda acknowledged the existential subjection of human beings to the biosphere, that is, to the set of ecosystems on the planet, in addition to disseminating new environmental values and diagnosing the environmental crisis that was already emerging:

Humanity stands at a defining moment in history. We are confronted with a perpetuation of disparities between and within nations, a worsening of poverty, hunger, ill health and illiteracy, and the continuing deterioration of the ecosystems on which we depend for our well-being. However, integration of environment and development concerns and greater attention to them will lead to the fulfilment of basic needs, improved living standards for all, better protected and managed ecosystems and a safer, more prosperous future. No nation can achieve this on its own; but together we can – in a global partnership for sustainable development⁵³³.

Since then, the notion that the use of natural resources must be linked to planned and responsible development has been promoted internationally, with the aim of

ideological purposes that, ultimately, favour the hegemony of the great powers. Despite this, it is understood that it is international law that produces the international community. The effects of globalization and fragmentation reinforce the complex nature of this society and the difficulty in giving it a clear and legible translation for all. The evolution of legal rationality shows a much more complex and multiple perception, and the international community should be understood as one in which the individual, and not the sovereign State, is the objective and the final beneficiary of international law. The international community is the reflection of a contemporary legal and social rationality that remains complex and multiple. Fundamental rights, broadly encompassing the right to peace and the right to a healthy environment, can be seen as the unifying principles of an emerging international community, coordinating distinct legal systems, fragmented partial legal orders and diverse cultures. Multilateralism necessarily emerges from the idea of a plural international community and should be seen as an essential prerequisite for any decision-making that affects the international community. The pluralism of legal systems, orders and cultures directly requires multilateralism as the preferred mode of action in international relations. Objectively, therefore, for the purposes of this research, when “international community” is mentioned, it refers to the Member States of the UN. In: Jouannet, E. (2005). *La Communauté Internationale vue par les Juristes. Annuaire Français de Relations Internationales (AFRI)*, vol. VI, p. 16-23. Centre Thucydide – Analyse et recherche en relations internationales (Université Paris II Panthéon-Assas). Available at: https://www.afri-ct.org/wp-content/uploads/2006/06/AFRI2005_jouannet.pdf. Accessed on 12 December 2021.

⁵³¹ Japiassú, C.E.; Guerra, I.F. (2017). *30 anos do relatório Brundtland: nosso futuro comum e o desenvolvimento sustentável como diretriz constitucional brasileira*. *Revista de Direito da Cidade*, vol. 9, n. 4. Available at: <https://www.e-publicacoes.uerj.br/index.php/rdc/article/view/30287/23220>. Accessed on 19 December 2021.

⁵³² Marchisio, S. (2017). *Il diritto internazionale dell'ambiente*. In: *Diritto Ambientale - Profili Internazionali, europei e comparati*. Terza edizione (eds. Giovanni Cordini, Paolo Fois, Sergio Marchisio). G. Giappichelli Editore, p. 13.

⁵³³ Agenda 21, Chapter 1 – Preamble, Paragraph 1.1. In: UN (1992a). *Ob. cit.*, n.p.

preventing and reducing the occurrence of environmental impacts. This announces the concept of sustainability⁵³⁴, which is linked to the continuity of human life, encompassing economic, social, cultural and environmental aspects of society⁵³⁵. Sustainable development, consequently, is considered as development that meets the needs of the present without harming the ability of future generations to meet their own demands⁵³⁶.

Following the 1992 UNCED and Agenda 21, in 2000, at the UN Millennium Summit, the next step was the unanimous adoption of the United Nations Millennium Declaration⁵³⁷, pledging to form a global partnership aimed at reducing poverty through eight goals, with a deadline set for 2015. The beginning of a new millennium represented a unique opportunity to create a new strategy, adapted to the latest realities and needs of the world in the twenty-first century. Therefore, the UNGA decided to consolidate the outcomes of previous environmental conferences and presented them at the Millennium Summit⁵³⁸.

An independent advisory board led a taskforce of over 250 experts from across the globe – including scientists, development practitioners, parliamentarians, policymakers, and representatives from civil society, UN agencies, the World Bank, the

⁵³⁴ Sustainable development is not to be confused with sustainability. Sustainable development is the method to achieve sustainability. In: Leite, J.R.M.; Belchior, G.P.N. (2010). *O Estado de Direito Ambiental e a particularidade de uma hermenêutica jurídica*. **Revista Sequência**, vol. 31 n. 60, p. 291-318. UFSC, Florianópolis, SC, Brasil, ISSN 2177-7055. DOI:10.5007/2177-7055.2010v31n60p291. Available at: <https://periodicos.ufsc.br/index.php/sequencia/article/view/2177-7055.2010v31n60p291/15075>. Accessed on 20 December 2021.

⁵³⁵ Leite, J.R.M.; Belchior, G.P.N. (2010). *Ob. cit.*, p. 291-318.

⁵³⁶ Ferreira, H.S. (2012). *Do desenvolvimento ao desenvolvimento sustentável: um dos desafios lançados ao Estado de Direito Ambiental na sociedade de risco*. In: **Repensando o Estado de Direito Ambiental**. Organização: José Rubens Morato Leite, Helene Sivini Ferreira, Matheus Almeida Caetano. Florianópolis: Fundação Boiteux. Pensando o Direito no Século XXI; vol. 3, p. 131. ISBN: 978-85-7840-067-5. Available at: https://repositorio.ufsc.br/bitstream/handle/123456789/99623/VD_Repensando-Estado-FINAL-25-07-2012.pdf?sequence=1&isAllowed=y. Accessed on 07 December 2021.

⁵³⁷ UNGA (2000). 55/2. United Nations Millennium Declaration. Resolution adopted by the General Assembly (A/RES/55/2). Fifty-fifth session Agenda item 60 (b), 18 September 2000. Available at: <https://documents.un.org/doc/undoc/gen/n00/559/51/pdf/n0055951.pdf>. Accessed on 13 May 2023.

⁵³⁸ The 1990s was a decade marked by significant UN conferences and summits. It began with the World Summit for Children (New York, 1990) and was followed by the UNCED (Rio de Janeiro, 1992), the International Conference on Population and Development (Cairo, 1994), the World Summit on Social Development (Copenhagen, 1995), the Fourth World Conference on Women (Beijing, 1995), the Second United Nations Conference on Human Settlements (Istanbul, 1996), and the World Food Summit (Rome, 1996). Each of these conferences or summits resulted in the adoption of comprehensive action plans. Additionally, the UNCED introduced legally binding conventions such as the CBD and the United Nations Framework Convention on Climate Change (UNFCCC). In the same decade, two more legally binding agreements were approved: the United Nations Convention to Combat Desertification (UNCCD, 1994) and the UNFSA of 1995. In: Dodds, F.; Donoghue, D.; Roesch, J.L. (2017). **Negotiating the Sustainable Development Goals: A transformational agenda for an insecure world**. London; New York: Routledge, p. 5-6. ISBN 9781138695078.

IMF, and the private sector – and presented its recommendations to the UN Secretary-General⁵³⁹.

The link between environmental and development issues was made explicit in the UN Millennium Declaration, which declared the integration of sustainable development principles into national policies and programmes. It was not until August 2001 that UNDP, along with other UN departments, the OECD, and the World Bank, collaborated to establish the eight Millennium Development Goals (MDGs) and their twenty-one measurable targets (and later, sixty indicators)⁵⁴⁰. Thus, in September 2001, building on the Millennium Declaration, the UN introduced the MDGs as a set of shared objectives for the global community to accomplish⁵⁴¹.

The eight MDGs – with their specific targets – were dedicated to: 1) eradicate extreme poverty and hunger; 2) achieve universal primary education; 3) promote gender equality and empower women; 4) reduce child mortality; 5) improve maternal health; 6) combat HIV/AIDS, malaria and other diseases; 7) ensure environmental sustainability; 8) develop a global partnership for development⁵⁴².

Since then, significant progress has been made toward achieving the MDGs. However, the achievement of the goals and respective targets has been limited and uneven across countries. The literature discusses various reasons for the gaps in progress, with UN Secretary-General Ban Ki-Moon recognising that “*progress has been uneven among regions and between and within countries*”⁵⁴³ and attributing these shortfalls to “*unmet commitments, inadequate resources and a lack of focus and accountability*”⁵⁴⁴.

The MDGs have faced severe criticism, especially for the failure to address equity, gender issues, the lack of strong targets and disparities between nations. For some, the

⁵³⁹ UN Millennium Project (2005). Who’s got the power? Transforming health systems for women and children. Task Force on Child Health and Maternal Health – Achieving the Millennium Development Goals. Available at: <https://digitallibrary.un.org/record/556101?ln=en>. Accessed on 17 May 2023.

⁵⁴⁰ Dodds, F.; Donoghue, D.; Roesch, J.L. (2017). *Ob. cit.*, p. 6.

⁵⁴¹ UNGA (2001). Road map towards the implementation of the United Nations Millennium Declaration. Fifty-sixth session Item 40 of the provisional agenda* Follow-up to the outcome of the Millennium Summit. Report of the Secretary-General (A/56/326). Available at: <https://www.un.org/millenniumgoals/sgreport2001.pdf>. Accessed on 11 May 2023.

⁵⁴² UN (2000). Millennium Summit, 6-8 September 2000, New York. Background – Development goals for a new millennium. Available at: <https://www.un.org/en/conferences/environment/newyork2000>. Accessed on 13 May 2023.

⁵⁴³ “Keeping the Promise” Report, Paragraph 20. In: UNGA (2010). 65/1. Keeping the promise: united to achieve the Millennium Development Goal. Resolution adopted by the General Assembly on 22 September 2010 (A/RES/65/1). Available at: <https://digitallibrary.un.org/record/692292?v=pdf>. Accessed on 21 May 2023.

⁵⁴⁴ UN (2010). Remarks to Member States on “Keeping the Promise: a Forward-looking Review to Promote and Agreed Action Agenda to Achieve the MDGs by 2015”. Speech given by Secretary General Ban Ki-moon, General Assembly, 16 March 2010. Available at: <https://www.un.org/sg/en/content/sg/speeches/2010-03-16/remarks-member-states-keeping-promise-forward-looking-review-promote>. Accessed on 21 May 2023.

inability to fully achieve the MDGs stems from the way the goals were designed. Besides, many criticise the MDG framework for advocating “*quick-fix*” solutions and short-term planning, rather than focusing on sustainable global management objectives and long-term structural changes⁵⁴⁵.

The UN Task Team on the post-2015 UN Development Agenda has also recognised that key issues, such as inequalities, social exclusion, biodiversity, and reproductive health, were inadequately addressed by the MDGs. In their recommendations, the Task Team emphasised human rights, equality, and sustainability as fundamental values for future goals⁵⁴⁶. Nevertheless, there is yet a broad consensus that the MDGs have made a significant impact in some areas, by addressing poverty, hunger, and disease globally⁵⁴⁷.

In 2012, twelve years after the adoption of the MDGs, the UN Conference on Sustainable Development (Rio+20) took place with two main themes: how to develop a green economy and the institutional framework for sustainable development⁵⁴⁸. At Rio+20 the declaration “The Future We Want” was adopted, which lists a series of suggestions and measures for high-, middle- and low-income countries to consider implementing the principles of sustainable development in reality. In this regard, in the Preamble the Heads of State and Government and high-level representatives state that they

(...) recognize that each country faces specific challenges to achieve sustainable development, and we underscore the special challenges facing the most vulnerable countries and, in particular, African countries, least developed countries, landlocked developing countries and small island developing States, as well as the specific challenges facing the middle-income countries. Countries in situations of conflict also need special attention⁵⁴⁹.

⁵⁴⁵ Fehling, M.; Nelson, B. D.; Venkatapuram, S. (2013). Limitations of the Millennium Development Goals: a literature review. **Global Public Health**, vol. 8, n. 10, p. 1110-1117. DOI: <https://doi.org/10.1080/17441692.2013.845676>. Available at: <https://www.tandfonline.com/doi/full/10.1080/17441692.2013.845676>. Accessed on 3 April 2023.

⁵⁴⁶ UN Task Team (2012). **Realizing the Future We Want for All**: Report to the Secretary-General. UN System Task Team on the Post-2015 UN Development Agenda, New York, June 2012, p. 22. Available at: https://www.un.org/en/development/desa/policy/untaskteam_undf/untt_report.pdf. Accessed on 12 April 2023.

⁵⁴⁷ Servaes, J. (2017). Introduction: From MDGs to SDGs. In: **Sustainable Development Goals in the Asian Context**. Communication, Culture and Change in Asia, vol 2, p. 9. Servaes, J. (eds), Springer, Singapore. DOI: https://doi.org/10.1007/978-981-10-2815-1_1. Available at: https://link.springer.com/chapter/10.1007/978-981-10-2815-1_1. Accessed on 20 May 2023.

⁵⁴⁸ Pisano, U.; Endl, A.; Berger, G. (2012). The Rio+20 Conference 2012: Objectives, processes and outcomes. European Sustainable Development Network (ESDN) Quarterly Report N°25. Available at: https://www.esdn.eu/fileadmin/ESDN_Reports/2012-June-The_Rio_20_Conference_2012.pdf. Accessed on 8 April 2023.

⁵⁴⁹ The Future We Want, paragraph 32. In: UN (2012). The Future We Want. Outcome document of the United Nations Conference on Sustainable Development Rio de Janeiro, Brazil, 20–22 June 2012. Available at: <https://sustainabledevelopment.un.org/content/documents/733FutureWeWant.pdf>. Accessed on 2 April 2023.

In Rio de Janeiro, it was also decided to initiate the process of evolving the MDGs into a set of Sustainable Development Goals (SDGs)⁵⁵⁰ and to organise the United Nations High-Level Political Forum on Sustainable Development (HLPF)⁵⁵¹ – whose format and organisational aspects are outlined in Resolution 67/290⁵⁵². The Forum’s inaugural meeting took place on 24 September 2013⁵⁵³, replacing the Commission on Sustainable Development⁵⁵⁴, which had convened annually since 1993.

Consequently, building on the achievements of the MDGs, the SDGs present an ambitious set of universal “zero” goals and targets to be met worldwide by 2030. The SDGs, however, go beyond the MDGs⁵⁵⁵ – especially because the SDGs are universally applicable to all countries, eliminating the “developing” versus “developed” division that exposed the MDGs to criticism⁵⁵⁶.

During the first session of the United Nations Environment Assembly (UNEA-1), in 2014, the Ministers of Environment and Heads of Delegation called on the international community and reaffirmed their commitment to “*achieve an ambitious, universal, implementable and realizable Post-2015 Development Agenda*”, which could completely integrate “*the economic, social and environmental dimensions of sustainable development in a coherent, holistic, comprehensive and balanced manner*”⁵⁵⁷.

It is worth noting that the process of developing the SDGs was vastly different from that of the MDGs, and involved a broader range of political actors, with an intergovernmental discussion spanning three years. The goal of this new approach was

⁵⁵⁰ UNDP (2015). Background on the goals. Sustainable Development Goals. Available at: <https://www.undp.org/sdg-accelerator/background-goals>. Accessed on 3 April 2023.

⁵⁵¹ UN (2012). *Ob. cit.*, p. 22.

⁵⁵² UNGA (2013). 67/290. Format and organizational aspects of the high-level political forum on sustainable development. Resolution adopted by the General Assembly on 9 July 2013 (A/RES/67/290). Available at: <https://documents.un.org/doc/undoc/gen/n12/496/00/pdf/n1249600.pdf>. Accessed on 17 May 2023.

⁵⁵³ IISD (2013). Summary of the First Meeting of the High-Level Political Forum on Sustainable Development: 24 September 2013. Earth Negotiations Bulletin, vol. 33, n. 1. Published by the International Institute for Sustainable Development (IISD). Available at: <https://enb.iisd.org/events/final-session-un-csd-and-hlpf-inaugural-session/summary-report-24-september-2013>. Accessed on 12 May 2023.

⁵⁵⁴ As decided in the document “The Future We Want”, in its paragraph 84: “*We decide to establish a universal, intergovernmental, high-level political forum, building on the strengths, experiences, resources and inclusive participation modalities of the Commission on Sustainable Development, and subsequently replacing the Commission*”.

⁵⁵⁵ Servaes, J. (2017). *Ob. cit.*, p. 13.

⁵⁵⁶ Woodbridge, M. (2015). From MDGs to SDGs: What are the Sustainable Development Goals? ICLEI BRIEFING SHEET - Urban Issues, No. 01. Available at: <https://www.local2030.org/library/251/From-MDGs-to-SDGs-What-are-the-Sustainable-Development-Goals.pdf>. Accessed on 18 May 2023.

⁵⁵⁷ UNEA (2014). Ministerial Outcome Document of the First Session of the United Nations Environment Assembly of the United Nations Environment Programme. Available at: https://www.bmu.de/fileadmin/Daten_BMU/Download_PDF/Europa___International/unea_ministerial_outcome_document_en_bf.pdf. Accessed on 12 May 2023.

primarily to ensure greater involvement from Member States and civil society, which also collaborates to explain the higher number and increased complexity of the SDGs, as achieving consensus was essential⁵⁵⁸.

After this long process, from 25 to 27 September 2015, the UN hosted a Summit on Sustainable Development⁵⁵⁹. This three-day event marked an unprecedented gathering, with 150 heads of State endorsing the 2030 Agenda for Sustainable Development. The Summit represented the initial step in translating the new vision into coordinated action. The principles of “*leaving no one behind and reaching those who are the farthest away*” resonated throughout the General Assembly Hall. All 193 countries that spoke expressed a strong sense of ownership in this new – non-binding – programme of action⁵⁶⁰.

The newly adopted universal framework, comprising 17 goals, 169 targets, and 304 indicators, succeeds the MDGs. While the SDGs share certain structural similarities with the MDGs – both being international development agendas spanning a 15-year period – they represent a significant expansion in scope and content compared to their predecessors⁵⁶¹. The SDGs’ aim is to transcend the fragmentation of technical and policy initiatives by promoting integrated approaches to the interconnected economic, social, and environmental challenges that the planet is facing⁵⁶².

The new goals presented in the Resolution “Transforming our world: the 2030 Agenda for Sustainable Development” thus, are dedicated to: 1) End poverty in all its forms everywhere; 2) End hunger, achieve food security and improved nutrition and promote sustainable agriculture; 3) Ensure healthy lives and promote well-being for all at all ages; 4) Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all; 5) Achieve gender equality and empower all women and girls; 6) Ensure availability and sustainable management of water and sanitation for all; 7) Ensure access to affordable, reliable, sustainable and modern energy for all; 8) Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all; 9) Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation; 10) Reduce inequality within and among countries; 11) Make cities and human settlements inclusive, safe, resilient and

⁵⁵⁸ Dodds, F.; Donoghue, D.; Roesch, J.L. (2017). *Ob. cit.*, p. 24-75.

⁵⁵⁹ UN (2015b). United Nations Summit on Sustainable Development, 25-27 September 2015, New York. Available at: <https://www.un.org/en/conferences/environment/newyork2015>. Accessed on 02 May 2023.

⁵⁶⁰ Dodds, F.; Donoghue, D.; Roesch, J.L. (2017). *Ob. cit.*, p. 121.

⁵⁶¹ Woodbridge, M. (2015). *Ob. cit.*, p. 2.

⁵⁶² Servaes, J. (2017). *Ob. cit.*, p. 9.

sustainable; 12) Ensure sustainable consumption and production patterns; 13) Take urgent action to combat climate change and its impacts; 14) Conserve and sustainably use the oceans, seas and marine resources for sustainable development; 15) Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss; 16) Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels; and 17) Strengthen the means of implementation and revitalise the Global Partnership for Sustainable Development⁵⁶³.

From the observation of the goals, it is possible to recognise that the 2030 Agenda brought innovations to the ocean agenda, as the MDGs did not specifically address this issue – they did not specifically refer to concerns about the situation of the ocean⁵⁶⁴. Structurally, the SDGs refer to three categories of goals by: i) consolidating an extension of the MDGs, which includes the first seven SDGs (no poverty, zero hunger and sustainable agriculture, good health and well-being, quality education, gender equality, clean water and sanitation, affordable and clean energy); ii) reflecting on inclusion measures (decent work and economic growth, industry, innovation and infrastructure, reduction of inequalities); and iii) addressing contemporary sustainability issues that encompass the themes of sustainable cities and communities, responsible consumption and production, action against global climate change, life below water, life on land, peace, justice and effective institutions and partnerships and means of implementation⁵⁶⁵.

In the 2030 Agenda, Member States demonstrate their determination to mobilise the means necessary to implement these goals and targets through a revitalised global partnership for sustainable development, based on a spirit of strengthened global solidarity, with a particular focus on the needs of the most vulnerable people. The Agenda and its 17 SDGs have unprecedented scope and significance, being accepted by all countries and taking into account the different realities, capacities, levels of national development, in addition to respecting domestic policies and priorities⁵⁶⁶.

⁵⁶³ UNGA (2015). *Ob. cit.*, n.p.

⁵⁶⁴ When dealing with the environment, the MDGs limited themselves to mentioning, in a vague and comprehensive way, the effort to “Protecting our common environment” or the “Respect for nature”. In: UNGA (2000). *Ob. cit.*, p. 2-6.

⁵⁶⁵ Kumar, S.; Kumar, N.; Vivekadhish, S. (2016). Millennium Development Goals (MDGs) to Sustainable Development Goals (SDGs): Addressing Unfinished Agenda and Strengthening Sustainable Development and Partnership. **Indian Journal of Community Medicine**, vol. 41, n. 1, p. 2. Available at: <https://pmc.ncbi.nlm.nih.gov/articles/PMC4746946/pdf/IJCM-41-1.pdf>. Accessed on 16 May 2023.

⁵⁶⁶ UNGA (2015). *Ob. cit.*, n.p.

It should be noted, however, that although the 2030 Agenda and the SDGs are not legally binding, they are in fact part of a logic of political engagement by States and facilitate the adoption of strategies for planning and implementing public policies. For this reason, they may become binding once they are included in political agendas or provided for in local, national or regional public policies⁵⁶⁷.

As a *sui generis* legal framework, the 2030 Agenda is characterised by its broad scope and non-binding nature. It blends extensive coverage of global issues with the flexibility of not being legally enforceable, which distinguishes it from more traditional, binding legal agreements⁵⁶⁸. Under international law, to be precise, there is no question that Agenda 2030 does not qualify as a treaty. Firstly, it does not meet the criteria of the Vienna Convention on the Law of Treaties (VCLT):

1. For the purposes of the present Convention: (a) “treaty” means an international agreement concluded between States in written form and governed by international law, whether embodied in a single instrument or in two or more related instruments and whatever its particular designation; (...)⁵⁶⁹.

The 2030 Agenda, instead, was not “*concluded between States*”, but rather was mandated by the Resolution 70/1 of the UNGA. Accordingly, Articles 10 to 17 of the UN Charter do not grant the UNGA the authority to adopt binding international legal documents. In line with Article 13 of the Charter:

1. The General Assembly shall initiate studies and make recommendations for the purpose of:
a. promoting international co-operation in the political field and encouraging the progressive development of international law and its codification;
b. promoting international co-operation in the economic, social, cultural, educational, and health fields, and assisting in the realization of human rights and fundamental freedoms for all without distinction as to race, sex, language, or religion. (...)⁵⁷⁰.

⁵⁶⁷ Silva, S.T.; Leuzinger, M.D. (2019). *Os desafios de criação e gestão das áreas marinhas protegidas no Brasil à luz dos objetivos do desenvolvimento sustentável*. In: Mont'alverne, T.F., Silva, S. T.; Oliveira, C.C.; Galindo, G.R.B. **Meio Ambiente Marinho, Sustentabilidade e Direito vol. I – A conservação e a preservação dos recursos marinhos na zona costeira, na plataforma continental e nos fundos marinhos**. Rio de Janeiro: Lumen Juris, p. 121-148. ISBN: 978-85-519-1465-6.

⁵⁶⁸ Rabinovych, M. (2020). Legal Status and Effects of the Agenda 2030 Within the EU Legal Order. **Journal of Contemporary European Research**, vol. 16, n. 2, p. 190. DOI: <https://doi.org/10.30950/jcer.v16i2.1071>. Available at: <https://www.jcer.net/index.php/jcer/article/view/1071#:~:text=It%20is%20found%20that%2C%20despite,does%20not%20enjoy%20direct%20effect>. Accessed on 12 May 2023.

⁵⁶⁹ Vienna Convention on the Law of Treaties, Article 2.

⁵⁷⁰ UN (1945). Charter of the United Nations. San Francisco, 26 June 1945. Entry into force on 24 October 1945. Available at: <https://www.un.org/en/about-us/un-charter/full-text>. Accessed on 12 February 2022.

Moreover, the non-legally binding nature of the 2030 Agenda can be further explained by the fact that its implementation involves not only States – the traditional subjects of international law –, but also cities, businesses, and NGOs. These actors have aligned with the SDGs, taking on various responsibilities such as cities creating financing and planning avenues at the subnational level, while NGOs typically serve as “supervisors”, holding governments accountable for their SDG commitments⁵⁷¹.

This illustrates that the rigid structure of international treaty law, which limits parties to those recognised under international law, would conflict with the universal scope of Agenda 2030 and the emphasis on multi-stakeholder partnerships for its implementation. However, the 2030 Agenda does have connections to international law in various ways⁵⁷². Notably, it reaffirms States’ obligations in certain areas of international law, such as the conservation of coastal and marine ecosystems (SDG 14, target 14.5⁵⁷³), sustainable ocean resource use (SDG 15, target 14c⁵⁷⁴), and labour rights such as freedom of association and collective bargaining (SDG 8, target 8, indicator 8.8.2⁵⁷⁵).

Additionally, some targets and indicators within Agenda 2030 are linked to specific binding international legal instruments, such as the UNFCCC – especially SDG 13, which explicitly acknowledges that “*the United Nations Framework Convention on Climate Change is the primary international, intergovernmental forum for negotiating the global response to climate change*”⁵⁷⁶. The SDGs and their targets, consequently, are most effectively understood as part of the larger framework of existing intergovernmental commitments. The natural alignment between the SDGs and international law reflects a

⁵⁷¹ Hege, E.; Demailly, D. (2017). How do NGOs mobilize around the SDGs and what are the ways forward? A French-German comparison. Institute for Sustainable Development and International Relations (IDDRI) Working Paper, p. 5. Available at: https://www.iddri.org/sites/default/files/import/publications/working-paper-sdgs-and-ngos_eh-dd.pdf. Accessed on 12 May 2023.

⁵⁷² Rabinovych, M. (2020). *Ob. cit.*, p. 189.

⁵⁷³ “By 2020, conserve at least 10 per cent of coastal and marine areas, consistent with national and international law and based on the best available scientific information.”

⁵⁷⁴ “Enhance the conservation and sustainable use of oceans and their resources by implementing international law as reflected in United Nations Convention on the Law of the Sea, which provides the legal framework for the conservation and sustainable use of oceans and their resources, as recalled in paragraph 158 of ‘The future we want’.”

⁵⁷⁵ “Level of national compliance with labour rights (freedom of association and collective bargaining) based on International Labour Organization (ILO) textual sources and national legislation, by sex and migrant status.”

⁵⁷⁶ ECOSOC (2016). Report of the Inter-Agency and Expert Group on Sustainable Development Goal Indicators – Note by the Secretary-General. Statistical Commission Forty-seventh session 8-11 March 2016 Item 3 (a) of the provisional agenda** Items for discussion and decision: data and indicators for the 2030 Sustainable Development Agenda (E/CN.3/2016/2/Rev.1*). Available at: <https://unstats.un.org/unsd/statcom/47th-session/documents/2016-2-iaeg-sdgs-rev1-e.pdf>. Accessed on 18 April 2023.

mutual dedication to combining both strategies in order to advance sustainable development⁵⁷⁷.

Moreover, some targets in the Agenda, such as those related to the environment and biodiversity conservation, reflect certain international treaties, though the Agenda does not explicitly reference them. On a broader level, the 2030 Agenda emphasises that the SDGs were established and should be “*implemented in a manner that is consistent with the rights and obligations of States under international law*”⁵⁷⁸.

This suggests that the true impact of the 2030 Agenda on international law will largely depend on its implementation by States and international organisations. While it only directly references certain areas of international law and treaties, the 2030 Agenda does not aim to enforce compliance with these treaties. However, its flexible and broad framework allows States and international organisations to use it – alongside global governance institutions – as a platform to strengthen the implementation and coordination of international treaties for sustainable development⁵⁷⁹.

Beyond that, the 17 SDGs provided by the 2030 Agenda are interconnected and cannot function in isolation, as each goal can influence others and be influenced in return. This creates a significant cause-and-effect relationship among the goals, which should not be overlooked⁵⁸⁰. Despite this horizontal nature of the SDGs, that is, they are not assigned any hierarchy or priority for implementation, it is essential to emphasise that SDG 14 – “Life below water” presents itself as a central objective.

The ocean and its resources are increasingly recognised as indispensable for meeting the multiple challenges that the planet is already facing and will face in the coming decades. By the middle of this century, sufficient food, jobs, energy, raw materials and economic growth will be needed to sustain a likely population level of between 9 and 10 billion inhabitants. The potential of the ocean to help meet these requirements is enormous, but taking full advantage of it will require a substantial expansion of many economic activities based on this ecosystem. This will be challenging,

⁵⁷⁷ Kim, R.E. (2016). The Nexus between International Law and the Sustainable Development Goals. **RECIEL - Review of European, Comparative & International Environmental Law**, vol. 25, n. 1, p. 16. DOI: <https://doi.org/10.1111/reel.12148>. Available at: <https://onlinelibrary.wiley.com/doi/epdf/10.1111/reel.12148>. Accessed on 17 April 2023.

⁵⁷⁸ Resolution 70/1. Transforming our world, paragraph 18.

⁵⁷⁹ Rabinovych, M. (2020). *Ob. cit.*, p. 189

⁵⁸⁰ Kumar, P.; *et al.* (2018). Determination of hierarchical relationships among sustainable development goals using interpretive structural modeling. **Environment, Development and Sustainability**, vol. 20, p. 2120. DOI: <https://doi.org/10.1007/s10668-017-9981-1>. Available at: <https://link.springer.com/article/10.1007/s10668-017-9981-1>. Accessed on 22 May 2023.

because the sea is already under stress from overexploitation, pollution, biodiversity decline and climate change⁵⁸¹.

In fact, the ocean faces critical issues such as eutrophication, acidification, declining fish populations, rising temperatures, and pervasive pollution. These challenges degrade habitats, reduce biodiversity, and pose risks to coastal communities and marine ecosystems, which support over 3 billion people. The efforts to address these growing problems, however, remain inconsistent and uneven⁵⁸².

Annual plastic production currently stands at 422 million tons, expected to reach 661 million tons by 2025 and surpass one billion tons by 2050. Approximately 10% of this plastic enters aquatic systems, making up 90% of oceanic solid waste, totalling over 5 trillion pieces. Such level of plastic pollution in the ocean is strongly linked to human activities and their scale⁵⁸³.

In the context of the 2030 Agenda, nevertheless, marine plastic pollution has only been acknowledged within the framework of SDG 14, specifically under the target 14.1, which seeks to, by the deadline of 2025, “*prevent and significantly reduce marine pollution of all kinds, in particular from land-based activities, including marine debris and nutrient pollution*”. This should be measured by indicator 14.1.1 “*(a) index of coastal eutrophication; and (b) plastic debris density*”⁵⁸⁴.

This shows that the international community recognises the reduction in the density of floating plastic debris as essential to the sustainable use of the ocean – even though there is still no universally accepted index for measuring the density of floating plastic debris⁵⁸⁵.

It is evident, hence, that the ocean plays a pivotal role in achieving sustainable development for society. Many SDGs cannot be fully achieved without addressing SDG 14 (Fig. 16). For example, SDG 14 aims to end overfishing and illegal practices, which

⁵⁸¹ OECD (2016). *Ob. cit.*, p. 18.

⁵⁸² UN (2024). The Sustainable Development Goals Report. United Nations publication issued by the Department of Economic and Social Affairs (DESA), p. 36. ISBN 978-92-1-003135-6. Available at: <https://unstats.un.org/sdgs/report/2024/The-Sustainable-Development-Goals-Report-2024.pdf>. Accessed on 05 January 2025.

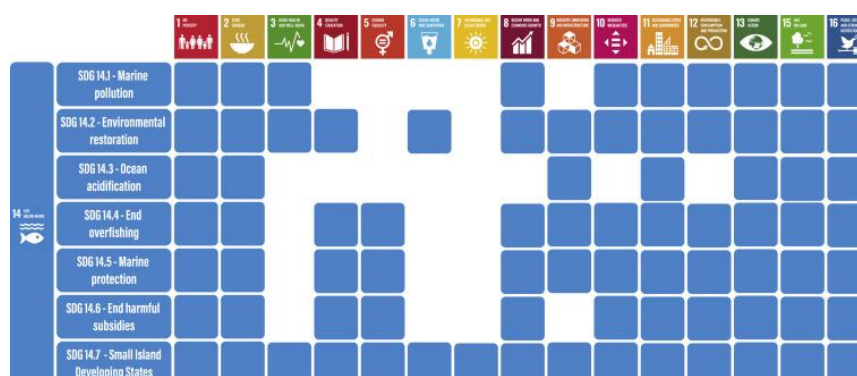
⁵⁸³ Hajji, A.L.; Lucas, K.N. (2024). Anthropogenic stressors and the marine environment: From sources and impacts to solutions and mitigation. **Marine Pollution Bulletin**, vol. 205, p. 2. DOI: <https://doi.org/10.1016/j.marpolbul.2024.116557>. Available at: <https://www.sciencedirect.com/science/article/pii/S0025326X24005344>. Accessed on 18 November 2024.

⁵⁸⁴ SDG 14 – Conserve and sustainably use the oceans, seas and marine resources for sustainable development, Target 14.1, Indicator 14.1.1.

⁵⁸⁵ Walker, T.R. (2021). (Micro)plastics and the UN Sustainable Development Goals. **Current Opinion in Green and Sustainable Chemistry**, vol. 30, p. 1. DOI: <https://doi.org/10.1016/j.cogsc.2021.100497>. Available at: <https://www.sciencedirect.com/science/article/pii/S2452223621000535#:~:text=Goal%2014.,i.e.%20plastics%20%3C5%20mm>). Accessed on 03 November 2022.

are crucial for fulfilling other goals such as no poverty (SDG 1), zero hunger (SDG 2), good health and well-being (SDG 3), and reducing inequalities (SDG 10):

Figure 17 – Contribution of Ocean Targets to the other SDGs⁵⁸⁶



Source: Claudet, J.; *et. al.* (2020). A Roadmap for Using the UN Decade of Ocean Science for Sustainable Development in Support of Science, Policy, and Action.

Figure 17 provides insights on how the ocean, and its resources are increasingly recognised as indispensable for addressing the multiple challenges that humanity – is already facing and – will face in the coming years, with regard to the eradication of poverty (SDG 1) and the generation of decent jobs and economic development (SDG 8).

It is not enough, however, to observe the quantitative relationships between SDG 14 and the other goals, but it is worth to analyse their qualitative relationships. The ocean provides numerous ecosystem services⁵⁸⁷, which can be understood as benefits that people obtain from the environment.

Some examples are regulatory and supporting ecosystem services, such as the distribution of heat around the planet, the functioning of the hydrological cycle and the absorption of carbon dioxide (CO₂) as part of the carbon cycle. Other ecosystem services are obtained as a result of human activity to acquire them, such as obtaining food provided by capture fisheries, providing significant quantities of the protein needed to feed the world's population. If such human activities are not carefully managed to maintain

⁵⁸⁶ Blue-coloured blocks indicate identified potential co-benefits between achieving the ocean targets and other SDGs. In: Claudet, J.; *et. al.* (2020). A Roadmap for Using the UN Decade of Ocean Science for Sustainable Development in Support of Science, Policy, and Action. **One Earth**, vol. 2, n. 1, p. 36. DOI: <https://doi.org/10.1016/j.oneear.2019.10.012>. Available at: <https://www.sciencedirect.com/science/article/pii/S2590332219300934>. Accessed on 28 December 2021.

⁵⁸⁷ Ecosystem services, or environmental services, can be defined as flows originating from natural capital stocks that combine with human services capital to provide well-being to populations. These services can be classified into four categories: cultural services (aesthetic and recreational elements); regulatory services (which regulate the climate, the floods, the pests and water purification, for instance); support services (nutrient cycling and soil formation); and provision services (such as the supply of food, fresh water, fiber and fuels). In: Nusdeo, A.M.O. (2016). *Pagamento por Serviços Ambientais. Direito Ambiental e Sustentabilidade*. Eds. Arlindo Philippi Jr., Vladimir Passos de Freitas, Ana Luiza Silva Spíndola. Barueri, SP: Manole, 2016. Coleção Ambiental, vol. 18, p. 619-643. ISBN 978-85-204-3922-7.

ecosystem structure and function, the acquisition of such ecosystem services may result in damage to the marine environment and the reduction or loss of these fundamental services⁵⁸⁸.

Hence the need to ensure that the implementation of the SDGs is carried out in a systemic manner, observing the interconnections qualitatively: preventing and reducing marine pollution (target 14.1), as well as protecting and restoring ecosystems (target 14.2) which is related to ensuring clean water and sanitation (SDG 6) that provide good health and well-being (SDG 3), with the substantial reduction in the number of deaths and illnesses caused by hazardous chemicals, contamination and water pollution (SDG 3).

In the same sense, the implementation of integrated water resources management at all levels (SDG 5) and the sustainable and efficient management of natural resources (SDG 12) can ensure the conservation and sustainable use of the ocean, seas and marine resources for sustainable development⁵⁸⁹.

In fact, global challenges – many of which are addressed by the SDGs – are increasingly interconnected. Yet, the responses to them remain fragmented. This lack of cohesion leads to various risks and negative outcomes⁵⁹⁰.

Despite the fragmentation of international environmental law, the Agenda 2030 in fact adopts an integrated approach between the different environmental agendas, establishing interesting connections between the various aspects of sustainable development⁵⁹¹.

The promotion of such an integrated approach, however, does not mean that States implement the SDGs in a uniform manner. On the contrary, there are very different levels of progress for each SDG. On average, only 16% of SDG targets are projected to be achieved by 2030. The remaining 84% show either limited progress or a decline in progress. Global progress on the SDGs has stagnated since 2020, with a slower pace even before the pandemic and other crises. Moreover, there is a significant variation in SDG performance across countries: SDGs 2 (Zero Hunger), 11 (Sustainable Cities), 14 (Life Below Water), 15 (Life on Land), and 16 (Peace and Justice) are particularly off track,

⁵⁸⁸ UNEP (2016g). **The First Global Integrated Marine Assessment**: World Ocean Assessment. The Group of Experts of the Regular Process. Lorna Inniss and Alan Simcock (Joint Coordinators) Amanuel Yoanes Ajawin; *et. al.* Available at: <https://www.unep.org/resources/report/first-global-integrated-marine-assessment-world-ocean-assessment-i>. Accessed on 12 April 2022.

⁵⁸⁹ Silva, S.T.; Leuzinger, M.D. (2019). *Ob. cit.*, p. 127.

⁵⁹⁰ UNSDG (2019). Foundational primer on the 2030 Agenda for sustainable development. United Nations Sustainable Development Group, p. 10. Available at: <https://unsdg.un.org/sites/default/files/2019-11/UNSDG-SDG-Primer-Report.pdf>. Accessed on 13 May 2023.

⁵⁹¹ UNGA (2015). *Ob. cit.*, n.p.

with minimal progress since 2015⁵⁹².

When it comes to SDG 14, despite its critical role for achieving other SDGs – as it is positively correlated with the achievement of at least 10 other SDGs, including SDGs 1, 2, 3, 5, 6, 7, 11, 13, 15, and 16 –, the reality shows that this is one of the most challenging goals to realise, as it requires significant efforts to address complex issues like ocean degradation, overfishing, and marine pollution. Besides, funding and research dedicated to SDG 14 have been insufficient, limiting the potential for substantial progress⁵⁹³. As Figure 18 shows, the global progress toward achieving SDG 14 has essentially stalled:

Figure 18 – World's Overall Performance on SDGs⁵⁹⁴



Source: Sachs, J.D.; Lafortune, G.; Fuller, G. (2024). **Sustainable Development Report 2024: The SDGs and the UN Summit of the Future.**

⁵⁹² Sachs, J.D.; Lafortune, G.; Fuller, G. (2024). **Sustainable Development Report 2024: The SDGs and the UN Summit of the Future.** Published by Dublin University Press Dublin, Ireland, p. 15. DOI: 10.25546/108572. Available at: <https://s3.amazonaws.com/sustainabledevelopment.report/2024/sustainable-development-report-2024.pdf>. Accessed on 11 May 2023.

⁵⁹³ Andriamahefazafy, M.; *et al.* (2022). Sustainable development goal 14: To what degree have we achieved the 2020 targets for our oceans? **Ocean & Coastal Management**, vol. 227, p. 1. DOI: <https://doi.org/10.1016/j.ocecoaman.2022.106273>. Available at: <https://www.sciencedirect.com/science/article/pii/S0964569122002496>. Accessed on 09 May 2023.

⁵⁹⁴ Sachs, J.D.; Lafortune, G.; Fuller, G. (2024). *Ob. cit.*, p. 498.

Achieving SDG 14 requires addressing global structural imbalances. These imbalances allow some nations to offload harmful activities, such as overfishing or pollution, onto other countries through trade, fishing agreements, or geopolitical ties. To implement SDG 14 effectively, a global collaborative approach is essential, along with high-level commitments to enforce sustainable practices beyond national borders. Furthermore, it is critical to involve stakeholders most impacted by marine resource management in decision-making processes – these include policymakers at the national level as well as community-based actors at the local level⁵⁹⁵.

Finally, it should be noted that despite the existence of 17 SDGs with 169 targets and 247 indicators, SDG 14 contains only one indicator (14.1.1 (b)) specifically aimed at reducing marine plastic pollution. Other SDGs lack targets or indicators related to reducing (micro)plastics. This presents significant challenges for governments and organisations in accurately reporting and monitoring the progress of other SDGs due to the widespread impact of (micro)plastic pollution on the environment, society, and the economy – considering that at least 12 SDGs are directly or indirectly influenced by (micro)plastic pollution⁵⁹⁶, as Figure 19 shows:

⁵⁹⁵ Andriamahefazafy, M.; *et. al.* (2022). *Ob. cit.*, p. 7.

⁵⁹⁶ Walker, T.R. (2021). *Ob. cit.*, p. 2-3.

Figure 19 – Summary of UN SDGs directly impacted by (micro)plastics⁵⁹⁷

	Negative impacts on ecosystem services and economic impacts on communities
	Presence of (micro)plastics in food packaging, agricultural soils, fruits and vegetables, fish and shellfish posing potential risks to human health through ingestion
	Presence of (micro)plastics in humans and fetus via ingestion, inhalation, and dermal exposure of microplastics in packed food products, foodstuff, and air
	Presence of (micro)plastics in drinking water and treated wastewater effluent
	Incineration of (micro)plastic waste used in waste-to-energy systems contributes to greenhouse gas emissions, release of atmospheric pollution, and is unsustainable
	Innovation is required for sustainable bio-based alternatives to fossil fuel-based plastics to help contributing to a circular economy
	Exports of plastic waste from developed to developing countries have been considered waste pollution transfer
	Indiscriminate disposal of plastics in countries with inadequate waste management systems is choking critical urban infrastructure
	Unsustainable global plastic production and plastic waste mismanagement
	Greenhouse gases are emitted at every step of the plastic life cycle, from production to transportation to waste disposal
	Extraordinary efforts are required to reduce emissions of (micro)plastics to marine and freshwater ecosystems
	Mismanagement of (micro)plastic waste causing widespread terrestrial pollution of (micro)plastics in landfills, urban and rural areas, protected areas, and agricultural soils

Source: adaptation from Walker, T.R. (2021). (Micro)plastics and the UN Sustainable Development Goals. **Current Opinion in Green and Sustainable Chemistry**, vol. 30.

The 2030 Agenda for Sustainable Development highlights the interconnected nature of the planet's most pressing issues – and plastic pollution is among them –, stressing the need for integrated solutions and a holistic approach. The biggest lesson that the 2030 Agenda provides in this context, thus, is that to effectively address these challenges, fresh and renewed strategies are essential. There is potential for cautious optimism about the role of the SDGs in tackling marine plastic pollution – as they show an improvement, especially when compared to the MDGs⁵⁹⁸.

⁵⁹⁷ Walker, T.R. (2021). *Ob. cit.*, p. 4.

⁵⁹⁸ Gonçalves, L.C.S. (2020). Legal remedies against the plastic pollution of the oceans: an analysis of the attempts from public international law and private initiatives to face the plastic soup. Doctoral Thesis, Maastricht University. ProefschriftMaken. DOI: <https://doi.org/10.26481/dis.20200611lg>. Available at: <https://cris.maastrichtuniversity.nl/en/publications/legal-remedies-against-the-plastic-pollution-of-the-oceans-an-ana-2>. Accessed on 12 February 2022.

Global environmental changes and unsustainable marine practices pose significant challenges to achieving SDG 14. Achieving this goal requires tackling the underlying causes of these environmental changes. Effective management strategies for SDG 14 need a comprehensive, interdisciplinary approach that integrates both natural and social sciences⁵⁹⁹.

Moreover, in alignment with the 2030 Agenda, it is essential to ensure inclusivity in global efforts to eliminate plastic pollution, focusing especially on vulnerable groups such as waste pickers and informal recyclers⁶⁰⁰. A rights-based approach to the global governance of plastics and related chemicals can be realised by promoting Principle 10 of the Rio Declaration⁶⁰¹ and safeguarding the human right to a clean, healthy, and sustainable environment, as outlined in UNGA Resolution 76/300⁶⁰².

For that, the achievement of the SDG 14 – which is provenly fundamental for the accomplishment of other SDGs, as well as to engage the international community in the fight against marine plastic pollution –, has gone beyond the implementation of 2030 Agenda.

The UN has fostered significant progress, such as the 2017 meeting in New York, which brought together heads of States, civil society, and stakeholders. This led to the publication of the document “*Our Ocean, Our Future: Call for Action*”, which emphasised the urgency of addressing plastic pollution and reducing plastic and microplastic use – by implementing strategies to “*reduce the use of plastics and microplastics, in particular plastic bags and single-use plastics, (...)*”⁶⁰³.

⁵⁹⁹ Harris, P.G. (2022). *Ob. cit.*, p. 296.

⁶⁰⁰ BRS (2023). *Ob. cit.*, p. 18.

⁶⁰¹ Principle 10 states “Environmental issues are best handled with the participation of all concerned citizens, at the relevant level. At the national level, each individual shall have appropriate access to information concerning the environment that is held by public authorities, including information on hazardous materials and activities in their communities, and the opportunity to participate in decision-making processes. States shall facilitate and encourage public awareness and participation by making information widely available. Effective access to judicial and administrative proceedings, including redress and remedy, shall be provided.” In: UNGA (1992). Rio Declaration on Environment and Development. Report of the United Nations Conference on Environment and Development, Rio de Janeiro, 3-14 June 1992 (A/CONF.151/26 (Vol. I)). Available at: https://www.un.org/en/development/desa/population/migration/generalassembly/docs/globalcompact/A_CONF.151_26_Vol.I_Declaration.pdf. Accessed on 10 May 2023.

⁶⁰² By Resolution 76/300, the General Assembly recognised the right to a clean, healthy and sustainable environment as a human right. In: UNGA (2022). 76/300. The human right to a clean, healthy and sustainable environment. Resolution adopted by the General Assembly on 28 July 2022 (A/RES/76/300). Available at: <https://documents.un.org/doc/undoc/gen/n22/442/77/pdf/n2244277.pdf>. Accessed on 10 May 2023.

⁶⁰³ UNGA (2017a). 71/312. Our ocean, our future: call for action. Seventy-first session Agenda items 19 and 73 (a) Resolution adopted by the General Assembly on 6 July 2017 (A/RES/71/312). Available at: https://digitallibrary.un.org/record/1291421/files/A_RES_71_312-EN.pdf?ln=en. Accessed on 12 February 2022.

As the condition of the ocean continues to decline, the international community has been paying increasing attention to ocean conservation and protection. In this sense, the UN has launched the Decade of Ocean Science for Sustainable Development, from 2021 to 2030⁶⁰⁴, which is further analysed below.

⁶⁰⁴IOC-UNESCO (2020a). *Ob. cit.*, p. 5.

2.1.2.2 The Ocean Conferences and the Decade of Ocean Science for Sustainable Development

For much of human history, the belief that marine resources are limitless and the ocean's capacity to absorb waste is infinite was widely accepted. Until the mid-twentieth century, the ocean was primarily seen as a transportation route, an abundant source of food, and a convenient dumping ground⁶⁰⁵.

The current ocean governance framework consists of the rules, norms, principles, and decision-making processes created to collectively oversee the diverse users and various uses of the ocean⁶⁰⁶. In this context, marine plastic debris is a form of marine pollution that has garnered increasing attention from international organisations in recent years. However, there is currently no global framework specifically focused on this issue – as already identified above.

At the international level, MPP is addressed more broadly, alongside other types of marine pollution. The core of the relevant legal framework consists of general obligations aimed at protecting and preserving the marine environment, as well as State duties related to pollution prevention and control. These obligations are partly derived from general international law, reflected in Part XII of the UNCLOS⁶⁰⁷, and are also enshrined in regional legal instruments.

The protection and preservation of the marine environment is one of the central goals of the international law of the sea, with environmental issues playing an increasingly prominent role on the global political agenda for ocean governance. Regulations focused on pollution control, and more recently, on pollution prevention, lie at the core of the framework for safeguarding the marine environment⁶⁰⁸.

Although the harmful effects of marine plastic pollution have been known since the early 1970s⁶⁰⁹, it was only in more recent years that the full extent of the problem was recognised, and action began to be taken. The UNEP, in this context, has been playing a

⁶⁰⁵ Schäli, J. (2022). *Ob. cit.*, p. 108.

⁶⁰⁶ Mendenhall, E. (2019). The Ocean Governance Regime International Conventions and Institutions. In: **Climate Change and Ocean Governance – Politics and Policy for Threatened Seas**. Harris, P.G. (ed.). Cambridge University Press: United Kingdom, 2019, p. 27. ISBN 978-1-108-42248-2.

⁶⁰⁷ UNCLOS, Part XII “Protection and preservation of the marine environment”.

⁶⁰⁸ Schäli, J. (2022). *Ob. cit.*, p. 109.

⁶⁰⁹ In 1972, as an example, a study found that plastic particles were widespread in the western Sargasso Sea, with concentrations averaging 3.500 pieces and 290 grams per square kilometre. In: Carpenter, E.J.; Smith, K.L.Jr.(1972). Plastics on the Sargasso Sea Surface. **Science**, vol. 175, n. 4027, pp. 1240-1241. DOI: 10.1126/science.175.4027.1240. Available at: <https://www.science.org/doi/abs/10.1126/science.175.4027.1240>. Accessed on 17 January 2023.

key role in shaping global policy on marine pollution from land-based sources and plastics⁶¹⁰.

The UNEP has also published several guidelines to address marine pollution in general, including the *Guidelines on Survey and Monitoring of Marine Litter*⁶¹¹, *Guidelines on the Use of Market-Based and Economic Instruments*⁶¹², and *Marine Litter: A Global Challenge*⁶¹³. The latter report offers several recommendations for the 13 participating Regional Seas Programs⁶¹⁴, such as the development of a Regional Action Plan or strategy to tackle marine pollution; global mitigation efforts coordinated regionally and implemented nationally; National Plans of Action based on existing legislation; and enhanced coordination among UN organisations working on the marine litter issue⁶¹⁵.

Key milestones in the development of a policy framework for addressing land-based pollution include, as well, the 1972 Stockholm Conference and the subsequent establishment of UNEP, the adoption of Agenda 21 at the 1992 Rio Conference, and the creation of the GPA in 1995. A decade later, the UN officially placed marine debris and plastics on its permanent agenda and began an overdue debate on the issue. Meanwhile, the topic was also taken up by other forums, including multi-stakeholder dialogues⁶¹⁶.

⁶¹⁰ For instance, in Resolution 4/6 of 2019 (UNEP/EA.4/Res.6) on marine plastic litter and microplastics, the member states of the UNEA emphasised the need for a unified methodology to measure plastic flows and leakage across the value chain. This resolution provided the foundation for UNEP and IUCN to develop a methodology aimed at helping countries fill existing knowledge gaps, better understand the scale of the issue at the national level and ultimately address the root causes of the problem. Many other UNEP initiatives play a crucial role in advancing ocean governance by promoting cooperation, science-policy dialogues, and inclusive partnerships. In: UNEP (2020b). National guidance for plastic pollution hotspotting and shaping action - Introduction report. Boucher, J.; Zgola, M.; *et al.* United Nations Environment Programme. Nairobi, Kenya. Available at: <https://wedocs.unep.org/bitstream/handle/20.500.11822/33166/NGP.pdf?sequence=1&isAllowed=y>. Accessed on 18 February 2023.

⁶¹¹ Cheshire, A.C. ; *et al.* (2009). *Ob. cit.*, p. 2.

⁶¹² Ten Brink, P.; *et al.* (2009). *Guidelines on the Use of Market-based Instruments to Address the Problem of Marine Litter*. Institute for European Environmental Policy (IEEP), Brussels, Belgium, and Sheavly Consultants, Virginia Beach, Virginia, USA. 60 pp. Printed in Nairobi by the United Nations Environment Programme. Available at: https://ieep.eu/wp-content/uploads/2009/04/Economic_Instruments_and_Marine_Litter.pdf. Accessed on 13 January 2024.

⁶¹³ UNEP (2009). *Marine Litter: A Global Challenge*. Nairobi: UNEP. 232 pp. ISBN 978-92-807-3029-6. Available at: <https://www.unep.org/resources/report/marine-litter-global-challenge>. Accessed on 13 January 2024.

⁶¹⁴ More than 143 countries participate in 13 Regional Seas programmes established under the auspices of UNEP: Black Sea, Wider Caribbean, East Asian Seas, Eastern Africa, South Asian Seas, ROPME Sea Area, Mediterranean, North-East Pacific, Northwest Pacific, Red Sea and Gulf of Aden, South-East Pacific, Pacific, and Western Africa. Six of these programmes, are directly administered by UNEP. In: UN (2024c). *Regional Seas Programme*. Division of Environmental Policy Implementation. Available at: <https://sdgs.un.org/partnerships/regional-seas-programme>. Accessed on 18 February 2024.

⁶¹⁵ Stoett, P.; Vince, J. (2019). *The Plastic-Climate Nexus – Linking Science, Policy, and Justice*. In: **Climate Change and Ocean Governance – Politics and Policy for Threatened Seas**. Harris, P.G. (ed.). Cambridge University Press: United Kingdom, 2019, p. 354. ISBN 978-1-108-42248-2.

⁶¹⁶ Schäli, J. (2022). *Ob. cit.*, p. 110.

Although the 1990 GESAMP Report on the state of the marine environment⁶¹⁷, Agenda 21, and the GPA all acknowledged the challenges posed by plastic litter and marine debris⁶¹⁸, it took another decade for the issue to be placed on the UN's permanent agenda. And the Open-ended Informal Consultative Process on Oceans and the Law of the Sea (ICP) played a significant role in this development⁶¹⁹.

Following a recommendation from the UNGA, the issue of marine debris was discussed at the ICP's sixth meeting (ICP-6) in 2005⁶²⁰ and again at its seventeenth meeting (ICP-17), held in June 2016⁶²¹. The topic was a fitting one, as the ICP serves as a forum to promote the exchange of information and ideas on complex ocean issues that lack a single institutional "home"⁶²². During the 2016 discussions, it was noted that the scale of the problem had grown exponentially

since the topic of marine debris was addressed at the sixth meeting of the Informal Consultative Process, in 2005. It was noted that marine debris in general, and plastics in particular, were some of the greatest environmental

⁶¹⁷ GESAMP (1990). The State of the Marine Environment. Reports and Studies, N. 39. IMO/FAO/Unesco/WMO/WHO/IAEA/UN/UNEP Joint Group of Experts on the Scientific Aspects of Marine Pollution (GESAMP). Available at: <http://www.gesamp.org/site/assets/files/1216/the-state-of-the-marine-environment-en.pdf>. Accessed on 19 February 2024.

⁶¹⁸ In fact, it was through the Agenda 21 that the UNEP was called to convene a meeting on land-based sources and identified key actions for addressing those, with a specific Chapter (17) dedicated to the protection of the ocean and all kinds of seas. The called meeting was convened in November 1995, resulting in the creation of the GPA for the Protection of the Marine Environment from Land-Based Activities, with UNEP serving as the Secretariat. For more, see Chapter 1, Section B of this thesis.

⁶¹⁹ The ICP was established by UNGA Resolution 54/33 (1999) paragraph 2, in alignment with the legal framework set by UNCLOS and the objectives of Chapter 17 of Agenda 21. The ICP's main task is to support the UNGA's annual review of developments in ocean affairs by proposing specific issues for consideration, with a focus on identifying areas where intergovernmental and inter-agency coordination and cooperation should be strengthened. In: UNGA (1999). 54/33. Results of the review by the Commission on Sustainable Development of the sectoral theme of "Oceans and seas": international coordination and cooperation. Fifty-fourth session Agenda item 40 (c), Resolution adopted by the General Assembly A/RES/54/33. Available at: <http://www.worldlii.org/int/other/UNGA/1999/71.pdf>. Accessed on 12 March 2024.

⁶²⁰ UNGA (2005). Report on the work of the United Nations Open-ended Informal Consultative Process on Oceans and the Law of the Sea at its sixth meeting. Sixtieth session Item 76 (a) of the preliminary list* Oceans and the law of the sea. Available at: <https://documents.un.org/doc/undoc/gen/n05/414/01/pdf/n0541401.pdf>. Accessed on 15 March 2024.

⁶²¹ UNGA (2016). Report on the work of the United Nations Open-ended Informal Consultative Process on Oceans and the Law of the Sea at its seventeenth meeting. Seventy-first session Item 74 (a) of the provisional agenda* Oceans and the law of the sea: oceans and the law of the sea. Available at: <https://documents.un.org/doc/undoc/gen/n16/234/77/pdf/n1623477.pdf>. Accessed on 15 March 2024.

⁶²² IISD (2016). Summary of the seventeenth meeting of the United Nations Open-Ended Informal Consultative Process on Oceans and the Law of the Sea: 13-17 June 2016. Earth Negotiations Bulletin, vol. 25, n. 107. Published by the International Institute for Sustainable Development (IISD) – A Reporting Service for Environment and Development Negotiations, p. 12. Available at: https://s3.us-west-2.amazonaws.com/enb.iisd.org/archive/download/pdf/enb25107e.pdf?X-Amz-Content-Sha256=UNSIGNED-PAYLOAD&X-Amz-Algorithm=AWS4-HMAC-SHA256&X-Amz-Credential=AKIA6QW3YWTJ6YORWEEL%2F20250123%2Fus-west-2%2Fs3%2Faws4_request&X-Amz-Date=20250123T174425Z&X-Amz-SignedHeaders=host&X-Amz-Expires=60&X-Amz-Signature=b5cf4755a7381f42b7a5518544f212baa69674d63c1c60e18f2e07ddd3b48800. Accessed on 12 March 2024.

concerns of our times, along with climate change, ocean acidification and loss of biodiversity⁶²³.

Several delegates underscored the need to tackle the issue both downstream – through better waste management, disposal, and recycling mechanisms – and upstream – by addressing consumption and production patterns, including through awareness-raising campaigns⁶²⁴. Since ICP-6 in 2005, marine debris has been a consistent topic in the UNGA’s annual resolution on oceans and the law of the sea. Marine plastic debris, in particular, have gained increased attention in recent years.

In June 2017, a high-level UN Conference was held at the UN Headquarters in New York to support the implementation of SDG 14 – it was the first UN Ocean Conference (UNOC). The UNOC aimed to identify strategies and actions to advance SDG 14, increase stakeholder participation, and contribute to the HLPF (a body created to accelerate efforts toward achieving the SDGs)⁶²⁵.

The UNOC resulted in three key outcomes: an intergovernmentally agreed Call for Action – “Our Ocean, Our Future”⁶²⁶ –, a registry of voluntary commitments (with 1328 initial registrations and more than 150 pledges to reduce plastic waste), and key messages from the “Partnership Dialogues”⁶²⁷. These outcomes further emphasised the importance of the climate-ocean connection in governance responses to the challenges arising from the complex interactions between these two major natural systems⁶²⁸.

Plastics and microplastics were also central topics of discussion. In the Call for Action, States urged all stakeholders to

⁶²³ UNGA (2016). *Ob. cit.*, p. 3-4.

⁶²⁴ IISD (2016). *Ob. cit.*, p. 3.

⁶²⁵ The Conference was co-hosted by the Governments of Fiji and Sweden. In: UN (2017b). United Nations Conference to Support the Implementation of Sustainable Development Goal 14. 5-9 June 2017, New York. Available at: <https://sustainabledevelopment.un.org/index.php?menu=3280>. Accessed on 13 June 2023.

⁶²⁶ UN (2017c). Our Ocean, Our Future: Call for Action. Available at: <https://sustainabledevelopment.un.org/frameworks/ouroceanourfuture>. Accessed on 12 January 2023.

⁶²⁷ The registration of 1328 voluntary commitments from governments and other stakeholders was hailed as a significant achievement. These commitments span a broad range of areas, from establishing marine protected areas and tackling plastic and other marine debris, to funding scientific research and capacity-building initiatives. Besides, many of the 150+ voluntary commitments submitted to reduce plastic waste presented solutions that are “ready to be scaled up and replicated by other countries”. Additionally, the partnership dialogues played a key role in fostering the exchange of knowledge and experiences among conference participants, while also clarifying the connections between SDG 14 and other global goals. In: IISD (2017). Summary of the Ocean Conference: 5-9 June 2017. Earth Negotiations Bulletin A Reporting Service for Environment and Development Negotiations, vol. 32, n. 33. Available at: <https://enb.iisd.org/download/pdf/enb3233e.pdf>. Accessed on 17 January 2023.

⁶²⁸ Makomere, R.; Mbeva, K.L. (2019). Contested Multilateralism – Toward Aligning Regimes for Ocean and Climate Governance. In: **Climate Change and Ocean Governance** – Politics and Policy for Threatened Seas. Harris, P.G. (ed.). Cambridge University Press: United Kingdom, 2019, p. 263. ISBN 978-1-108-42248-2.

(g) Accelerate actions to prevent and significantly reduce marine pollution of all kinds, particularly from land-based activities, including marine debris, plastics and microplastics, (...);

(h) Promote waste prevention and minimization; develop sustainable consumption and production patterns; adopt the 3Rs – reduce, reuse and recycle – including through incentivizing market-based solutions to reduce waste and its generation, improving mechanisms for environmentally sound waste management, disposal and recycling and developing alternatives such as reusable or recyclable products or products that are biodegradable under natural conditions;

(i) Implement long-term and robust strategies to reduce the use of plastics and microplastics, in particular plastic bags and single-use plastics, (...)⁶²⁹.

Besides, most of the voluntary commitments adopted, related to target 14.1 on marine pollution, focused on tackling issues like plastics and litter in the marine environment⁶³⁰. Other proposed measures included nutrient management through wastewater treatment, better management of agricultural inputs like fertilisers and manure, and addressing pollution from shipping⁶³¹.

Such voluntary commitments represent a form of environmental governance that is separate from binding treaty agreements and the creation of soft law. There is no universal definition of a voluntary commitment, as they can take various forms, ranging from one-time actions or events to legislative changes, regulatory standards, and philanthropic pledges. However, this governance approach has become increasingly common, particularly alongside the growing trend of multi-stakeholder partnerships between state and non-state actors, a trend that has gained prominence since the 2002 World Summit on Sustainable Development⁶³².

This type of governance seeks to promote a more flexible and rapid approach to engagement by actors, fostering innovation, encouraging experimentation, and spreading best practices. The visibility of voluntary commitments platforms also aims to inspire

⁶²⁹ UNGA (2017a). *Ob. cit.*, n.p.

⁶³⁰ Annex II of the Report of IUNOC provides the complete list of voluntary commitments. In: UN (2017a). Report of the United Nations Conference to Support the Implementation of Sustainable Development Goal 14: Conserve and sustainably use the oceans, seas and marine resources for sustainable development (A/CONF.230/14). Available at: <https://digitallibrary.un.org/record/1301296?v=pdf>. Accessed on 13 January 2023.

⁶³¹ Vierros, M.; Buonomo, R. (2017). In-depth analysis of Ocean Conference Voluntary Commitments to support and monitor their implementation. Prepared By Division for Sustainable Development Department of Economic and Social Affairs United Nations, p. 2. Available at: https://sustainabledevelopment.un.org/content/documents/17193OCVC_in_depth_analysis.pdf. Accessed on 15 January 2024.

⁶³² Chan, N. (2024). Voluntary commitments for ocean sustainability: Comparing the UN Ocean Conference and Our Ocean Conference platforms. **Marine Policy**, vol. 160, p. 1. DOI: <https://doi.org/10.1016/j.marpol.2023.105956>. Available at: <https://www.sciencedirect.com/science/article/pii/S0308597X2300489X>. Accessed on 18 November 2024.

others to participate, offering reputational advantages by substantiating claims of leadership⁶³³.

The first UN Ocean Conference, thus, had a pivotal role to attracting commitments. The I UNOC provided many of the most significant developments in the evolution of ocean governance. It was also fundamental to deliberate efforts to align the climate change regime with ocean governance, recognising the importance of the intricate connections between climate and ocean systems⁶³⁴.

After that, in its resolution 73/292, the UNGA decided to hold the high-level 2020 UN Conference to Support the Implementation of SDG 14 in Lisbon, from June 2 to 6, 2020. The conference was set to focus on the overarching theme “*Scaling up ocean action based on science and innovation for the implementation of Goal 14: stocktaking, partnerships, and solutions*”⁶³⁵.

The second UNOC, nevertheless, had to be postponed due to the outbreak of the Covid-19 pandemic. Therefore, it was only in 2022 that the II UNOC was held in Lisbon, aiming to

- (a) Build on existing successful partnerships and stimulate innovative and concrete new partnerships to advance the implementation of Goal 14;
- (b) Support further action to conserve and sustainably use the oceans, seas and marine resources for sustainable development, giving due consideration to the call made in the declaration entitled “Our ocean, our future: call for action”;
- (c) Identify further ways and means to support the implementation of Goal 14;
- (d) Involve all relevant stakeholders, bringing together Governments, the United Nations system, intergovernmental organizations, international financial institutions, other interested international bodies, non-governmental organizations, civil society organizations, academic institutions, the scientific community, the private sector, philanthropic organizations and other actors to assess challenges and opportunities relating to, as well as actions taken towards, the implementation of Goal 14;
- (e) Share the experiences gained at the national, regional and international levels in the implementation of Goal 14;

⁶³³ Urho, N. (2021). Commitment Platforms and the Global Agenda for Chemicals and Waste Management. Center for Governance and Sustainability, University of Massachusetts Boston, p. 31. Available at: https://xn--789c2bcb-2f104a1b-9807566a4b86a576-n74uja.filesusr.com/ugd/27be4e_5662a7e51e8f4247903b52f425ed7714.pdf. Accessed on 13 October 2024.

⁶³⁴ Makomere, R.; Mbeva, K.L. (2019). *Ob. cit.*, p. 262-283.

⁶³⁵ UNGA (2019b). Preparatory process of the 2020 United Nations Conference to Support the Implementation of Sustainable Development Goal 14: Conserve and sustainably use the oceans, seas and marine resources for sustainable development (A/74/630). Available at: <https://documents.un.org/doc/undoc/gen/n19/435/89/pdf/n1943589.pdf>. Accessed on 17 May 2023.

(f) Identify possible challenges and obstacles relating to the achievement of all the targets under Goal 14, as well as opportunities and innovative ways and means to support their implementation; (...) ⁶³⁶.

Following a week filled with high-level presentations, panels, and discussions, delegates unanimously adopted the Lisbon Declaration, embracing the motto “*Our ocean, our future, our responsibility*”⁶³⁷. Among the most discussed topics, it is of relevance to highlight: the need for increased funding for ocean sustainability (with UN Secretary-General António Guterres emphasising that SDG 14 is the least funded of all the SDGs⁶³⁸); and commitments to begin negotiations for a legally binding treaty to tackle plastic pollution⁶³⁹.

The final declaration adopted at the II UNOC, in fact, stressed that science-driven and innovative actions, along with international cooperation and partnerships grounded in science, technology, and innovation, aligned with the precautionary approach and ecosystem-based approaches, can help provide solutions to the challenges of achieving SDG 14 by

Preventing, reducing and eliminating marine plastic litter, including single-use plastics and microplastics, including through contributing to comprehensive life-cycle approaches, encouraging resource efficiency and recycling, as well as environmentally sound waste management, ensuring sustainable consumption and production patterns, developing viable alternatives for consumer and industrial uses, taking into account the full environmental impacts, innovation in product design and environmentally sound remediation of marine plastic litter that is already in marine environments, and recognizing the establishment by the United Nations Environment Assembly at its resumed fifth session of an intergovernmental negotiating committee towards an international legally binding instrument on plastic pollution; (...) ⁶⁴⁰.

⁶³⁶ UNGA (2019c). 73/292. 2020 United Nations Conference to Support the Implementation of Sustainable Development Goal 14: Conserve and sustainably use the oceans, seas and marine resources for sustainable development (A/RES/73/292). Available at: <https://documents.un.org/doc/undoc/gen/n19/136/24/pdf/n1913624.pdf>. Accessed on 12 May 2023.

⁶³⁷ The declaration “Our ocean, our future, our responsibility” was adopted as the outcome document of the II UNOC. In: UN (2022b). Report of the 2022 United Nations Conference to Support the Implementation of Sustainable Development Goal 14: Conserve and sustainably use the oceans, seas and marine resources for sustainable development (A/CONF.230/2022/14). Available at: <https://documents.un.org/doc/undoc/gen/n22/454/51/pdf/n2245451.pdf>. Accessed on 17 November 2023.

⁶³⁸ UN (2022c). Guterres outlines four recommendations to help us all ‘Save Our Ocean’. UN News. Available at: <https://www.un.org/tr/desa/guterres-outlines-four-recommendations-help-us-all-save-our-ocean#:~:text=sustainable%20ocean%20economies-,Mr.,of%20any%20of%20the%20SDGs>. Accessed on 16 June 2023.

⁶³⁹ UN (2022d). With Marine Pollution at ‘Alarming’ Levels, Speakers at Ocean Conference Dialogue Demand Urgent Action to Clean World’s Seas, Call for Political Will. Meetings Coverage and Press Releases: UN Ocean Conference, Interactive Dialogue 1 (PM) – SEA/2144, 27 June 2022. Available at: <https://press.un.org/en/2022/sea2144.doc.htm>. Accessed on 18 November 2022.

⁶⁴⁰ UN (2022b). *Ob. cit.*, p. 8.

Building on the legacy of the II UNOC, the third edition of the Conference took place in Nice, France, from 9 to 13 June 2025⁶⁴¹. The III UNOC aimed to accelerate concrete action and mobilise a wide range of actors for the conservation and sustainable use of the ocean, while also supporting the implementation of SDG 14. To this end, three overarching priorities were identified as the basis for an ambitious “*Nice Ocean Action Plan*”: priority 1 – work towards the successful completion of ocean-related multilateral processes to raise the level of ambition for ocean protection; priority 2 – mobilising funding for SDG 14 and supporting the development of a sustainable blue economy.; and priority 3 – strengthen and better disseminate marine science knowledge for better policy-making⁶⁴².

At the close of a week of discussions and negotiations, the conference culminated in the consensus adoption of a political declaration entitled “*Our ocean, our future: united for urgent action*” – the so-called “*Nice Ocean Action Plan*.” The declaration reaffirmed the central role of the ocean in mitigating the impacts of climate change and called for urgent, coordinated international efforts to safeguard marine ecosystems⁶⁴³.

In the declaration, the Heads of State and Government and high-level representatives explicitly voiced their concern over the growing levels of plastic pollution in the ocean

and its negative impacts on the environment and ecosystems and the environmental, social and economic dimensions of sustainable development. We recognize the importance of addressing this global challenge, and thus reaffirm our commitment to **develop an international legally binding instrument on plastic pollution, including in the marine environment, which could include both binding and voluntary approaches, based on a comprehensive approach that addresses the full life cycle of plastic**, taking into account, (...) national circumstances and capabilities, in line with the mandate set out in United Nations Environment Assembly resolution 5/14 of 2 March 2022⁶⁴⁴. (*author’s emphasis*)

As one of the key outcomes of the III UNOC, this declaration represents the voluntary commitments undertaken by a wide range of stakeholders, whether individually or in partnership, across multiple formats: the plenary sessions, the ten Ocean Action

⁶⁴¹ France and Costa Rica co-organised the III UNOC in Nice.

⁶⁴² UNOC (2025a). Third United Nations Ocean Conference Nice 2025. Available at: <https://unocnice2025.org/en/>. Accessed on 30 January 2025.

⁶⁴³ UN (2025a). Nice Conference Adopts Declaration Underscoring Vital Importance of Ocean to Life on Our Planet, Essential Role in Mitigating Climate Change. UN Ocean Conference, 8th Meeting (PM). 13 June 2025. Meetings Coverage and Press Releases. Available at: <https://press.un.org/en/2025/sea2231.doc.htm>. Accessed on 09 August 2025.

⁶⁴⁴ UN (2025b). Our ocean, our future: united for urgent action. Draft resolution submitted by the Presidents of the Conference (Costa Rica and France) (A/CONF.230/2025/L.1), p. 4. Available at: <https://docs.un.org/en/A/CONF.230/2025/L.1>. Accessed on 07 August 2025.

Panels, the three Special Events devoted to science, the blue economy and finance, as well as during the celebration of the World Ocean Day on 8 June. Closely linked to this declaration is another pivotal document, the “*Nice Commitments for the Ocean*”, which translates the Conference’s political declaration into tangible actions. These commitments highlight the progress made in environmental multilateralism since the II UNOC and reaffirm the collective determination of the 193 UN Member States and non-State actors to raise the level of ambition in safeguarding the ocean⁶⁴⁵.

Among the various commitments, one of the most notable was the effort to build international momentum in favour of the Global Plastics Treaty: in this context, 96 countries endorsed in Nice the declaration entitled “*Nice Wake-Up Call for an Ambitious Plastics Treaty*”⁶⁴⁶.

Through the broad mobilisation of diverse stakeholders, the III UNOC has outlined a roadmap and a concrete agenda for advancing ocean action. With only five years remaining to achieve the targets of SDG 14, forthcoming milestones – such as the first Ocean COP⁶⁴⁷ – will be pivotal in sustaining momentum. The Nice Conference has thus inaugurated a transformative chapter in global ocean governance, responding to the urgent need for decisive action at the planetary level⁶⁴⁸.

Both the II UNOC and the III UNOC happened already in the context of the Decade of Ocean Science for Sustainable Development – or simply the Ocean Decade. As the global community faces the growing challenges of the Anthropocene, the integration of science and diplomacy becomes (increasingly) crucial⁶⁴⁹.

Anthropogenic marine debris, especially plastic, is an increasing threat to marine ecosystems, maritime activities, and the health of ocean users. As such, the UN has been

⁶⁴⁵ UNOC (2025b). The Nice Commitments for the Ocean. 3rd United Nations Ocean Conference, Nice, 2-13 June 2025. Available at: <https://www.elysee.fr/admin/upload/default/0001/18/8bf8571c69e44c361a2ec0727c152abc09ae998b.pdf>. Accessed on 12 August 2025.

⁶⁴⁶ UNOC (2025c). The Nice wake up call for an ambitious plastics treaty. Available at: <https://www.ecologie.gouv.fr/sites/default/files/documents/The%20Nice%20wake%20up%20call%20for%20an%20ambitious%20plastics%20treaty.pdf>. Accessed on 12 August 2025.

⁶⁴⁷ The second session of the Preparatory Commission for the Entry into Force of the Agreement under UNCLOS on the Conservation and Sustainable Use of Marine Biological Diversity in Areas Beyond National Jurisdiction (BBNJ) is taking place from 18 to 29 August 2025. Informally referred to as the “UN Ocean Treaty”, the BBNJ Agreement might have its first Conference of the Parties in 2026, already commonly labelled as COP 1 for the Ocean or the “Ocean COP”. The Agreement has been open for signature by all States and regional economic integration organisations from 20 September 2023 to 20 September 2025 and will enter into force 120 days after the deposit of the sixtieth instrument of ratification, approval, acceptance, or accession. In: UN (2023a). *Ob. cit.*, n.p.

⁶⁴⁸ UNOC (2025b). *Ob. cit.*, p. 13.

⁶⁴⁹ Polejack, A. (2021). The Importance of Ocean Science Diplomacy for Ocean Affairs, Global Sustainability, and the UN Decade of Ocean Science. **Frontiers in Marine Science**, vol. 8, p. 2. DOI: 10.3389/fmars.2021.664066. Available at: <https://www.frontiersin.org/journals/marine-science/articles/10.3389/fmars.2021.664066/full>. Accessed on 19 November 2022.

working to highlight the importance and centrality of the ocean to achieving sustainable development. One of the most important initiatives in this context is the Ocean Decade (from 2021 to 2030)⁶⁵⁰.

The Ocean Decade was proclaimed in 2017 at the 72nd session of the UNGA, through Resolution 72/73 “Oceans and the law of the sea”. This was the result of an initiative of the IOC of the UNESCO, which endorsed the “*proposal for an international decade of ocean science for sustainable development, to be established for the period 2021–2030*”. The UN, therefore, decided

to proclaim the United Nations Decade of Ocean Science for Sustainable Development for the 10-year period beginning on 1 January 2021, within existing structures and available resources, and calls upon the Intergovernmental Oceanographic Commission to prepare an implementation plan for the Decade in consultation with Member States, specialized agencies, funds, programmes and bodies of the United Nations, as well as other intergovernmental organizations, non - governmental organizations and relevant stakeholders; (...)⁶⁵¹.

From 1 January 2021, thus, the Ocean Decade has been supporting efforts to reverse the cycle of decline in ocean health and bring together stakeholders through a common framework that ensures that ocean science⁶⁵² can support countries in creating better conditions for sustainable ocean development and achieving the 2030 Agenda in its entirety – the Ocean Decade utilises the 2030 Agenda as a key framework to identify and tackle the issues that are most pressing to society⁶⁵³.

Its objectives include providing science, ocean information and data needed to inform public policies aimed at a well-functioning ocean, in support of all the SDGs, as well as generating scientific knowledge and supporting infrastructure and partnerships. The Ocean Decade, furthermore, provides a common framework to ensure that ocean science can fully support countries in delivering on the 2030 Agenda⁶⁵⁴.

Based on the efforts undertaken during the Ocean Decade, which mobilise

⁶⁵⁰ IOC-UNESCO (2020a). *Ob. cit.*, p. 8.

⁶⁵¹ UNGA (2018a). 72/73. Oceans and the law of the sea. Resolution adopted by the General Assembly on 5 December 2017 (A/RES/72/73). Available at: https://www.un.org/en/development/desa/population/migration/generalassembly/docs/globalcompact/A_RES_72_73.pdf. Accessed on 28 September 2023.

⁶⁵² Ocean science plays a crucial role in tackling the impacts of climate change, marine pollution, ocean acidification, the decline of marine species, and the degradation of marine and coastal ecosystems. To achieve sustainable development, it is essential to rely on solid scientific research to guide policies, enhance the understanding of all stakeholders, and ultimately provide solutions to improve ocean health. In: IOC-UNESCO (2020). *Ob. cit.*, p. 7.

⁶⁵³ IOC; WESTPAC (2021). About the Ocean Decade. Available at: <https://ocean-decade.com/about/>. Accessed on 13 March 2022.

⁶⁵⁴ IOC-UNESCO (2021). The United Nations Decade of Ocean Science for Sustainable Development (2021-2030) Implementation Plan. UNESCO, Paris (IOC Ocean Decade Series, 20.), p. 4. Available at: <https://unesdoc.unesco.org/ark:/48223/pf0000377082>. Accessed on 17 March 2022.

technological innovation and resources in ocean science needed to promote key societal outcomes, it is expected to achieve, by 2030, a clean ocean; a healthy and resilient ocean; a predictable ocean⁶⁵⁵; a safe ocean; a productive and sustainably exploited ocean; and a transparent ocean⁶⁵⁶. Thus, the Ocean Decade aims, above all, to expand international cooperation in research to promote ocean protection and the management of marine living and non-living resources – consequently strengthening the implementation of the SDGs.

The goals of the Decade include facilitating the generation of data, information and knowledge needed to move towards a healthier, more resilient and safer ocean. One of the goals of this mission is to achieve clean seas where sources of pollution can be identified and reduced or removed⁶⁵⁷. Moreover, the Decade highlights the prominent place given to marine conservation at all levels, providing a new narrative for the ocean, as it is “*so central to our future*” and “*too important to neglect*”⁶⁵⁸.

Through the actions undertaken within the scope of the Ocean Decade, the UN hopes to achieve a major shift in ocean knowledge and management, adopting a global systematic approach, so that seven interrelated outcomes can be achieved: a) a clean ocean, identifying sources of pollution and carrying out their removal; b) a healthy and resilient ocean, identifying marine ecosystems and protecting them⁶⁵⁹; c) a sustainable ocean, in which economic viability, social justice and ecological prudence are observed at the same time; d) a predictable ocean, understanding ocean conditions both in the present and in the future; e) a safe ocean, enabling people to face ocean risks and be protected from them; f) a transparent and accessible ocean, with information for everyone; and g) an inspiring and engaging ocean, with the development of an ocean culture⁶⁶⁰.

⁶⁵⁵ That is, an ocean whose changes are predictable – one that can be understood and forecast in terms of both present and future conditions.

⁶⁵⁶ IOC-UNESCO (2020a). *Ob. cit.*, p. 10.

⁶⁵⁷ IOC-UNESCO (2021). *Ob. cit.*, p. 8.

⁶⁵⁸ Lubchenco, J.; Gaines, S.D. (2019). A new narrative for the ocean. **Science**, vol. 364, n. 6444, p. 911. DOI: 10.1126/science.aay2241. Available at: <https://www.science.org/doi/10.1126/science.aay2241>. Accessed on 23 December 2021.

⁶⁵⁹ Strengthening ocean resilience involves enhancing ocean health to ensure that marine ecosystems can withstand and recover from shocks and stressors, including the effects of climate change. Given the interconnectedness of the ocean, the global economy, and society, ocean resilience goes beyond just the health of the ocean, playing a key role in boosting overall economic and societal resilience. In: Friends of Ocean Action (2022). Impact pillar: building a resilient ocean – Strengthening the resilience of ocean ecosystems, economies and people. A community curated by the World Economic Forum’s Ocean Action Agenda, p. 1. Available at: https://www3.weforum.org/docs/FOA_Resilient_Ocean_2021.pdf. Accessed on 17 November 2024.

⁶⁶⁰ Hatje, V.; *et. al.* (2021). Pollutants in the South Atlantic Ocean: Sources, Knowledge Gaps and Perspectives for the Decade of Ocean Science. **Frontiers in Marine Science**, vol. 8, p. 11. DOI: 10.3389/fmars.2021.644569. Available at: <https://www.frontiersin.org/journals/marine-science/articles/10.3389/fmars.2021.644569/full>. Accessed on 14 October 2022.

In other words, SDG 14 can serve as a compass to achieve these results, notably with regard to increasing scientific knowledge, research and technology, identifying how structural issues⁶⁶¹ should be analysed to achieve such results.

Under the Ocean Decade agenda, plastics are included in the first challenge: *“understanding and mapping land-based and marine sources of pollutants and contaminants and their potential impacts on human health and ocean ecosystems, and developing solutions to mitigate or remove them”*, with the social outcome being *“a clean ocean where sources of pollution are identified, reduced or removed”*⁶⁶².

Recently, UNESCO’s IOC released ten White Papers focused on key challenges of the Ocean Decade. These papers are the result of a collaborative effort to advance the science needed to ensure that by 2030, the ocean remains healthy, resilient, safe, clean, productive, accessible, predictable, and inspiring. They have been reviewed by the global ocean community and were presented at the 2024 Ocean Decade Conference in Barcelona (Spain), three years after the start of the Ocean Decade – where joint priorities for the future of the Decade were set⁶⁶³.

Specifically in the white paper dedicated to plastic pollution “Challenge 1: Understand and beat marine pollution” it is recognised that addressing marine pollution – through reduction, prevention, and mitigation – demands a comprehensive approach to ocean management that takes into account the complex interconnections between biotic and abiotic systems across the land-ocean continuum⁶⁶⁴. Such approach aligns with the interdependence of many, if not all, of the Ocean Decade Challenges⁶⁶⁵.

The white paper also identifies how the ocean is under constant and increasing threats and degradation, especially from pollutants such as

⁶⁶¹ As it is not possible to dissociate this agenda from economic issues, but also from structural societal problems such as gender, race and ethnicity issues. From a sustainability perspective, for instance, the effects of marine pollution impact society in various ways, including threats to human health (e.g., toxins, reduced seafood availability), diminished fisheries productivity, fewer recreational opportunities, lost tourism revenue, and the loss of ecological and economic benefits due to decreased biodiversity.

⁶⁶² IOC-UNESCO (2020b). **Global Ocean Science Report 2020** – Charting Capacity for Ocean Sustainability. K. Isensee (ed.), Paris, UNESCO Publishing, p. 182. Available at: <https://unesdoc.unesco.org/ark:/48223/pf0000375147>. Accessed on 22 June 2022.

⁶⁶³ IOC-UNESCO (2024). 2024 Ocean Decade Conference. Available at: <https://oceandecade.org/events/2024-ocean-decade-conference/>. Accessed on 17 November 2024.

⁶⁶⁴ Hatje, V.; *et al.* (2024). **Ocean Decade Vision 2030 White Papers** – Challenge 1: Understand and Beat Marine Pollution. Paris, UNESCO-IOC. (The Ocean Decade Series, 51.1), p. 22. DOI: <https://doi.org/10.25607/6m86-s908>. Available at: <https://unesdoc.unesco.org/ark:/48223/pf0000390116?posInSet=1&queryId=c41322a2-bc31-4ab5-bad5-b512d2806239>. Accessed on 13 September 2024.

⁶⁶⁵ This highlights a central argument presented in this thesis: to tackle the full scope of issues caused by (marine) plastic pollution, it is essential to adopt a comprehensive and integrated approach, taking into account the synergies among various environmental agendas – as this problem impacts multiple ecosystems and ecosystem services.

chemicals, such as metals, persistent organic pollutants (POPs) listed in the Stockholm Convention on Persistent Organic Pollutants, as well as other POPs identified as priority substances (e.g., polycyclic aromatic hydrocarbons (PAHs) and perfluorinated alkyl substances (PFAS)), fertilizers, pharmaceuticals (e.g., hormones, personal care products, antibiotics), and plasticizers;
 oil and other petroleum-based products, such as plastics which are currently the subject of international negotiations towards a global treaty aimed, among other things, at stopping their flow into the ocean;
 industrial and domestic effluents, as well as mine tailings and agricultural runoff;
 biologically active materials, such as excess nutrients, fecal bacteria, pathogens, and antimicrobial resistant bacteria;
 suspended sediments;
 natural and artificial radionuclides;
 energy, including noise and light⁶⁶⁶.

The recognition of the threat posed by pollutants to the ocean is fairly recent outside of scientific circles, with the prevailing belief that dilution could be a solution to pollution – especially due to the vastness of ocean waters. However, as early as the 1970s, scientists had started to document the impacts of nutrient over-enrichment in coastal waters around the world, driven by the sharp rise in the use of synthetic fertilisers⁶⁶⁷.

Following that, thanks to ocean science, evidence of coastal contamination by other pollutants, such as heavy metals, polychlorinated biphenyls (PCBs), and petroleum compounds, quickly emerged⁶⁶⁸.

In this regard, the white paper also stresses that while marine pollution can be localised, some pollutants – like mercury (Hg), POPs, plastics, and certain radionuclides – can be transported globally beyond borders, accumulating in areas far from their sources⁶⁶⁹.

When it comes to plastics, more precisely, without further mitigation efforts, legacy plastics will continue to break down into secondary microplastics for decades. This “fragmentation gap” is currently overlooked in global policy targets⁶⁷⁰. Figure 20 summarises the sources, pollutants and impacts of ocean pollution:

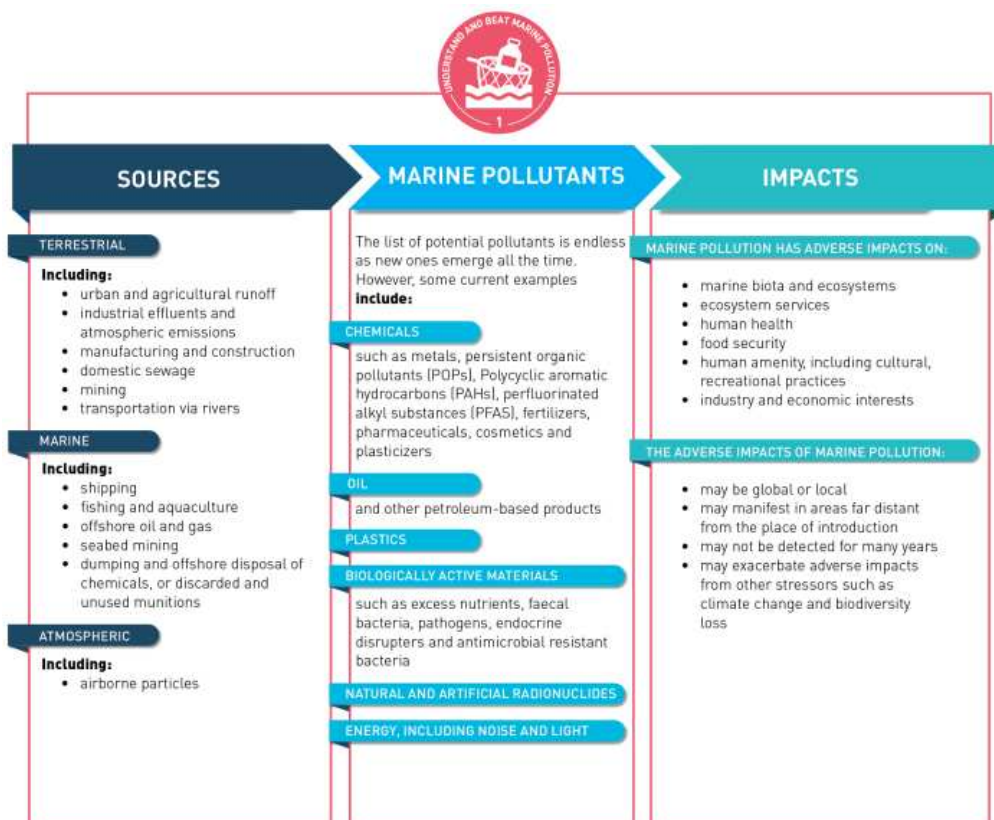
⁶⁶⁶ Hatje, V.; *et. al.* (2024). *Ob. cit.*, p. 10.

⁶⁶⁷ The study of plastics in the ocean dates back to research conducted in the 1970s on the Sargasso Sea (Carpenter; Smith, 1972). *Cfr. supra*, note 609.

⁶⁶⁸ IOC-UNESCO (2020b). *Ob. cit.*, p. 181.

⁶⁶⁹ Hatje, V.; *et. al.* (2024). *Ob. cit.*, p. 10.

⁶⁷⁰ As plastic debris break down into microplastics, the concentration of secondary microplastics at the ocean surface is likely to keep rising for decades, even with policies that stabilise or reduce the influx of plastic debris into the ocean. In: Kvale, K.; *et. al.* (2024). Mind the fragmentation gap. **Nature Communications**, vol. 15, p. 1. DOI: <https://doi.org/10.1038/s41467-024-53962-3>. Available at: <https://www.nature.com/articles/s41467-024-53962-3>. Accessed on 12 January 2025.

Figure 20 – Sources and impacts of marine pollution⁶⁷¹

Source: Hatje, V.; *et al.* (2024). **Ocean Decade Vision 2030 White Papers** – Challenge 1: Understand and Beat Marine Pollution. Paris, UNESCO-IOC.

A large portion of dumpsites⁶⁷² are located on or near coastlines, where they can release persistent, bio accumulative, and toxic chemicals like PCBs, along with plastics and other types of waste, into coastal and marine ecosystems. The risks posed by these dumpsites are intensified by climate change, including higher temperatures, rising sea levels, and more frequent and severe storms⁶⁷³.

Nonetheless, in the context of the Ocean Decade, Challenge 1 is notably one of the under-represented challenges when it comes to the Decade Actions⁶⁷⁴ – which

⁶⁷¹ Hatje, V.; *et al.* (2024). *Ob. cit.*, p. 11.

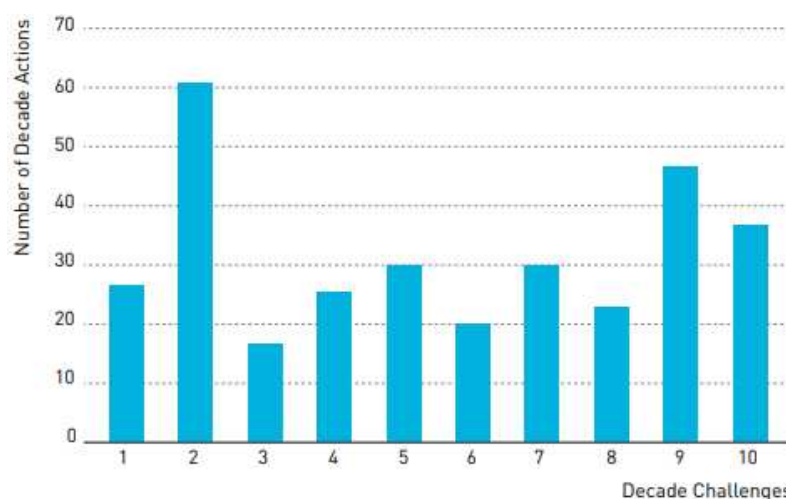
⁶⁷² Locations where collected waste is deposited in a central area, but where the waste is not managed with daily, intermediate, or final cover, allowing the top layer to escape into the natural environment through wind and surface water.

⁶⁷³ UNEP (2024a). **Global Waste Management Outlook 2024**: Beyond an age of waste – Turning rubbish into a resource. Nairobi, p. 29. DOI: <https://doi.org/10.59117/20.500.11822/44939>. Available at: <https://www.unep.org/resources/global-waste-management-outlook-2024>. Accessed on 11 January 2025.

⁶⁷⁴ The Ocean Decade Actions encompass 4 different levels of action. The first is a Decade programme, which is generally global or regional in scope and aims to contribute to the achievement of one or more of the Ocean Decade Challenges. It is long-term (spanning multiple years), interdisciplinary, and consists of various component projects, along with potentially enabling activities. Second, a Decade project is a specific, focused initiative, which may be regional, national, or subnational. It typically contributes to a designated Ocean Decade programme. Third, a Decade activity is a standalone, one-time event (such as an awareness-raising campaign, a scientific workshop, or a training session). It either supports a programme

encompass the endeavours that a broad spectrum of Decade stakeholders will carry out in order to accomplish the Decade Goals and, consequently, the Challenges – both at the Programme and Contribution levels, with below-average representation at the Project level⁶⁷⁵, as Figure 21 highlights:

Figure 21 – Challenge distribution for endorsed Decade Actions⁶⁷⁶



Source: IOC-UNESCO (2025). Ocean Decade Progress Report 2023-2024. UNESCO, Paris. (The Ocean Decade Series, 53).

Ocean Decade Actions must follow a hierarchy and an endorsement process, considering that various levels of programs, projects, activities, and/or contributions are being implemented, as Figure 22 illustrates:

or project or directly contributes to an Ocean Decade Challenge. Finally, the fourth level are the Decade contributions, which aid the Ocean Decade by providing essential resources (such as funding or in-kind support). Contributions can help implement an Ocean Decade Action or cover coordination costs for the Ocean Decade. In: IOC-UNESCO (2021). *Ob. cit.*, p. 21-26.

⁶⁷⁵ As of November 2023, there are 3 Programmes, 26 Projects, and 4 Contributions (collectively referred to as “Actions”) directly focused on tackling Challenge 1. However, marine pollution may also be addressed, either directly or indirectly, by other Actions, including those related to ocean observing, prediction, and data sharing. In: Hatje, V.; *et. al.* (2024). *Ob. cit.*, p. 12.

⁶⁷⁶ IOC-UNESCO (2025). Ocean Decade Progress Report 2023-2024. UNESCO, Paris. (The Ocean Decade Series, 53), p. 11. Available at: <https://unesdoc.unesco.org/ark:/48223/pf0000392445>. Accessed on 29 January 2025.

Figure 22 – Endorsement process for Ocean Decade Actions⁶⁷⁷

Source: IOC-UNESCO (2021). The United Nations Decade of Ocean Science for Sustainable Development (2021-2030) Implementation Plan.

Many Projects categorised under Challenge 1, however, are isolated, functioning as “orphan” projects without a connection to a coordinated host Programme. While Asia, Europe, and North America are represented at the Programme level, there is a significant lack of Programmes in other regions⁶⁷⁸. At the Project level, major gaps are particularly evident in the Latin America and Australia/Pacific regions. Most critically, Small Island Developing States (SIDS) have no representation in Actions related to Challenge 1 so far⁶⁷⁹.

In terms of content, current Actions are primarily focused on just three thematic areas: noise pollution, plastics, and organic pollutants. Plastic pollution is only addressed at the Project level, with no specific overarching Programme dedicated to the issue. Despite these efforts, critical aspects such as partnerships, resource allocation, and a comprehensive approach to addressing plastic pollution at its source are not, or are only peripherally, addressed within these Projects⁶⁸⁰.

This is very relevant, because when it comes to marine plastic pollution – beyond regulation –, community governance and bottom-up approaches cannot be overstated.

⁶⁷⁷ IOC-UNESCO (2021). *Ob. cit.*, p. 27.

⁶⁷⁸ Hatje, V.; *et. al.* (2024). *Ob. cit.*, p. 12-13.

⁶⁷⁹ Only 6% and 2.3% of Decade Actions are led by local institutions in Africa and SIDS, respectively, despite the fact that these regions are implementing 15–20% of them. In: IOC-UNESCO (2025). *Ob. cit.*, p. 12.

⁶⁸⁰ Projects in this area focus on developing datasets on plastic waste distribution, increasing understanding of its impacts, and establishing necessary infrastructure, including capacity-building efforts to support countries in developing plastic waste management solutions. In: Hatje, V.; *et. al.* (2024). *Ob. cit.*, p. 13.

Community action has led to several beneficial advances in the reduction of marine plastic pollution. The application of “citizen science” and education improves community involvement and alters the behaviour of individuals participating in the usage and removal of plastics from the marine environment. Where legislation is lagging, local groups and nonstate actors are leveraging social license to drive change⁶⁸¹.

To achieve sustainable development collaborative and proactive efforts are required in order to reduce or eliminate pollution sources and mitigate their effects on both ecosystems and human health and well-being. This also involves minimising the economic consequences of marine pollution, including direct costs to industries and coastal communities, as well as the indirect costs to degraded ecosystems. As countries work to grow and sustainably expand their blue economies in line with SDG 14 (specifically targets 14.1 and 14.2)⁶⁸², it is crucial to ensure that this “blue acceleration”⁶⁸³ does not lead to the introduction of new or different forms of pollution.

Reaching this goal will necessitate the development of integrated, coordinated, cross-sectoral regulatory strategies that balance the sustainable use of the ocean with its protection and the promotion of health and well-being (SDG 3). These strategies must be grounded in scientifically accurate data and a comprehensive understanding of the scale and impact of marine pollution across the land-ocean continuum⁶⁸⁴.

Despite all these constructive and voluntary efforts, the remaining gaps only highlight how much a regime entirely dedicated to combating (marine) plastic pollution is necessary. In this regard, the UNGA recently adopted by vote the landmark annual Resolution *Oceans and the Law of the Sea*, where important aspects were raised. For instance, the resolution recalled

(...) that, in “The future we want”, States noted with concern that **the health of oceans and marine biodiversity are negatively affected by marine pollution**, including marine debris, **especially plastic, persistent organic pollutants**, heavy metals and nitrogen-based compounds, from a number of marine and land-based sources, including shipping and land run-off, and that **States committed to take action to reduce the incidence and impacts of such pollution on marine ecosystems**, and encourages States, in accordance with the commitment expressed in this regard, and based on collected scientific

⁶⁸¹ Stoett, P.; Vince, J. (2019). *Ob. cit.*, p. 351-352.

⁶⁸² Hatje, V.; *et. al.* (2024). *Ob. cit.*, p. 13.

⁶⁸³ Blue acceleration refers to the growing demand for ocean resources and space as land-based sources decline. As expectations for the ocean as a driver of human development rise, there is an increasing race among various, often competing, interests to access ocean food, materials, and space. This phenomenon is characterised by the unprecedented scale, intensity, and variety of aspirations for ocean resources. In: Jouffray, J.B.; *et. al.* (2020). The Blue Acceleration: The Trajectory of Human Expansion into the Ocean. *One Earth*, vol. 2, n. 1, p. 43. DOI: <https://doi.org/10.1016/j.oneear.2019.12.016>. Available at: <https://www.sciencedirect.com/science/article/pii/S2590332219302751>. Accessed on 13 March 2023.

⁶⁸⁴ Hatje, V.; *et. al.* (2024). *Ob. cit.*, p. 13.

data, **to take action by 2025 to achieve significant reductions in marine debris to prevent harm to the coastal and marine environment;** (...)

(...) the decision of the United Nations Environment Assembly to convene an intergovernmental negotiating committee to develop an international legally binding instrument on plastic pollution, including in the marine environment, based on a comprehensive approach and with the ambition of completing its work by the end of 2024 in line with the mandate of United Nations Environment Assembly resolution 5/14, (...)

(...) to further develop partnerships with Indigenous Peoples, local communities, including coastal communities, industry and civil society to **raise awareness of the extent of the impact of marine debris on the biological diversity, health and productivity of the marine environment** and consequent **economic loss** and to cooperate with other States, Indigenous Peoples, local communities, including coastal communities, industry and civil society, as appropriate, on **environmentally sound and cost-effective measures to prevent and reduce, as appropriate, marine debris and microplastics in the marine environment**, including through strengthened cooperation under the Global Partnership on Plastic Pollution and Marine Litter; (...) ⁶⁸⁵. (*author's emphasis*)

The current scenario, therefore, demonstrates how much discussions cantered on the ocean, and its resilience are on the agenda. It is also worth mentioning that in addition to the Ocean Conferences⁶⁸⁶ and the Ocean Decade, several other forums for discussions on ocean, marine pollution and governance have been developed over the years.

Importantly, the IMDCs are the leading global event focused on understanding and promoting actions to tackle marine debris, or marine litter⁶⁸⁷. The origins of the first IMDC date back to the 1980s, when the increasing recognition of plastic waste accumulation in marine ecosystems and its impact on marine life led the Marine Mammal Commission⁶⁸⁸ to contact the US National Marine Fisheries Service in 1982 to organise a workshop on the issue⁶⁸⁹.

Due to the severity of the problem in the North Pacific Ocean, the responsibility for this initiative was assigned to the Honolulu Laboratory of the Southwest Fisheries Center. The Workshop on the Fate and Impact of Marine Debris was held in late

⁶⁸⁵ UNGA (2024). **Oceans and the law of the sea**. Seventy-ninth session Agenda item 75 (a) (A/79/L.37). Available at: <https://docs.un.org/en/A/79/L.37>. Accessed on 07 January 2025.

⁶⁸⁶ In fact, the fourth UN Ocean Conference (IV UNOC) is scheduled for 2028 and will be jointly hosted by Chile and the Republic of Korea. In: UN (2025c). UN Ocean Conference delivers unified call to action and strong commitments. Available at: <https://www.un.org/en/desa-en/UNOC3-delivers-unified-call-to-action>. Accessed on 11 August 2025.

⁶⁸⁷ IMDC (2023). International Marine Debris Conference – History of the International Marine Debris Conference (IMDC). Available at: <https://internationalmarinedebrisconference.org/>. Accessed on 12 June 2024.

⁶⁸⁸ Which is an independent agency of the Government of the USA. In: NFWF (2020). Marine Mammal Commission. The National Fish and Wildlife Foundation (NFWF) – Federal & State Partners. Available at: <https://www.nfwf.org/partnerships/federal-state-partners/marine-mammal-commission>. Accessed on 17 September 2024.

⁶⁸⁹ Ryan, P.G. (2015). *Ob. cit.*, p. 12.

November 1984, with 125 participants from eight countries in attendance⁶⁹⁰.

The workshop highlighted the importance of increasing awareness about the threat of marine litter and proposed three key mitigation actions: regulating the disposal of high-risk plastic items, promoting the recycling of fishing nets, and exploring the use of biodegradable materials in fishing gear. Building on the success of the first marine debris workshop, plans were made for a second IMDC⁶⁹¹.

The 2nd IMDC was held once again in Honolulu in April 1989, drawing over 170 delegates from 10 countries. This conference had a broader scope than the first, featuring seven themed sessions following a series of regional overview papers. While the first IMDC primarily focused on the quantity and impacts of marine debris, the second placed greater emphasis on addressing the issue, with sessions covering solutions through technology, law and policy, education, and the first estimates of the economic costs of marine litter⁶⁹².

Regarding marine debris law and policy, it is very interesting to note that there was a Working Group specifically dedicated to reviewing legal and institutional instruments

to curtail the disposal and loss of solid wastes into the marine environment. The group concluded that **solutions to the problem** of marine debris **should be developed and implemented in concert with efforts to address broader solid waste management issues**. The most pressing needs identified include: (1) **expanding participation to relevant international agreements**; (2) assuring that adequate port reception facilities are available at all ports and harbors to receive ship-generated garbage returned to shore; and (3) **adopting national policies and programs**, such as recycling and innovative packaging, to reduce quantities of generated solid waste.

The group identified **two international agreements as being of greatest importance to the problem of marine debris**: MARPOL Annex V and the London Dumping Convention (formally known as the International Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter). In addition, at least 10 regional conventions control various forms of pollution, including the disposal of plastics and other solid wastes into the marine environment. The working group concluded that these international conventions establish the prohibition of disposing of plastics and other solid materials into the sea as “customary international law”.

The group recognized that control of land-based sources of marine debris is a difficult problem that must be **addressed domestically by individual nations**. For example, it recommended that governments encourage **recycling programs to reduce the volume of material that becomes solid waste**.

⁶⁹⁰ NOAA (1985). Proceedings of the Workshop on the Fate and Impact of Marine Debris, 27-29 November 1984, Honolulu, Hawaii. Shomura, Richard S.; Yoshida, Howard O. (Editors). Available at: <https://repository.library.noaa.gov/view/noaa/5680>. Accessed on 19 September 2023.

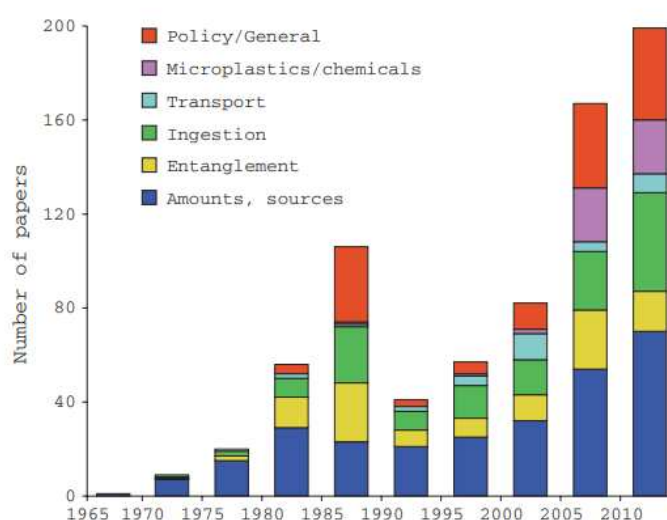
⁶⁹¹ Ryan, P.G. (2015). *Ob. cit.*, p. 13.

⁶⁹² NOAA (1990). Proceedings of the Second International Conference on Marine Debris, 2-7 April 1989, Honolulu, Hawaii. Shomura, Richard S.; Godfrey, Mary Lynne (Editors). Available at: <https://repository.library.noaa.gov/view/noaa/6012>. Accessed on 16 September 2023.

Regarding compliance and enforcement, the working group recommended that the International Maritime Organization and pertinent governments party to MARPOL Annex V develop incentives to encourage vessels owners and operators to **comply with garbage disposal regulations**, and that vessel owners and operators be encouraged to report ports and harbors that do not have required port reception facilities⁶⁹³. (*author's emphasis*)

The first two IMDCs played a crucial role in gathering information on the marine debris issue. The extensive number of papers presented in the proceedings led to a significant increase in publications on the topic, as Figure 23 demonstrates:

Figure 23 – Papers on different aspects of the marine litter issue published in five-year intervals⁶⁹⁴



Source: Ryan, P.G. (2015). A Brief History of Marine Litter Research. In: **Marine Anthropogenic Litter**. Editors Bergmann, M., Gutow, L., Klages, M. Springer, Cham.

Since then, five more conferences have been held. In 2011, the UNEP partnered with NOAA to co-host the 5th IMDC – continuing their involvement ever since. Held in Honolulu, Hawaii, the conference brought together over 450 participants from the marine debris community⁶⁹⁵ to develop the Honolulu Strategy, which is a landmark framework designed to guide a comprehensive, global effort to reduce the ecological, human health, and economic impacts of marine debris⁶⁹⁶.

The 6th IMDC in 2018 saw more than 700 attendees from over 50 countries come together to share lessons learned, foster international dialogue, exchange ideas, and discuss research methods and findings. The conference brought together a global

⁶⁹³ Ryan, P.G. (2015). *Ob. cit.*, p. 13.

⁶⁹⁴ *Ibid.*, p. 3.

⁶⁹⁵ UNEP (2011c). 5th International Marine Debris Conference. 20-25 March 2011, Hawaii. Available at: <https://www.unep.org/nowpap/news-and-stories/story/5th-international-marine-debris-conference>. Accessed on 17 October 2022.

⁶⁹⁶ As previously analysed in Section I, Subsection B of this Chapter.

community committed to achieving a marine debris-free ocean, focusing on celebrating and encouraging innovation, collaboration, and action⁶⁹⁷.

It highlighted advancements in marine debris solutions, research, and technology since the 5th IMDC, and facilitated discussions on strategies to reduce the impacts and occurrence of marine debris. A key strength of the conference was its diverse range of disciplines and expertise, encompassing science, art, outreach, and education, with participants from government, academia, private industry, and community groups⁶⁹⁸.

The 7th IMDC in 2022 marked the first time the conference was held outside the United States. Co-hosted by the Republic of Korea's Ministry of Oceans and Fisheries and UNEP, with technical support from NOAA and the Korea Marine Environment Management Corporation, the event brought together over 1.000 participants from 89 countries⁶⁹⁹.

The conference featured more than 100 technical sessions, with nearly 600 abstract presentations⁷⁰⁰ and over 200 posters displayed, engaging a wide range of sectors including academia, NGOs, governments, and the private sector⁷⁰¹.

Based on the analysis of these conferences, initiatives and commitments, it is evident that there has been a growing emphasis on the ocean – although, as seen, this is not a new concern, having emerged between the 1970s and increased in the 1980s – as demonstrated by several key developments. These include, for instance, the inclusion of SDG 14 as a stand-alone goal in the 2030 Agenda, the launch of the UNOCs, the establishment of the Ocean Decade and the appointment of the UN Secretary-General's Special Envoy for the Ocean⁷⁰².

⁶⁹⁷ UNEP (2018d). 6th International Marine Debris Conference. San Diego, CA, 12-16th March 2018. Available at: <https://www.unep.org/nowpap/news-and-stories/story/6th-international-marine-debris-conference>. Accessed on 13 November 2022.

⁶⁹⁸ UNEP; NOAA (2018). Sixth International Marine Debris Conference – Conference Proceedings. March 12-16, 2018 San Diego, California, USA. Available at: https://internationalmarinedebrisconference.org/wp-content/uploads/2018/06/Sixth_International_Marine_Debris_Conference_Proceedings.pdf. Accessed on 17 November 2022.

⁶⁹⁹ UNEP (2022g). The 7th International Marine Debris Conference (7IMDC). 18 - 23 September 2022, Busan, Republic of Korea. Available at: <https://www.unep.org/events/unep-event/7th-international-marine-debris-conference-7imdc>. Accessed on 19 November 2023.

⁷⁰⁰ One of them was presented by this author, entitled “The development of an International Regime for Marine Plastic Pollution: fulfilling legal gaps to strengthen Ocean Resilience”. For more, *see* Leitão, A.I.B.L.S.; Mont'Alverne, T.C.F. (2022). The development of an International Regime for Marine Plastic Pollution: fulfilling legal gaps to strengthen Ocean Resilience. TS-5.10: Turning Off the Tap - The Road to an Effective Global Plastics Treaty. Available at: <https://7imdc.exordo.com/programme/presentation/516>. Accessed on 13 January 2025.

⁷⁰¹ The 7th IMDC had hybrid elements and provided options for remote attendance due to Covid-19.

⁷⁰² In 2017, UN Secretary-General António Guterres appointed Ambassador Peter Thomson of Fiji as his Special Envoy for the Ocean. The appointment aimed to mobilise coordinated efforts to build on the

The inclusion of a specific target for marine governance within SDG 14 highlights the significant importance the international community places on this issue. Clearly, effective ocean governance is crucial for protecting marine ecosystems and managing human activities in the ocean. Additionally, it is vital to ensure equitable access to ocean resources, both between countries and for individuals of varying income levels within countries⁷⁰³.

Enhancing ocean governance is crucial for promoting collaboration across sectors and minimising conflicts among stakeholders – as the ocean is governed by a wide range of actors, including formal and informal institutions, as well as nation-states, each with differing and often conflicting objectives and uses⁷⁰⁴.

It is, thus, important for ocean governance to integrate political economy perspectives. A well-established governance framework not only supports sustainable management but also reduces investment risks, thereby encouraging financial support for maritime sectors⁷⁰⁵.

Ocean governance is complex and multi-layered. Although some hierarchy exists, there is often overlap between global and regional multilateral agreements, political and voluntary commitments, and various treaties⁷⁰⁶.

As a result, effective ocean governance requires coordination among different actors, including governments and non-state entities, through diplomatic channels such as bilateral or multilateral mechanisms, as well as soft law⁷⁰⁷.

There are many key gaps in ocean governance. Current frameworks do not adequately address the challenges posed by climate change, and the integration of land-sea interactions remains limited⁷⁰⁸.

Additionally, there are significant knowledge gaps in scientific understanding of

outcomes of the first UNOC and sustain the momentum for actions that conserve and sustainably manage the ocean, seas, and marine resources for sustainable development. In: UN (2017d). Peter Thomson, UN Secretary-General's Special Envoy for the Ocean. Available at: <https://sdgs.un.org/topics/oceans-and-seas/SpecialEnvoy>. Accessed on 13 March 2023.

⁷⁰³ Kedia, S.; Narula, K. (2022). Oceans and Seas for Sustainable Development: Challenges of global environmental change for SDG14. In: **Routledge Handbook of Marine Governance and Global Environmental Change**. 1st Edition, Routledge: London. ISBN: 9781315149745, 342p. Edited by Paul G. Harris. Available at: <https://www.taylorfrancis.com/books/edit/10.4324/9781315149745/routledge-handbook-marine-governance-global-environmental-change-paul-harris>. Accessed on 14 April 2023.

⁷⁰⁴ Haas, B.; *et. al.* (2022). The future of ocean governance. **Reviews in Fish Biology and Fisheries**, vol. 32, p. 254. DOI: <https://doi.org/10.1007/s11160-020-09631-x>. Available at: <https://link.springer.com/article/10.1007/s11160-020-09631-x>. Accessed on 22 June 2023.

⁷⁰⁵ Kedia, S.; Narula, K. (2022). *Ob. cit.*, p. 292.

⁷⁰⁶ International treaties, regional agreements, and national policies often involve complex design, development, and implementation processes that aim to achieve specific objectives. In: Haas, B.; *et. al.* (2022). *Ob. cit.*, p. 255.

⁷⁰⁷ Kedia, S.; Narula, K. (2022). *Ob. cit.*, p. 292.

⁷⁰⁸ Haas, B.; *et. al.* (2022). *Ob. cit.*, p. 257-259.

marine ecosystems, the impact of maritime activities (particularly in benthic regions and the deep sea), as well as the effects of installing and decommissioning permanent infrastructure at sea⁷⁰⁹.

A common challenge across countries is the extension of terrestrial legislation to offshore activities, or the failure to translate international laws into national regulations. The implementation and enforcement of laws remain weak due to limited monitoring capacity and resources⁷¹⁰.

In addition to these gaps, there are jurisdictional and regulatory overlaps in ocean governance, particularly in marine areas where different actors and stakeholders compete due to sector-based approaches⁷¹¹.

The overlap between treaties and regulations, as well as between national, regional, and international legislation and the sectoral use of ocean resources, presents a significant challenge. While the fragmented nature of ocean governance and overlapping measures can sometimes provide multiple layers of environmental protection⁷¹², these mechanisms are often dysfunctional, incoherent, and fail to adopt an ecosystem-based approach to the maritime domain⁷¹³.

Multilateral efforts, international processes, and forums aimed at strengthening ocean governance are emerging, including the development of an international LBI, as it is further analysed in this thesis.

⁷⁰⁹ Kedia, S.; Narula, K. (2022). *Ob. cit.*, p. 292.

⁷¹⁰ Rudolph, T.B.; *et. al.* (2020). A transition to sustainable ocean governance. **Nature Communications**, vol. 11, p. 7. DOI: <https://doi.org/10.1038/s41467-020-17410-2>. Available at: <https://www.nature.com/articles/s41467-020-17410-2>. Accessed on 09 June 2023.

⁷¹¹ Kedia, S.; Narula, K. (2022). *Ob. cit.*, p. 292.

⁷¹² Nwabueze, J.N.; Techera, E. (2021). *Ob. cit.*, p. 228-229.

⁷¹³ Kedia, S.; Narula, K. (2022). *Ob. cit.*, p. 293.

Synthesis of the chapter

This chapter explores the growing issue of marine pollution and analyses the various international treaties, voluntary commitments, and global initiatives that aim to prevent, reduce, and manage pollution in marine ecosystems. Emphasising the need for integrated governance and coordinated action, the chapter delves into both legal frameworks and non-binding efforts that collectively seek to protect the ocean from the ever-increasing pressure of pollutants. These efforts highlight the complexity of ocean governance and underscore the need for collaborative strategies across different sectors and regions.

The chapter starts by examining several international treaties designed to tackle the multifaceted issue of marine pollution, each of which contributes to regulating the discharge of pollutants into the marine environment. In this regard, Table 1 summarises the analysis conducted:

Table 1 – General Analysis of International Treaties

Treaty	General analysis
United Nations Convention on the Law of the Sea	When it comes to marine plastic pollution, UNCLOS does not provide specific, comprehensive provisions for plastics. Although it addresses pollution in general, it lacks targeted measures for plastic waste, particularly microplastics, and their long-term environmental impacts. Its provisions on pollution prevention largely focus on oil spills and other pollutants, leaving a gap in addressing plastics as a distinct and urgent issue.
Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal	While the Basel Convention addresses hazardous waste, it does not specifically focus on plastic pollution, particularly plastic waste that is not classified as hazardous. Plastic waste – such as consumer products or packaging – often escapes the framework because it does not meet the hazardous criteria, leaving a significant gap in its ability to manage the global movement of plastic waste.
Stockholm Convention on Persistent Organic Pollutants	While the Convention has made strides in addressing toxic chemicals, plastics are not explicitly covered. Some plastics, such as those containing POPs (e.g., certain additives or byproducts of plastic degradation), may fall under its scope, but the Convention lacks a clear and comprehensive approach to plastic pollution, especially considering the wide variety of plastic materials that persist in the environment and their fragmentation into microplastics.
Rotterdam Convention on the Prior Informed Consent Procedure for the International Trade in Certain Hazardous Chemicals and Pesticides	This Convention focuses on promoting transparency and the exchange of information regarding hazardous chemicals and pesticides. It seeks to ensure that importing countries are aware of the risks of chemicals they are importing. Plastic

	materials themselves are not directly regulated by the Rotterdam Convention, though certain chemicals used in plastics (like plasticisers or flame retardants) may fall under its scope if they pose a significant risk. However, the Convention does not specifically address plastic waste or pollution, leaving a gap in the international management of plastic materials beyond their chemical components.
Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter and 1996 London Protocol	The protocols focus on various pollutants, such as dredged material, sewage sludge, and hazardous waste. However, plastics, particularly non-hazardous plastic waste, remain a significant gap in the London Convention's regulations. Although plastic dumping is generally prohibited, the volume of plastic waste continues to increase in the ocean, and the provisions of the London Convention do not address the systemic problem of plastic pollution – especially from land-based sources or through the degradation of plastics into microplastics.
International Convention for the Prevention of Pollution from Ships	MARPOL is a key international treaty that aims to prevent pollution from ships, including oil, sewage, garbage, and chemicals. While MARPOL includes provisions on ship-generated waste, it does not adequately address the problem of plastic waste from ships. The Convention primarily focuses on the prevention of oil and chemical pollution, and though there are some provisions related to garbage disposal (including plastics), it does not address the broader challenge of plastic pollution entering the marine environment, particularly plastics not related to ship operations. Furthermore, enforcement of its rules remains uneven across jurisdictions, resulting in the persistence of illegal dumping practices and inadequate waste management.
Convention on Biological Diversity	The CBD focuses on the conservation of biological diversity, including marine ecosystems, and addresses the impacts of pollution on biodiversity. Plastic pollution is not directly targeted by the CBD, although its impact on marine species and ecosystems is acknowledged. While plastics contribute significantly to habitat degradation and species endangerment, the Convention lacks concrete mechanisms or guidelines that specifically target the reduction and management of marine plastic pollution in the context of protecting biodiversity.
Convention on the Conservation of Migratory Species of Wild Animals	The CMS aims to protect migratory species across their range and to promote international cooperation in their conservation. Plastics have a significant impact on migratory species, particularly marine species that ingest plastic debris. However, the CMS does not have specific provisions or targeted actions to address plastic pollution as a direct threat to migratory species. While plastics pose a known risk, the CMS lacks a dedicated framework for plastics management in its broader conservation efforts.
Convention on the Law of the Non-navigational Uses of International Watercourses and	Both the UNWC and the UNECE Water Convention deal with the protection and

Convention on the Protection and Use of Transboundary Watercourses and International Lakes Water Convention	management of transboundary water resources. These conventions primarily focus on freshwater systems and the management of watercourses, rather than marine ecosystems. Plastics entering oceans via rivers – a key source of marine plastic pollution – are not comprehensively addressed by these conventions. They are both largely focused on water quality and the prevention of pollution from chemicals, heavy metals, and other substances, but they fail to provide specific measures for addressing the flow of plastics through freshwater systems into the ocean.

These treaties represent the legal foundation for the global efforts to address marine pollution, each contributing to managing pollutants from different sources while protecting marine and coastal ecosystems – despite this, they are still not sufficient to address the complexity of the problem of MPP, which becomes evident when identifying the various gaps still present in each one.

This chapter primarily identified factual gaps, which are summarised in Table 2 below:

Table 2 – Factual Gaps Identified in Key International Instruments

Factual Gap	Instrument
Substantive Gaps: these occur when no specific instrument exists to comprehensively address marine plastic pollution.	UNCLOS: lacks specific provisions for plastics, particularly microplastics, and fails to address plastics as a distinct issue.
	Basel Convention: while addressing hazardous waste, does not specifically target plastic waste, especially non-hazardous plastics such as packaging or consumer products.
	CBD: does not have concrete mechanisms for managing marine plastic pollution, despite acknowledging its impact on biodiversity.
Legal Gaps: these exist when guidelines or instruments exist but lack binding legal force.	Many existing conventions (such as the Basel Convention and MARPOL) address certain aspects of marine pollution but lack binding legal force on plastic waste specifically or fail to provide strong compliance mechanisms for plastic pollution management.
Geographic Gaps: these relate to the geographic limitations of certain instruments.	Conventions like the UNWC and UNECE Water Convention focus on freshwater systems and watercourses but do not address plastics entering oceans via rivers, which is a key source of marine plastic pollution.
Institutional Gaps: these arise when there is a lack of designated institutions or bodies tasked with managing specific issues.	While there are multiple instruments and agreements that touch upon (marine) plastic pollution, none of them have a dedicated body or institution responsible for coordinating efforts to address marine plastic pollution comprehensively.
Compliance/Enforcement Gaps: these refer to weak or non-existent compliance and enforcement mechanisms.	Many of the conventions analysed, such as the London Convention and MARPOL, have provisions related to plastic pollution but lack strong enforcement mechanisms or clear actions that could reduce the ongoing increase in plastic waste in the ocean.

In addition to the factual gaps, there are other policy gaps – for instance, that is not even a universally agreed-upon definition of plastic waste, despite plastics being addressed in various international and supranational waste agreements.

These include the Basel Convention and the London Convention, as analysed, but also other instruments such as the EU Waste Framework Directive (2008/98/EC)⁷¹⁴. The lack of a clear definition of plastic waste has not been a prominent issue – likely because legal definitions of waste and chemical specifications or characteristics for different plastic types already exist – however, for effective regulatory implementation, it is essential to understand the various plastic types and their distinct lifespan attributes to ensure proper treatment and management.

In addition to the binding instruments, the chapter highlights several voluntary commitments and global frameworks that further contribute to addressing marine pollution, as summarised in Table 3:

Table 3 – General Analysis of Voluntary Commitments

Voluntary Commitment	General analysis
The Global Programme of Action	The GPA is a global initiative to protect the marine environment from land-based activities, addressing a wide array of pollutants, including plastics. However, while the GPA addresses plastics as part of a broader category of land-based pollution, its ability to address the full extent of PWM, reduction, and prevention is limited, particularly because it lacks legally binding obligations and mechanisms for enforcement at the international level.
Honolulu Strategy	The Honolulu Strategy aims to reduce the ecological, human health, and economic impacts of marine debris, including plastics. However, the Strategy focuses largely on mitigation and management, with less emphasis on the prevention of plastic pollution at its source. Furthermore, its voluntary nature means that implementation and accountability are weak, and it relies on the engagement of various stakeholders without enforceable commitments.
FAO Code of Conduct for Responsible Fisheries	The FAO Code of Conduct promotes responsible fisheries management and practices that reduce environmental impacts, including marine debris. However, it does not specifically address plastic pollution from fisheries, such as plastic nets, lines, and waste generated by fishing activities, leaving a gap in addressing plastics from this sector.
Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection	GESAMP provides scientific guidance on marine pollution, including plastics. While it contributes with valuable research, it lacks the authority to impose

⁷¹⁴ More on EU regulation is provided in the next Chapter.

	regulatory actions, leaving a gap in translating scientific findings into global policy and practical solutions for plastic pollution management.
G20 Action Plan on Marine Litter	The G20's Action Plan on Marine Litter is a significant step toward tackling marine plastic pollution. Its voluntary nature and the lack of binding commitments from all member states, however, means that efforts remain inconsistent, and its implementation is subject to national priorities and capacity, all of which limit its global impact.
World Trade Organization	While the WTO promotes international trade and economic cooperation, it does not address marine plastic pollution directly. Trade agreements and global commerce contribute to plastic waste, yet the WTO has not implemented mechanisms to curtail the trade of plastic products or incentivise trade policies that reduce plastic pollution.
Strategic Approach to International Chemicals Management	SAICM aims to promote the sound management of chemicals worldwide. While it touches on hazardous chemicals used in plastic production, it does not directly address the global problem of plastic pollution. The lack of specific actions regarding PWM and the lifecycle of plastics remains a gap in addressing the environmental impacts of plastics.

Although non-binding, these voluntary commitments offer significant support to States, industry, and other non-governmental actors. They encourage the implementation or adherence to established standards and facilitate initiatives that promote a life cycle approach to plastic management.

Briefly, they reflect the growing recognition of the need for collaborative action beyond legally binding treaties and complement existing frameworks by promoting innovation, sharing best practices, and strengthening international cooperation on marine pollution prevention. Still, they are not enough to fill the gaps identified in international law.

The chapter also provides insights into the importance of the MDGs and how they guided global development efforts until 2015 – although they did not specifically target ocean health or marine pollution, especially plastics. Differently, the 2030 Agenda for Sustainable Development – built upon the MDGs – explicitly introduced SDG 14, which focuses on “life below water”. This goal is a key framework for promoting the sustainable use of the ocean, seas, and marine resources, specifically targeting the reduction of marine pollution, including plastics, and ensuring the protection of marine ecosystems.

The 2030 Agenda presents a more comprehensive framework for addressing the link between sustainable development and marine pollution, placing strong emphasis on the need for global efforts to reduce plastic pollution and enhance ocean governance,

aligning well with efforts to address plastics under various treaties and voluntary commitments.

SDG 14, particularly target 14.1, is focused on the reduction of marine pollution, explicitly addressing plastics as a significant threat to marine ecosystems and human health. This target calls for urgent action to significantly reduce marine pollution from plastic debris, including microplastics, which have become a widespread environmental and public health concern. While SDG 14 underscores the importance of combating plastic pollution, there remain gaps in translating these goals into binding, enforceable actions across nations and sectors. Thus, further strengthening of international legal and governance frameworks is required to fully implement SDG 14's targets.

In essence, the 2030 Agenda and SDG 14 foster an integrated, holistic and multi-dimensional approach to addressing marine plastic pollution, harmonising efforts across environmental, social, and economic dimensions. This alignment enhances the synergies between global environmental agendas and supports inclusive, sustainable development.

In this scenario, the Ocean Decade aims to generate scientific knowledge and facilitate actions that will help reduce marine pollution, including plastics. The Decade is aligned with SDG 14 and calls for a more integrated approach to ocean science, focusing on monitoring and improving the state of the ocean, while addressing the threats posed by pollutants such as plastics. Despite its potential, the Ocean Decade faces many challenges.

The chapter highlights that Challenge 1 of the Ocean Decade, which focuses on understanding and mitigating marine pollution, remains underrepresented in terms of actual actions and contributions, especially at the project level. Specifically, efforts to tackle marine pollution have been fragmented, with a focus on a few key areas like noise pollution, plastics, and organic pollutants. The Ocean Decade emphasises collaboration, urging governments, the private sector, and local communities to work together, but it has struggled to fully mobilise resources and commitments to tackle marine plastic pollution in a coordinated way. SIDS, in particular, face a major gap in representation and participation in actions related to plastic pollution under the Decade.

The UN Ocean Conferences, in addition, have been critical in highlighting the importance of ocean conservation and the need to address marine pollution, including plastics. UNOCs have resulted in new voluntary commitments, strategic frameworks, and dialogue around managing marine plastic pollution, but they are non-binding in nature. This means that, while they are essential for raising awareness, they do not guarantee

concrete or sustained action, and their effectiveness depends on the voluntary will of governments and stakeholders to implement measures.

As with the Ocean Decade, the Ocean Conferences have faced criticism for lacking binding commitments and for the fragmented approach to addressing marine plastic pollution. Nonetheless, they remain important for fostering international collaboration and the sharing of best practices.

Finally, the IMDCs, starting in the 1980s, have been key forums for discussing marine debris, including plastics, and exploring solutions. They have evolved from basic discussions on the quantity and impacts of marine debris to a more solution-oriented focus.

Recent IMDCs, including the 6th IMDC in 2018 and the 7th IMDC in 2022, brought together a global community to share knowledge and innovate around plastic waste solutions. These conferences highlight the need for cross-sector collaboration, involving governments, the private sector, NGOs, and communities. However, much like other voluntary frameworks, they lack enforceable mechanisms, leaving the actual implementation of solutions vulnerable to the political and economic priorities of the participating stakeholders.

Effective ocean governance, thus, remains a critical challenge – especially when it comes to combating marine plastic pollution. The chapter highlights the fragmentation of governance frameworks, including overlaps between global, regional, and national regulations, which complicate enforcement and compliance. It also points out the weak implementation of existing laws, particularly in regions with limited monitoring capacity.

Despite progress, significant gaps in governance and enforcement remain. The chapter concludes by stressing the need for a comprehensive global approach to MPP, one that addresses the sources of pollution, enhances international cooperation, and integrates local, national, and regional efforts.

In this regard, Chapter II goes beyond these gaps and explores the practical consequences of the absence of a comprehensive global approach MPP. The chapter focuses on Circular Economy strategies adopted by various countries and regions, revealing how these strategies influence the global trade of plastic waste and highlighting the major concerns this trade raises. The discussion then shifts toward potential legal approaches aimed at ensuring accountability from both authorities and the plastic industry, offering insights into how the law can address the ongoing challenges of plastic pollution.

2.2 Going beyond the gaps: how plastics have been approached so far

Building on the global frameworks outlined previously, this chapter shifts focus to explore mechanisms that complement and support international efforts in tackling marine pollution, with a particular emphasis on plastics.

While international treaties and voluntary commitments provide essential overarching frameworks, the challenges of marine pollution require more localised and context-specific solutions. Regional and national strategies play a pivotal role in addressing the unique threats posed by marine pollutants in different geographic areas and sectors, particularly when considering the varying levels of capacity, legal frameworks, and environmental priorities.

This chapter begins by analysing the ways in which regional approaches have sought to address marine pollution – particularly concentrating in the European Union and its relations with third countries. These regional initiatives often tailor responses to the specific marine ecosystems they aim to protect, offering more immediate and regionally coordinated actions.

Approaches focused on Circular Economy (CE) are critical to reducing the flow of plastic waste into the marine environment. These strategies prioritise reducing waste through design and material reuse, promoting recycling, and minimising the consumption of single-use plastics. Many national and regional policies are increasingly integrating CE principles to address plastic pollution at its source, ensuring that waste is treated as a resource rather than a pollutant. The implementation of CE frameworks at regional and national levels not only complements global efforts but also accelerates the transition toward more sustainable production and consumption patterns.

Despite the significant potential of regional and national frameworks to fill some of the gaps left by international agreements, their success is contingent upon a range of factors, including political will, economic resources, and the degree of collaboration between stakeholders.

The discussion unfolds in several parts, addressing the costs and consequences of plastic pollution, the role of the CE, the global trade in plastic waste, the governance challenges posed by MPP, and the emerging field of plastic litigation. The chapter also delves into the responsibility of states and corporations, exploring how legal frameworks are evolving to confront the mounting environmental harm caused by plastics.

2.2.1 From Global to Local: National and Regional Responses to the Complexity of (Marine) Plastic Pollution

The world's ocean sustains over 3 billion people who rely on marine and coastal biodiversity for their livelihoods⁷¹⁵. Unfortunately, over time, marine spaces have been taken for granted and have increasingly been treated as a universal dumping ground⁷¹⁶.

In 2008, more than 40% of the ocean was significantly impacted by multiple factors – pollution, depleted fisheries, loss of coastal habitats, and other human activities –, and by 2014⁷¹⁷, 66% of the ocean was already facing increasing cumulative impacts⁷¹⁸. Land-based actions⁷¹⁹, including the dumping of waste into water bodies, urbanisation, industrial and agricultural waste, and over-exploitation of resources, contribute to the accumulation of marine litter⁷²⁰.

Additionally, rivers around the planet are being overexploited to meet growing energy demands and the need for clean energy, negatively affecting their ecosystems and biodiversity. The construction of dams and barrages has further disrupted the natural flow of rivers, creating significant challenges for aquatic species, particularly fish. Moreover, the use of water systems for energy production has compounded these environmental pressures⁷²¹.

⁷¹⁵ CBD (2018). People depend on marine and coastal biodiversity for their livelihoods. Available at: <https://www.cbd.int/article/food-2018-11-21-09-29-49#:~:text=Over%20three%20billion%20people%20depend,most%2Dtraded%20food%20commodities%20worldwide>. Accessed on 19 February 2024.

⁷¹⁶ For centuries, the seas have served as a dumping ground for waste generated by human activities. In: Calmet, D.P. (1989). Ocean disposal of radioactive waste: Status report. IAEA Bulletin, n. 4, p. 47. International Atomic Energy Agency Publications. Available at: <https://www.iaea.org/sites/default/files/31404684750.pdf>. Accessed on 12 June 2023.

⁷¹⁷ In 2014, only 3% of the ocean was considered free from human pressure.

⁷¹⁸ IPBES (2019). **Global assessment report of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services**. Brondízio, E. S., Settele, J., Díaz, S., Ngo, H. T. (eds). IPBES Secretariat, Bonn, Germany, ISBN: 978-3-947851-20-1, p. XXVIII. Available at: [https://www.ipbes.net/system/files/2021-06/2020%20IPBES%20GLOBAL%20REPORT\(FIRST%20PART\)_V3_SINGLE.pdf](https://www.ipbes.net/system/files/2021-06/2020%20IPBES%20GLOBAL%20REPORT(FIRST%20PART)_V3_SINGLE.pdf). Accessed on 07 March 2023.

⁷¹⁹ In fact, most marine plastic litter comes from land-based sources. In: Răpă, M.; *et al.* (2024). An Overview of the Current Trends in Marine Plastic Litter Management for a Sustainable Development. **Recycling**, vol. 9, n. 2, p. 1. DOI: <https://doi.org/10.3390/recycling9020030>. Available at: <https://www.mdpi.com/2313-4321/9/2/30>. Accessed on 12 November 2024.

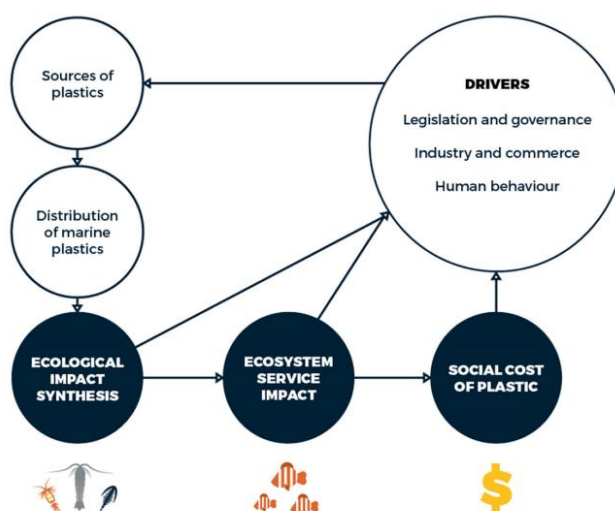
⁷²⁰ Guzzetti, E.; *et al.* (2018). Microplastic in marine organism: Environmental and toxicological effects. **Environmental Toxicology and Pharmacology**, vol. 64, p. 164. DOI: <https://doi.org/10.1016/j.etap.2018.10.009>. Available at: <https://www.sciencedirect.com/science/article/pii/S1382668918303934>. Accessed on 22 April 2022.

⁷²¹ Raha, U.K.; *et al.* (2021). Policy Framework for Mitigating Land-based Marine Plastic Pollution in the Gangetic Delta Region of Bay of Bengal- A review. **Journal of Cleaner Production**, vol. 278, p. 2. DOI: <https://doi.org/10.1016/j.jclepro.2020.123409>. Available at: https://www.sciencedirect.com/science/article/pii/S0959652620334545?ref=pdf_download&fr=RR-2&rr=90c34d8e0894ea3c. Accessed on 19 September 2024.

Marine litter, primarily composed of plastics, has caused extensive damage in different regions worldwide. Each year, an estimated 10 to 20 million tonnes of plastic enter the world's ocean, resulting in a global cost around USD 13 billion annually in environmental damage to marine ecosystems. This includes financial losses from fisheries and tourism, as well as the costs of beach clean-up efforts⁷²².

Considering that marine ecosystems offer a wide range of ecosystem services – such as providing food for billions of people, storing carbon, detoxifying waste, and offering cultural benefits like recreational opportunities and spiritual enrichment – it is known that any threat to these services could greatly affect human well-being globally, leading to a loss of food security, livelihoods, income, and health. In fact, a 1% to 5% decline in the delivery of marine ecosystem services could result in an annual loss of USD 500 to USD 2.500 billion in the value of benefits derived from these services. Besides, the impact of MPP on natural capital and resources is estimated to range between USD 3.300 and USD 33.000 per ton of plastic waste in the ocean⁷²³.

Figure 24 – Three-step approach to assess the societal impacts of MPP⁷²⁴



Source: Beaumont, N.J.; *et. al.* (2019). Global ecological, social and economic impacts of marine plastic. **Marine Pollution Bulletin**, vol. 142.

As Figure 24 demonstrates, plastic debris in the ocean causes consequences that are not only environmental, but also social and economic. The impacts of the global plastic supply chain are far-reaching, affecting individuals, communities, and vulnerable populations worldwide. As the complexities of global market systems exacerbate issues

⁷²² UNEP (2014c). *Ob. cit.*, p. 7.

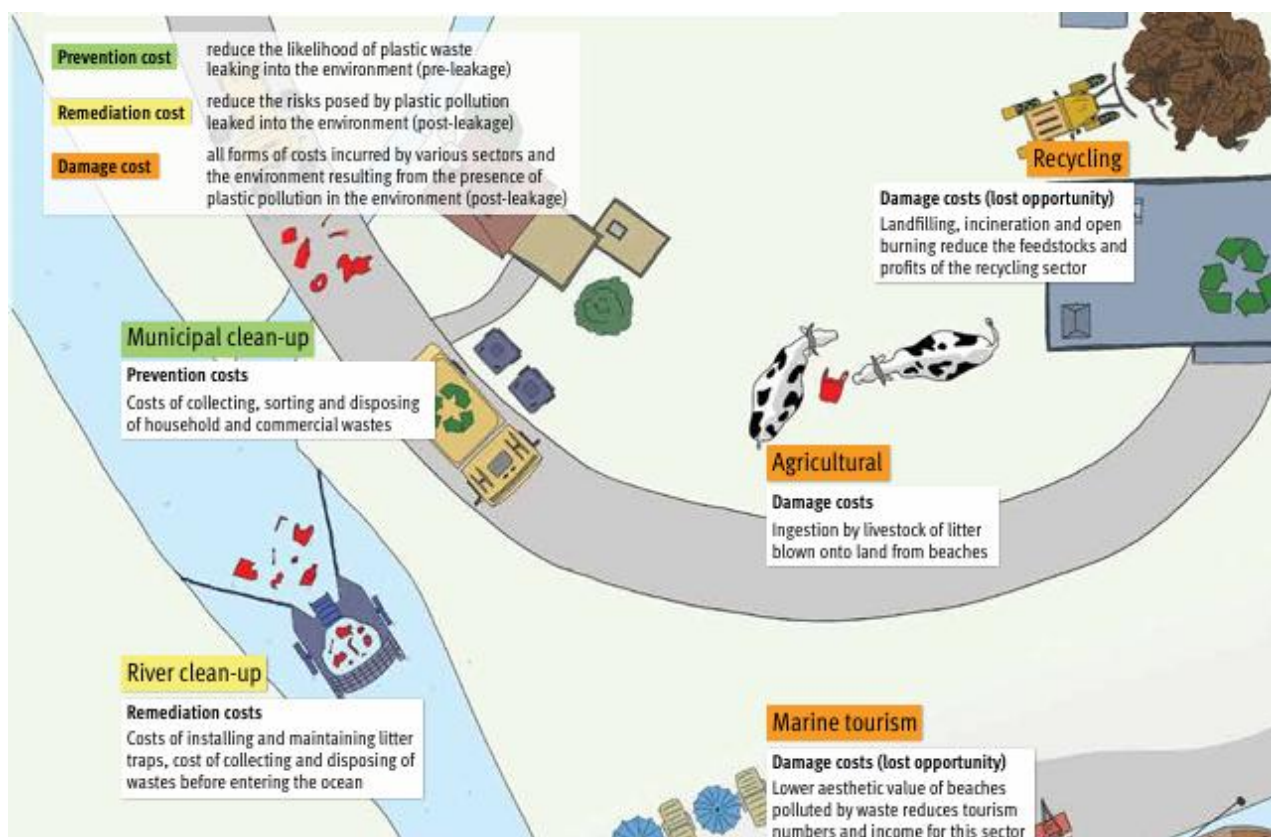
⁷²³ Based on 2011 data. In: Beaumont, N.J.; *et. al.* (2019). *Ob. cit.*, p. 189-193.

⁷²⁴ *Ibid*, p. 190.

of access and representation, the conversation around environmental justice has shifted from assigning blame to actors, to examining the broader social dynamics involved in the production and distribution of environmental harm⁷²⁵.

Consequently, despite what is led to believe about plastics in the common sense, plastics are not inexpensive. The production, disposal, and the pollution this material generates come with significant social, environmental, and economic costs, which are mostly shouldered by communities and governments⁷²⁶. In this regard, Figure 25 below illustrates the many costs associated with plastic pollution:

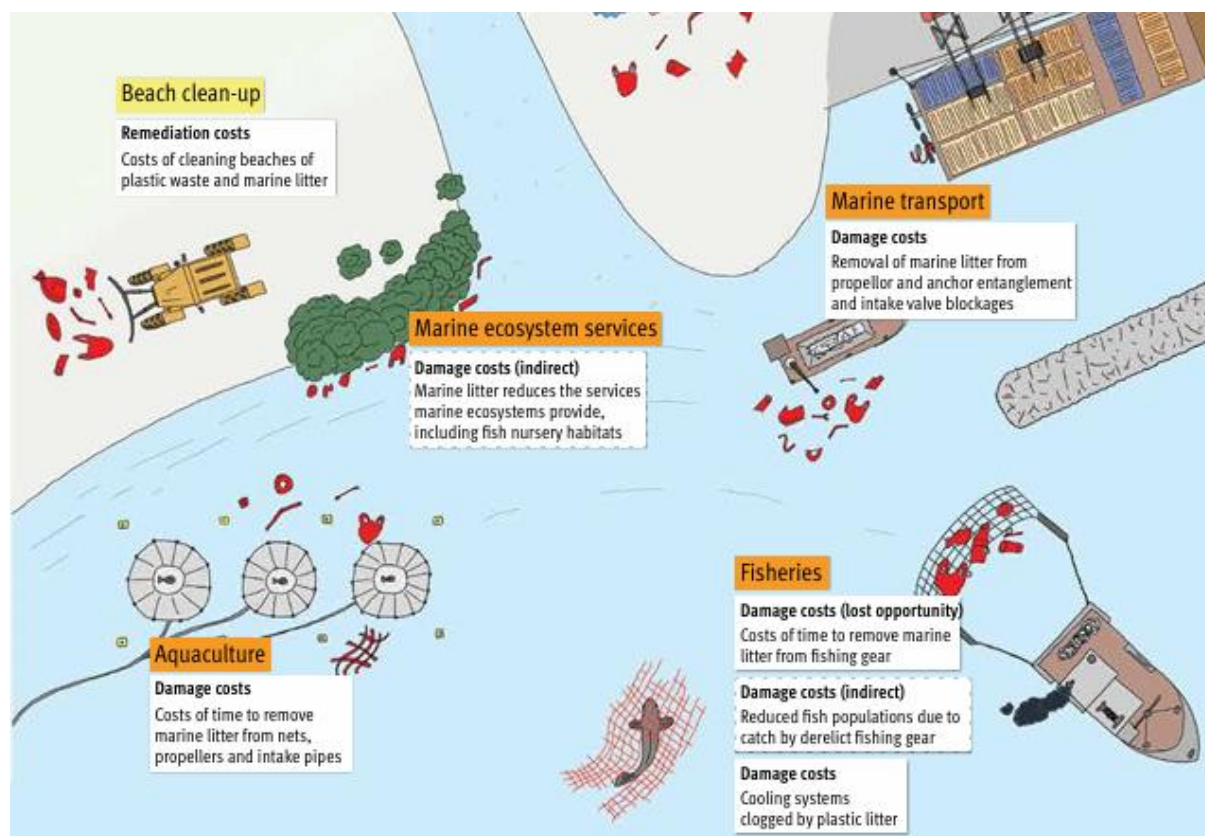
Figure 25 – The different economic costs of plastic pollution⁷²⁷



⁷²⁵ UNEP (2021d). *Ob. cit.*, p. 13.

⁷²⁶ WWF (2023). Who Pays for Plastic Pollution? Enabling global equity in the plastic value chain – towards a treaty to end plastic pollution. The report has been commissioned by WWF and produced by Dalberg Research & Consulting, with additional insight from WWF's plastics team, p. 4. Available at: <https://wwfint.awsassets.panda.org/downloads/wwf-report---who-pays-for-plastic-pollution.pdf>. Accessed on 12 January 2024.

⁷²⁷ UNEP (2021a). *Ob. cit.*, p. 37.



Source: UNEP (2021a). **Drowning in Plastics** – Marine Litter and Plastic Waste Vital Graphics.

Particularly in the Asia-Pacific Region (APR), these impacts cause an estimated USD 10.8 billion in damage annually to industries within the marine economy – actually translating to USD 18.3 billion globally (USD 21.3 billion in 2020)⁷²⁸. This estimate has increased eightfold since 2009, driven by better data, growth in the marine economy, and a rise in the amount of plastic waste in the ocean over the years⁷²⁹.

⁷²⁸ McIlgorm, A.; *et. al.* (2022). The cost of marine litter damage to the global marine economy: Insights from the Asia-Pacific into prevention and the cost of inaction. **Marine Pollution Bulletin**, vol. 174, p. 2. DOI: <https://doi.org/10.1016/j.marpolbul.2021.113167>. Available at: <https://www.sciencedirect.com/science/article/pii/S0025326X21012017>. Accessed on 05 June 2022.

⁷²⁹ In 2008, marine debris was estimated to have directly cost the 21 member economies of the Asia-Pacific Economic Cooperation (APEC) around USD 1.265 billion. In 2015, this estimate rose by eight times, reaching the USD10 billion mark. At current rates of marine debris disposal, the projected damage to these industries by 2050 is valued at USD 216 billion. This estimate does not account for the anticipated tripling of global plastic production by 2050. In: McIlgorm, A.; *et. al.* (2020). Update of 2009 APEC report on Economic Costs of Marine Debris to APEC Economies. A report to the APEC Ocean and Fisheries Working Group by the Australian National Centre for Ocean Resources and Security (ANCORS), University of Wollongong, Australia. APEC Oceans and Fisheries Working Group, p. 8. Available at: https://www.apec.org/docs/default-source/Publications/2020/3/Update-of-2009-APEC-Report-on-Economic-Costs-of-Marine-Debris-to-APEC-Economies/220_OFWG_Update-of-2009-APEC-Report-on-Economic-Costs-of-Marine-Debris-to-APEC-Economies.pdf. Accessed on 21 April 2023.

In Korea, marine litter was linked to 9% of all shipping accidents between 1996 and 1998⁷³⁰. From 2011 to 2020, the country experienced an average of 286 marine incidents per year involving entangled floating debris, most of which were caused by large plastic marine litter⁷³¹. Additionally, it was estimated that derelict fishing gear entanglements caused an annual economic loss of USD 97.6 million to Korean naval vessels⁷³².

In other areas, the estimated damages are equally significant. Marine litter constitutes a major nonpoint pollution challenge for Scotland, with an estimated annual cost⁷³³ of at least £16.8 million (or USD 24.3 million), accounting for consumptive, non-consumptive, and indirect uses of its coasts and waters⁷³⁴. When it comes specifically to marine-based plastic litter, which has been discovered on farmland near shorelines in Scotland, these debris contaminate the soil and cost farmers an average of € 500 per year in cleanup efforts⁷³⁵.

The Mediterranean region, which includes 22 countries and territories, accounts for 10% of global plastic production, making it the fourth-largest plastic producer in the world. The Mediterranean's flourishing Blue Economy represents 6% of the region's Gross Domestic Product (GDP) but loses an estimated € 641 million to marine plastic pollution each year. Tourism⁷³⁶, maritime trade, and fisheries are directly and adversely impacted by plastic pollution⁷³⁷.

Regarding the Latin America and the Caribbean (LAC), this region is becoming a new destination for plastic waste from global powers, particularly the USA: there has been a notable increase in the shipments of plastic waste to countries like Mexico,

⁷³⁰ McIlgorm, A.; *et. al.* (2022). *Ob. cit.*, p. 2.

⁷³¹ Kim, B.; *et. al.* (2023). Possibility analysis of complex marine accidents caused by large marine plastic litter in the Republic of Korea. **Marine Policy**, vol. 152, p. 1. DOI: <https://doi.org/10.1016/j.marpol.2023.105591>. Available at: <https://www.sciencedirect.com/science/article/pii/S0308597X23001185>. Accessed on 20 August 2025.

⁷³² McIlgorm, A.; *et. al.* (2022). *Ob. cit.*, p. 2.

⁷³³ For example, revenue losses in the fisheries, aquaculture, and marine tourism sectors.

⁷³⁴ Potts, T.; Hastings, E. (2011). *Marine Litter Issues, Impacts and Actions*. Published by the Scottish Government. ISBN: 978-1-78256-082-1, p. 25. Available at: <https://www.gov.scot/binaries/content/documents/govscot/publications/impact-assessment/2012/09/marine-litter-issues-impacts-actions/documents/00402421-pdf/00402421-pdf/govscot%3Adocument/00402421.pdf>. Accessed on 19 February 2024.

⁷³⁵ UNEP (2021d). *Ob. cit.*, p. 43.

⁷³⁶ Tourism accounts for over three-quarters of the current Mediterranean Sea economy, with maritime trade and fisheries producing the remainder.

⁷³⁷ Dalberg Advisors; WWF Mediterranean Marine Initiative (2019). *Stop the Flood of Plastic: How Mediterranean countries can save their sea*. Published by WWF - World Wide Fund for Nature (formerly World Wildlife Fund), p. 12. Available at: https://awsassets.panda.org/downloads/a4_plastics_reg_low.pdf. Accessed on 03 March 2022.

Ecuador, and several Central American nations in recent years⁷³⁸. This waste will most likely become plastic pollution, which negatively impacts local economies by decreasing the number of tourists and resulting in lost tourism revenue due to marine litter⁷³⁹.

Plastic pollution, evidently, results in severe environmental consequences for low- and middle-income countries (LMICs), posing growing threats to human health. The amount of plastic in the ocean is now so vast that nearly every marine species group has encountered MPP, with negative effects observed in almost 90% of those assessed⁷⁴⁰.

There is increasing awareness of the harmful human consequences faced by these countries. The environmental burden of plastic pollution has disproportionate socioeconomic impacts, including livelihood losses due to environmental degradation, toxic pollution from open burning, unsafe working conditions for waste disposal workers, and broader health risks for communities from flooding and disease. It is estimated that plastic pollution contributes to the loss of up to 1 million lives annually in LMICs⁷⁴¹.

The growing issues related to the production, use, and disposal of plastics, therefore, require urgent attention – as understanding the risks posed by these pollutants to both human health and ecosystems becomes increasingly critical⁷⁴².

Marine litter, however, cannot be attributed to a single source; instead, it results from various inputs and actions (or failures to act). Policies and laws must focus not only on litter removal but, more crucially, on regulating the production, use, and disposal of products⁷⁴³.

⁷³⁸ Global Alliance for Incinerator Alternatives (2021). Plastic waste has arrived in Latin America: trends and challenges in the region. Analysis of the situation in Argentina; Mexican scenario in preparation for the implementation of the Basel Convention Plastics Amendment; Current status on the import and export of plastic waste in Chile; Heading 3915: import of waste in Ecuador. Editors: Sirine Rached, Andrés del Castillo, Magdalena Donoso Design: Paulina Veloso. Available at: <https://www.no-burn.org/wp-content/uploads/2021/11/Executive-Summary-Plastic-waste-LA-ingles-1.pdf>. Accessed on 07 February 2022.

⁷³⁹ Husaini, D.C.; *et. al.* (2024). Plastic Waste in Latin America and the Caribbean (LAC): Impact on the Environment and Public Health—A Systematic Review. **Journal of Toxicology**, vol. 2024, p. 6. DOI: <https://doi.org/10.1155/2024/5698516>. Available at: <https://onlinelibrary.wiley.com/doi/epdf/10.1155/2024/5698516>. Accessed on 03 May 2024.

⁷⁴⁰ Tekman, M.B.; *et. al.* (2022). Impacts of plastic pollution in the oceans on marine species, biodiversity and ecosystems. WWF Germany, Berlin. ISBN 978-3-946211-46-4. DOI: 10.5281/zenodo.5898684. Available at: https://wwfint.awsassets.panda.org/downloads/wwf_impacts_of_plastic_pollution_on_biodiversity.pdf. Accessed on 14 July 2023.

⁷⁴¹ Williams, M.; *et. al.* (2019). No time to waste – Tackling the plastic pollution crisis before it's too late. A report by Tearfund, Fauna & Flora International (FFI), WasteAid and The Institute of Development Studies (IDS). Available at: https://wasteaid.org/wp-content/uploads/2019/05/NO_TIM2.pdf. Accessed on 13 January 2022.

⁷⁴² Raha, U.K.; *et. al.* (2021). *Ob. cit.*, p. 2.

⁷⁴³ UNEP (2016h). Marine Litter Legislation: A Toolkit for Policymakers. Report developed by the Environmental Law Institute (ELI) for the United Nations Environment Programme (UNEP), Nairobi, Kenya, p. 3. ISBN: 978-92-807-3594-9. Available at: <https://www.unep.org/resources/report/marine-litter-legislation-toolkit-policymakers>. Accessed on 18 August 2022.

Regulation is just one approach to addressing macroplastic and microplastic marine debris. Economic, market-driven, and community-based initiatives also play a crucial role in managing, preventing, and mitigating plastic pollution. Much like the response to climate change, these governance strategies are developed and implemented at local, national, regional, and global levels, each with varying levels of success and scale. Crucially, the responsibility for regulating, halting, or altering land-based sources of microplastic pollution falls to national governments, with each jurisdiction employing its own methods to tackle the issue⁷⁴⁴.

In view of this, the present Section focuses primarily on the national laws, regional strategies and institutional frameworks that address MPP from a socio-economic perspective: the focus is on the role of trade and the adoption of a circular economy. While there is still no global LBI to address plastic pollution, many countries and regions have implemented various measures to combat it – the results to date, however, have proven insufficient in effectively addressing the issue.

Subsection A “2.2.1.1” critically analyses CE as it relates to plastic waste management. The CE has been promoted by large companies as a sustainable way to tackle plastic pollution by focusing on recycling and reusing materials. The reality, however, is far from the idealised vision of a closed-loop system. In practice, plastic recycling rates remain very low, and many plastics are not recycled into high-quality new products but are instead downcycled into lower-value products. The promotion of CE principles by these corporations has been seen as a marketing strategy, diverting attention from the more fundamental issue of excessive plastic production. The subsection stresses that, while the idea of a CE sounds promising, its current implementation often serves the interests of the plastic industry, not the environment, and fails to provide a meaningful solution to plastic waste and pollution.

Subsection B “2.2.1.2”, subsequently, discusses the global trade of plastic waste, which has shifted dramatically since China’s 2018 ban on plastic waste imports. In response, many wealthy nations in the Global North began sending their plastic waste to developing countries in the Global South. The subsection highlights the ethical and environmental issues surrounding this trade, as it disproportionately burdens less developed nations with the responsibility of dealing with plastic waste that originates from wealthier countries. It critiques the global waste trade system as unjust and harmful to vulnerable populations.

⁷⁴⁴ Stoett, P.; Vince, J. (2019). *Ob. cit.*, p. 351.

2.2.1.1 Theoretical and legal divergences for a Circular Plastics Economy: a Concept in Collapse?

Although mass plastic production only began about 60 years ago, over 8 billion metric tonnes of virgin plastics have been produced since, with the majority eventually becoming waste⁷⁴⁵. This trend is expected to continue. One of the main challenges with plastics and their waste is that many have a lifespan of less than a year⁷⁴⁶. Moreover, most commonly used plastics are not biodegradable, leading to nearly permanent contamination of the environment – some plastics take over 400 years to degrade, making plastics a long-term issue. The plastics produced and discarded today will affect not only present generations but future ones as well⁷⁴⁷.

Another intricate aspect of plastics (and, consequently, plastic waste) management is that, despite the goal (and need) to fight pollution, it is practically impossible to think of a life without plastics. Therefore, the concern over plastic pollution is undoubtedly valid, but finding a feasible solution that takes into account both the role of plastics in society and the economy, as well as the scientific and technological challenges involved, requires significant global collaboration⁷⁴⁸.

In this context, the CE – or the circular plastics economy⁷⁴⁹ – emerges as an industrial system designed to be restorative or regenerative by intention. It replaces the traditional “end-of-life” model with a focus on restoration, prioritises the use of

⁷⁴⁵ By 2015, approximately 6.3 billion metric tons (Mt) of plastic waste had been produced, with roughly 9% being recycled, 12% incinerated, and 79% ending up in landfills or the natural environment. In: Geyer, R.; *et al.* (2017). Production, use, and fate of all plastics ever made. **Science Advances**, vol 3, n. 7, p. 1. DOI: 10.1126/sciadv.1700782 Available at: <https://www.science.org/doi/10.1126/sciadv.1700782>. Accessed on 11 June 2023.

⁷⁴⁶ Payne, J.; Jones, M.D. (2021). The Chemical Recycling of Polyesters for a Circular Plastics Economy: Challenges and Emerging Opportunities. **ChemSusChem** (Chemistry-Sustainability-Energy-Materials), vol. 14, n. 19, p. 4042. DOI: doi.org/10.1002/cssc.2021004004041. Available at: <https://chemistry-europe.onlinelibrary.wiley.com/doi/epdf/10.1002/cssc.202100400>. Accessed on 21 July 2023.

⁷⁴⁷ Lesniewska, L.; Steenmans, K. (2023). *Ob. cit.*, p. 72.

⁷⁴⁸ Dayrit, F.M. (2022). Circular Plastics Economy: Redesigning Technology and Reimagining Society. **Transactions of the National Academy of Science and Technology**, vol. 44, p. 1. DOI: doi.org/10.57043/transnastphl.2022.2570. Available at: <https://transactions.nast.ph/?p=2570>. Accessed on 06 June 2024.

⁷⁴⁹ As the Intergovernmental Negotiating Committee (INC) has called since the beginning of the LBI negotiations, as it is detailed in Part II of the research. For instance, in the document “Potential options for elements towards an international legally binding instrument”, the INC proposed as one of the options for the objectives of the future treaty to “Reduce the production, use and discharge of plastics across their life cycle, including through the promotion of a circular plastics economy (...)”. In: UNEP (2023b). Potential options for elements towards an international legally binding instrument, based on a comprehensive approach that addresses the full life cycle of plastics as called for by United Nations Environment Assembly resolution 5/14. Preparation of an international legally binding instrument on plastic pollution, including in the marine environment, Paris, 29 May–2 June 2023 (UNEP/PP/INC.2/4). Available at: <https://wedocs.unep.org/xmlui/bitstream/handle/20.500.11822/42190/UNEP-PP-INC.2-4%20English.pdf>. Accessed on 13 May 2024.

renewable energy, eliminates harmful chemicals that hinder reuse, and strives to eliminate waste through the optimised design of materials, products, systems, and business models⁷⁵⁰.

The 73rd session of the UNGA highlighted the importance of the CE in achieving sustainable development and the SDGs by acknowledging that businesses will be pivotal “*in the transition towards sustainable development and a more resource-efficient economy, including concepts such as the circular economy, by adapting their business models and value chains*”⁷⁵¹. Therefore, “social entrepreneurship”⁷⁵² plays a crucial role in achieving the SDGs by offering efficient, innovative, sustainable, and financially viable solutions to social and environmental issues – also aiming to address urgent environmental challenges, with approaches such as the CE, which focuses on maximising the use of existing resources and generating new revenue streams⁷⁵³.

In fact, integrating the principles of the CE into consumption and production systems is a crucial transition needed for implementing the 2030 Agenda. The linear economy model is unsustainable on a planet with limited resources that will eventually be depleted⁷⁵⁴.

Unlike the traditional “take-make-dispose” linear economy, a CE emphasises that material flows within the economy should also be circular. According to the OECD, the current plastic lifecycle is only 8% circular, and this is expected to rise to just 14% by 2060 unless significant global policy changes are implemented⁷⁵⁵.

⁷⁵⁰ Ellen MacArthur Foundation (2013). Towards the circular economy: economic and business rationale for an accelerated transition. Vol. 1, p. 7. Available at: <https://www.ellenmacarthurfoundation.org/towards-the-circular-economy-vol-1-an-economic-and-business-rationale-for-an>. Accessed on 03 January 2022.

⁷⁵¹ UNGA (2018b). Sustainable Development – Report of the Second Committee. Seventy-third session, Agenda item 20 (A/73/538). Available at: <https://docs.un.org/en/A/73/538>. Accessed on 04 January 2022.

⁷⁵² On 21 December 2016, the UNGA adopted Resolution 71/221 “Entrepreneurship for sustainable development”. Through this resolution, the Assembly acknowledges the significant role that entrepreneurship plays in sustainable development by creating jobs, fostering economic growth and innovation, improving social conditions, and tackling social and environmental challenges within the framework of the 2030 Agenda. The resolution emphasises the importance of a comprehensive, long-term, and holistic approaches to entrepreneurship, in order to achieve the many positive results that “social entrepreneurship” might enable, such as the realisation of important environmental goals, such as the SDGs and the Paris Agreement targets. In: UNGA (2017b). 71/221. Entrepreneurship for sustainable development. Resolution adopted by the General Assembly on 21 December 2016 (A/RES/71/221). Available at: <https://docs.un.org/en/A/RES/71/221>. Accessed on 08 February 2022.

⁷⁵³ UNGA (2018b). *Ob. cit.*, p. 16.

⁷⁵⁴ UNGA (2018c). Summary record of the joint meeting of the Second Committee and the Economic and Social Council on “The Circular Economy for the Sustainable Development goals: From Concept to Practice”. General Assembly Second Committee 7th meeting Economic and Social Council 2019 session 3rd meeting (A/C.2/73/SR.7–E/2019/SR.3). Available at: <https://documents.un.org/doc/undoc/gen/n18/315/04/pdf/n1831504.pdf>. Accessed on 06 March 2022.

⁷⁵⁵ OECD (2022a). **Global Plastics Outlook: Policy Scenarios to 2060**. OECD Publishing, Paris, p. 22. DOI: <https://doi.org/10.1787/aa1edf33-en>. Available at: https://www.oecd.org/en/publications/global-plastics-outlook_aa1edf33-en/full-report.html. Accessed on 02 June 2022.

And it is precisely due to this scenario that the CE proves to be essential, because combating plastic pollution does not mean ending plastic itself, but above all changing the relationship between society and plastic, that is, changing the mindset from a waste-oriented industry to one interested in circularity⁷⁵⁶.

Most plastics still come from non-renewable fossil fuels and their production and disposal contribute to a number of ecological problems, including pollution, climate change and the destruction of natural habitats. Rather than trying to manage waste only after it has been created, efficient design is the key to successful CE implementation. When designing plastic products, it is important to consider the use of less toxic and more renewable, biodegradable or compostable raw materials.

It is also fundamental to reduce the amount of materials used in plastic design to minimise waste and to use one or more polymers that can be easily separated during recycling⁷⁵⁷ – as in the present moment plastic recycling primarily relies on a mechanical methods that involve sorting plastics by polymer type, shredding, and melting. Mixed-polymer and contaminated plastics cannot be processed this way, resulting in a large portion of “recycled” plastics being sent to landfills or released into the environment⁷⁵⁸.

It should be noted, as well, that most plastic waste reuse, recycling, and recovery processes still result in substantial environmental damage, including air pollution and water contamination. The key challenge for those working to establish a circular plastics economy is to avoid relying on solution-based approaches that simply replicate existing business models in a circular context. To promote a truly circular plastics economy, regulatory measures are essential⁷⁵⁹.

⁷⁵⁶ Kedzierski, M.; *et al.* (2020). Why is there plastic packaging in the natural environment? Understanding the roots of our individual plastic waste management behaviours. **Science of The Total Environment**, vol. 740, 139985. DOI: <https://doi.org/10.1016/j.scitotenv.2020.139985>. Available at: <https://www.sciencedirect.com/science/article/pii/S0048969720335051>. Accessed on 01 May 2023.

⁷⁵⁷ Seyyedi, S. R.; *et al.* (2023). Marine plastics, circular economy, and artificial intelligence: A comprehensive review of challenges, solutions, and policies. **Journal of Environmental Management**, vol. 345, 118591. DOI: <https://doi.org/10.1016/j.jenvman.2023.118591>. Available at: <https://www.sciencedirect.com/science/article/abs/pii/S0301479723013798?via%3Dihub>. Accessed on 12 November 2023.

⁷⁵⁸ Furthermore, over time, a process of “downcycling” in materials recycled this way is observed, making them suitable only for lower-performance applications with each recycling cycle, thus continuing the need for the synthesis of new/virgin plastics. In: Williams, G.B.; *et al.* (2023). Harnessing extremophilic carboxylesterases for applications in polyester depolymerisation and plastic waste recycling. **Essays in Biochemistry**, vol. 67, n. 4, p. 716. DOI: <https://doi.org/10.1042/EBC20220255>. Available at: <https://portlandpress.com/essaysbiochem/article/67/4/715/233154/Harnessing-extremophilic-carboxylesterases-for>. Accessed on 12 June 2024.

⁷⁵⁹ Lesniewska, L.; Steenmans, K. (2023). *Ob. cit.*, p. 72.

The CE emphasises the need for perpetuity, circularity and a change of perspective, proposing a transition from the “extract-use-replace” economy to a regenerative and restorative “extract-use-recover-restore” economy⁷⁶⁰.

Circular plastic products, therefore, would be those designed to be safely reused several times and to have the material recycled or composted at the end of use – unlike what currently happens, as existing methods of plastic waste management (PWM) are clearly insufficient to address the environmental plastic pollution crisis⁷⁶¹.

In practice and on a large scale, with the “circular” types of products, it should be possible to minimise negative environmental impacts, and it may be possible to respect the rights, health and safety of all those involved in their life cycle – including waste collectors and other workers in that chain. This is to underscore that only an integrated and systemic shift from a linear economy to an eco-sustainable economy can keep plastics outside of ecosystems and of human bodies – leaving them only in the economy⁷⁶².

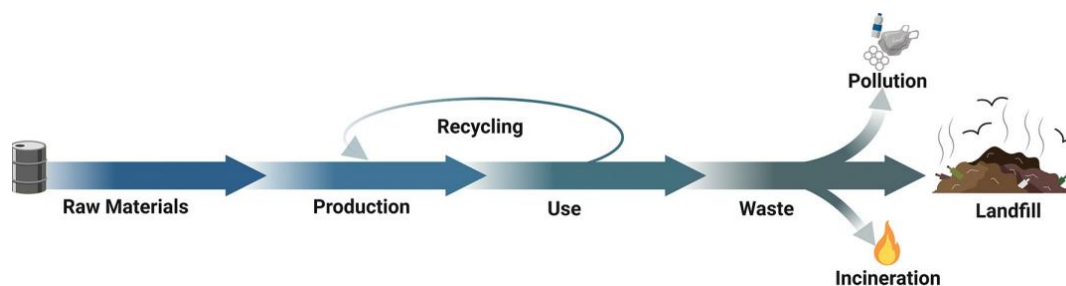
Presently, the linear model of plastic production involves: (i) extraction of inputs for the plastic sector (raw materials); (ii) production of virgin polymers; (iii) transportation and distribution of pellets; (iv) import of pellets; (v) transformation; (vi) consumer markets; (vii) distribution and marketing; (viii) final consumption; and (ix) collection, treatment and final disposal of plastic waste by the Governments or private agents⁷⁶³. See the representation of this linearity in Figure 26 below:

⁷⁶⁰ Fadeeva, Z.; Van Berkel, R. (2021). *Ob. cit.*, p. 1.

⁷⁶¹ Williams, G.B.; *et. al.* (2023). *Ob. cit.*, p. 716.

⁷⁶² UNEP (2023e). Turning off the Tap: How the world can end plastic pollution and create a circular economy. Nairobi, p. 7. ISBN: 978-92-807-4024-0. Available at: <https://www.unep.org/resources/turning-off-tap-end-plastic-pollution-create-circular-economy>. Accessed on 02 March 2024.

⁷⁶³ ABIPLAST (2021). Perfil 2021 - The plastic transformation and recycling industries in Brazil. *Associação Brasileira da Indústria do Plástico*, p. 18. Available at: https://www.abiplast.org.br/wp-content/uploads/2022/09/PERFIL_2021_EN_FINAL.pdf. Accessed on: 11 February 2024.

Figure 26 – Current linear model of plastic economy⁷⁶⁴

Source: Williams, G.B.; *et. al.* (2023). Harnessing extremophilic carboxylesterases for applications in polyester depolymerisation and plastic waste recycling. **Essays in Biochemistry**, vol. 67, n. 4, p. 717.

The process of developing a CE for plastics will not be fast, but rather slow and progressive, and its optimisation would require research and monitoring systems as well as an understanding of the sources, distribution and fate of plastic pollution in the environment⁷⁶⁵.

To tackle these challenges, a new model for plastic production and reuse is necessary, one that includes better waste collection, depolymerisation, resynthesis, and valorisation through chemical and biochemical recycling⁷⁶⁶ – although, ideally, waste and resources should be reused, recycled, or recovered only when prevention and minimisation are not feasible⁷⁶⁷. Establishing a closed-loop system for plastic materials, through the recycling and upcycling of polymers with minimal reliance on new synthesis from petroleum feedstocks, will enable the transition toward a circular plastic economy⁷⁶⁸.

There is also a high level of potential annual energy savings that could be achieved from recycling all global plastic waste, which is estimated to be equivalent to more than three billion barrels of oil per year. This demonstrates that PWM has also an effect on the carbon footprint, once recycling one million tonnes of plastics would be equivalent to taking one million cars off the roads⁷⁶⁹.

⁷⁶⁴ Williams, G.B.; *et. al.* (2023). *Ob. cit.*, p. 717.

⁷⁶⁵ Fadeeva, Z.; Van Berkel, R. (2021). *Ob. cit.*, p. 3.

⁷⁶⁶ Chemical recycling involves transforming polymeric waste by altering its chemical structure, converting it into substances that can be used as raw materials for producing plastics or other products. Various chemical recycling technologies are employed in this process, including pyrolysis, gasification, hydro-cracking, and depolymerisation. In: Plastics Europe (2023). Chemical recycling. Available at: <https://plasticseurope.org/sustainability/circularity/recycling/chemical-recycling/>. Accessed on 06 December 2023.

⁷⁶⁷ Lesniewska, L.; Steenmans, K. (2023). *Ob. cit.*, p. 2.

⁷⁶⁸ Williams, G.B.; *et. al.* (2023). *Ob. cit.*, p. 716.

⁷⁶⁹ European Commission (2018). Questions & Answers: A European strategy for plastics. Available at: https://ec.europa.eu/commission/presscorner/detail/en/MEMO_18_6. Accessed on 12 June 2023.

The CE is a resource-efficient economy where waste and pollution are eliminated, products and materials are kept in use at their maximum value (as long as possible) and natural systems are regenerated⁷⁷⁰.

It is well known that recycling in itself will not end plastic pollution⁷⁷¹, therefore a life-cycle approach is needed, which means reviewing the entire chain associated with plastics from their design, production and distribution to their end-of-life disposal by consumers. Strategies that target only one element of the economy (such as recycling) fail to address the problem in its complexity. Indeed, there is a need for systemic change⁷⁷² – CE should be recognised as a holistic strategy that incorporates economic development, environmental responsibility, and social equity⁷⁷³.

In this context, there exists, however, a critical tension that stems from the contrasting views of plastics as either a valuable resource or a harmful pollutant. While plastics have useful applications and some plastic waste can be reused, recycled, or recovered to a degree, the primary focus in achieving a CE should still be on preventing and minimising overall plastic use. Understanding these conflicting perspectives on plastics is crucial to grasp the complexities involved in governing plastics within CEs⁷⁷⁴.

Pollution is typically used to refer to a specific context or to describe a disruption to the environment caused by damage or interference⁷⁷⁵. From a legal standpoint, plastic waste can be seen as either – it can be a land-based source of pollution affecting the marine environment, which should be prevented, minimised, and controlled by States through laws and regulations in accordance with Article 213 of UNCLOS

States shall enforce their laws and regulations adopted in accordance with article 207 and shall adopt laws and regulations and take other measures necessary to implement applicable international rules and standards established through competent international organizations or diplomatic

⁷⁷⁰ Corona, B.; *et. al.* (2019). Towards sustainable development through the circular economy – A review and critical assessment on current circularity metrics. **Resources, Conservation and Recycling**, vol. 151, p. 1. DOI: <https://doi.org/10.1016/j.resconrec.2019.104498>. Available at: <https://www.sciencedirect.com/science/article/pii/S0921344919304045?via%3Dihub>. Accessed on 17 May 2022.

⁷⁷¹ Irwin, A. (2018). How to Solve a Problem Like Plastics. **New Scientist**, vol. 238, n. 3178, p. 31. DOI: [https://doi.org/10.1016/S0262-4079\(18\)30884-4](https://doi.org/10.1016/S0262-4079(18)30884-4). Available at: <https://www.sciencedirect.com/science/article/abs/pii/S0262407918308844?via%3Dihub>. Accessed on 13 April 2022.

⁷⁷² UNEP (2023e). *Ob. cit.*, p. 58.

⁷⁷³ Bourdin, S.; Jacquet, N. (2025). Closing the loop at the local scale: Investigating the drivers of and barriers to the implementation of the circular economy in cities and regions. **Ecological Economics**, vol. 231, p. 12. DOI: <https://doi.org/10.1016/j.ecolecon.2025.108542>. Available at: <https://www.sciencedirect.com/science/article/pii/S0921800925000254>. Accessed on 10 February 2025.

⁷⁷⁴ Lesniewska, L.; Steenmans, K. (2023). *Ob. cit.*, p. 73.

⁷⁷⁵ Springer, A.L. (1977). Towards a Meaningful Concept of Pollution in International Law. **The International and Comparative Law Quarterly**, vol. 26, n. 3, p. 532. Available at: <https://www.jstor.org/stable/758723?seq=2>. Accessed on 19 June 2023.

conference to prevent, reduce and control pollution of the marine environment from land-based sources⁷⁷⁶.

Additionally, existing waste management practices can lead to environmental changes, such as plastic leakage into natural habitats or the use of landfills for plastic (and other) waste⁷⁷⁷.

Other challenges involve preventing contamination during the collection and sorting of plastic waste, as well as addressing social concerns, such as the increased cancer risks faced by residents near plastic recycling facilities⁷⁷⁸. A fundamental issue with recycling – both mechanical and chemical – is that plastics are still very inexpensive to produce, while recycled plastic holds little value. As a result, it is often more cost-effective for businesses to produce new plastics rather than recycle existing ones⁷⁷⁹.

Besides, discarded plastic waste can also be viewed as a valuable resource. Landfills are increasingly recognised as reservoirs of man-made materials from the past, waiting to be recovered and reused⁷⁸⁰. There are also initiatives aimed at turning leaked plastic waste into a resource.

For example, the “Plastic Bank” rewards individuals who lack access to traditional banking with a cryptocurrency-based token for collecting ocean-bound plastic waste and bringing it to recycling centres. The initiative operates in countries such as Philippines, Indonesia, Brazil, Egypt, Thailand, and Cameroon⁷⁸¹. The collected plastics are then reprocessed into feedstock, which is reused by companies to manufacture products and packaging⁷⁸².

⁷⁷⁶ UN (1982). *Ob. cit.*, n.p.

⁷⁷⁷ James, G. (2019). The Plastics Landscape: The Challenges and Possible Solutions. Principles for Responsible Investment (PRI), report, p. 5. Available at: <https://www.unpri.org/download?ac=7014>. Accessed on 12 June 2023.

⁷⁷⁸ He, Z.; *et al.* (2015). Pollution characteristics and health risk assessment of volatile organic compounds emitted from different plastic solid waste recycling workshops. **Environment International**, vol. 77, p. 86. DOI: <https://doi.org/10.1016/j.envint.2015.01.004>. Available at: <https://www.sciencedirect.com/science/article/pii/S0160412015000082>. Accessed on 06 June 2023.

⁷⁷⁹ Parker, L. (2020). An old-school plan to fight plastic pollution gathers steam. National Geographic. Available at: <https://www.nationalgeographic.com/science/article/old-school-plan-to-fight-plastic-pollution-gathers-steam>. Accessed on 05 June 2023.

⁷⁸⁰ Burlakovs, J.; *et al.* (2017). Paradigms on landfill mining: From dump site scavenging to ecosystem services revitalization. **Resources, Conservation and Recycling**, vol. 123, p. 74. DOI: <https://doi.org/10.1016/j.resconrec.2016.07.007>. Available at: <https://www.sciencedirect.com/science/article/pii/S0921344916301707>. Accessed on 07 June 2023.

⁷⁸¹ Engao, E.L. (2024). Our story of becoming. Plastic Bank, Plastic Pollution and Recycling. Available at: <https://plasticbank.com/blog/our-story-of-becoming/>. Accessed on 17 November 2024.

⁷⁸² Lesniewska, L.; Steenmans, K. (2023). *Ob. cit.*, p. 74.

However, the recovery of plastic waste through methods like “waste-to-energy”⁷⁸³ processes or the extraction of landfilled and leaked plastics can present challenges, as these processes often lead to the commodification of plastic waste by assigning economic value to it – and this can, consequently, delay the development of more sustainable and circular infrastructures⁷⁸⁴.

When financial gains are linked to incinerating or recovering landfilled plastic, there may be little incentive to reduce both plastic consumption and waste generation. This does not mean all recovery efforts are financially driven – for instance, in Rotterdam, the Netherlands, plastic bottles removed from the Nieuwe Maas river are repurposed to build a floating island for community use, with no profit-driven model involved⁷⁸⁵.

To summarise, while solutions like reuse, recycling, recovery, and bioplastics⁷⁸⁶ are often discussed, the real priority should be on preventing waste by tackling the root

⁷⁸³ Waste-to-energy is a method for recovering waste, including plastics, by reducing their volume and weight through the destruction of contaminated materials while generating energy. Recent studies have explored the potential of converting plastic waste into hydrogen and carbon. Plastic-to-hydrogen processes offer benefits such as lower oxidant demand, product flexibility, and high hydrogen production efficiency. However, they also come with drawbacks, including increased tar production (the process in which organic compounds are transformed into gases through high-temperature combustion, producing minimal tar emissions), higher operational costs, greater CO₂ emissions, lower gasification efficiency, and the presence of impurities and pollutants, along with higher ash production compared to conventional combustion methods. Additional research is required on process optimisation, the development of cost-effective catalysts, and the investigation of the underlying mechanisms. In: Chen, Z.; *et. al.* (2024). Upcycling of plastic wastes for hydrogen production: Advances and perspectives. **Renewable and Sustainable Energy Reviews**, vol. 195, p. 16. DOI: <https://doi.org/10.1016/j.rser.2024.114333>. Available at: <https://www.sciencedirect.com/science/article/pii/S136403212400056X>. Accessed on 13 February 2025; Bashir, M.A.; *et. al.* (2025). Plastic waste gasification for low-carbon hydrogen production: a comprehensive review. **Energy Advances**, 34p. Themed collection Energy Advances Recent Review Articles. DOI: <https://doi.org/10.1039/D4YA00292J>. Available at: <https://pubs.rsc.org/en/content/articlelanding/2025/ya/d4ya00292j>. Accessed on 13 February 2025.

⁷⁸⁴ Lesniewska, L.; Steenmans, K. (2023). *Ob. cit.*, p. 75.

⁷⁸⁵ In 2018, architects unveiled a modular hexagonal floating park in Rotterdam. The Recycled Park’s floating foundations are made from plastic waste collected from the Nieuwe Maas River. The project aims to enhance the city’s green spaces while improving the ecological health of the river. The submerged sections of the modules act as support structures for aquatic plants, providing shelter for fish and molluscs. In: Kizilova, S. (2019). Form and functional features of modular floating structures. **Web of Conferences**, vol. 91, p. 3. DOI: <https://doi.org/10.1051/e3sconf/20199105013>. Available at: https://www.e3s-conferences.org/articles/e3sconf/abs/2019/17/e3sconf_tpacce2019_05013/e3sconf_tpacce2019_05013.html. Accessed on 12 January 2025.

⁷⁸⁶ About bioplastics, it is worth clarifying that bioplastics are not necessarily more environmentally friendly than other (conventional) plastics – bio-based and/or biodegradable materials currently available on the market can actually be just as toxic as conventional plastics in terms of the chemicals they contain. Many plastics at the start of their life cycle rely on fossil fuels as raw feedstocks. While there is an increasing number of innovations producing plastics from organic materials, there is currently a lack of sufficient research into their life cycle assessments and environmental impacts. Bioplastics (also known as biopolymers) are plastics that are both biobased and biodegradable. Mandating the use of bioplastics could help address the permanence issues caused by conventional plastics leaking into the environment. However, the time it takes for these polymers to biodegrade depends heavily on the environment in which they are decomposing (many bioplastics won’t biodegrade in landfills) and their specific physical and chemical properties. Analysis have shown that biopolymers not necessarily perform better in terms of environmental impacts and environmental metrics. Often bioplastics have resulted in the greatest levels of pollutants

causes – production processes and (over-) consumption. This challenge is particularly difficult due to the entrenched structures of the linear economic system⁷⁸⁷.

The current (linear) economic model and its underlying policies and incentives favour short-term gains and ignore externalities caused by economic activities, such as resource depletion, environmental degradation or human health implications. Shifting economic incentives to penalise pollution and reward resource efficiency will increase the economic attractiveness of CE solutions⁷⁸⁸. To transform this scenario, new approaches and long-term solutions are needed, such as the use of CE principles in the production and consumption of plastics⁷⁸⁹.

The three main principles of the CE of plastics – eliminate, innovate and circulate – offer a new vision of a sustainable future. This means striving to eliminate unnecessary plastic products; innovating so that all plastics that are actually needed are designed to be reused, recycled or composted safely; and circulating everything to keep them in the economy and out of the environment⁷⁹⁰.

Moving to a CE, as a matter of fact, can reduce the volume of plastics released into the ocean by more than 80% by 2040; reduce virgin plastic production by 55%; save governments USD 70 billion by 2040; reduce greenhouse gas (GHG) emissions by 25%; and create 700.000 new jobs, especially in the Global South⁷⁹¹.

Given that most plastics are non-biodegradable and can remain in the ocean for several years; that there are approximately 5 trillion pieces of plastic in the world's seas⁷⁹²; and considering the inability to collect plastic waste from the seas and coastlines – mainly because clean-up campaigns and associated initiatives cannot keep up with the

(likely due to fertilisers and pesticides used in their production), although they showed better performance in terms of lower GHG emissions. In: Tabone, M.; *et. al.* (2010). Sustainability Metrics: Life Cycle Assessment and Green Design in Polymers. **Environmental Science & Technology**, vol 44, n. 21. DOI: 10.1021/es101640n. Available at: <https://pubs.acs.org/doi/10.1021/es101640n#>. Accessed on 11 January 2025; Zimmermann, L.; *et. al.* (2020). Are bioplastics and plant-based materials safer than conventional plastics? In vitro toxicity and chemical composition. **Environment International**, vol. 145. DOI: <https://doi.org/10.1016/j.envint.2020.106066>. Available at: <https://www.sciencedirect.com/science/article/pii/S0160412020320213>. Accessed on 11 January 2025.

⁷⁸⁷ Lesniewska, L.; Steenmans, K. (2023). *Ob. cit.*, p. 75-76.

⁷⁸⁸ UNEP (2023f). Plastic Treaty progress puts spotlight on circular economy. Story, Nature Action. Available at: <https://www.unep.org/news-and-stories/story/plastic-treaty-progress-puts-spotlight-circular-economy>. Accessed on 13 November 2023.

⁷⁸⁹ Seyyedi, S. R.; *et. al.* (2023). *Ob. cit.*, p. 11.

⁷⁹⁰ Ellen MacArthur Foundation (2019). Plastics and the circular economy – deep dive. Available at: <https://www.ellenmacarthurfoundation.org/plastics-and-the-circular-economy-deep-dive>. Accessed on 19 June 2023.

⁷⁹¹ UNEP (2023e). *Ob. cit.*, p. 30.

⁷⁹² Priya, A.K.; *et. al.* (2023). *Ob. cit.*, p. 5.

increasing amount of plastic released into the environment – a significant number of efforts have put the CE on the agenda to combat MPPs at source⁷⁹³.

In this regard, when it comes to the promotion of CE strategies worldwide, it is interesting noting that CE is governed by the rules of international law as well as by national laws of various countries. Within the framework of international law, the CE has gained importance in recent years as an instrument presenting solution to some of the most pressing cross-cutting sustainable challenges of the present⁷⁹⁴.

The current situation of limited resources, increasing consumption and the global pollution crisis, drives more and more national and international legal entities to realise the need to shift to a CE model that supports sustainable economic development without harming the environment⁷⁹⁵. The definition of CE, however, is not universally agreed upon, there are actually several ways to define CE. It can generally be understood as a strategy for avoiding over-consumption, waste and the use of fossil fuels through the reuse, repair and recycling of existing materials and products⁷⁹⁶, but this understanding is variable depending on many factors.

There are at least 114 definitions for CE⁷⁹⁷ – of academic and practical relevance – originated from scholars' articles as well as from non-academic players' works and reports. Undoubtedly, CE is of significant interest to both scholars and practitioners, as it is seen as a practical approach for businesses to implement the widely discussed concept of sustainable development⁷⁹⁸.

Its possible contributions to LMICs in the Global South (excluding China), however, have largely been overlooked⁷⁹⁹, although the CE concept has been praised for its potential economic, environmental, and social benefits – as it is estimated that there

⁷⁹³ Fadeeva, Z.; Van Berkel, R. (2021). *Ob. cit.*, p. 4.

⁷⁹⁴ UNGA (2018c). *Ob. cit.*, p. 2.

⁷⁹⁵ Mikichurova, O.V.; Vlialko, I.V. (2021). Circular law as a legal basis for a circular economy. IOP Conf. Series: **Earth and Environmental Science**, vol. 915, p. 1. DOI:10.1088/1755-1315/915/1/012022. Available at: <https://iopscience.iop.org/article/10.1088/1755-1315/915/1/012022>. Accessed on 11 September 2023.

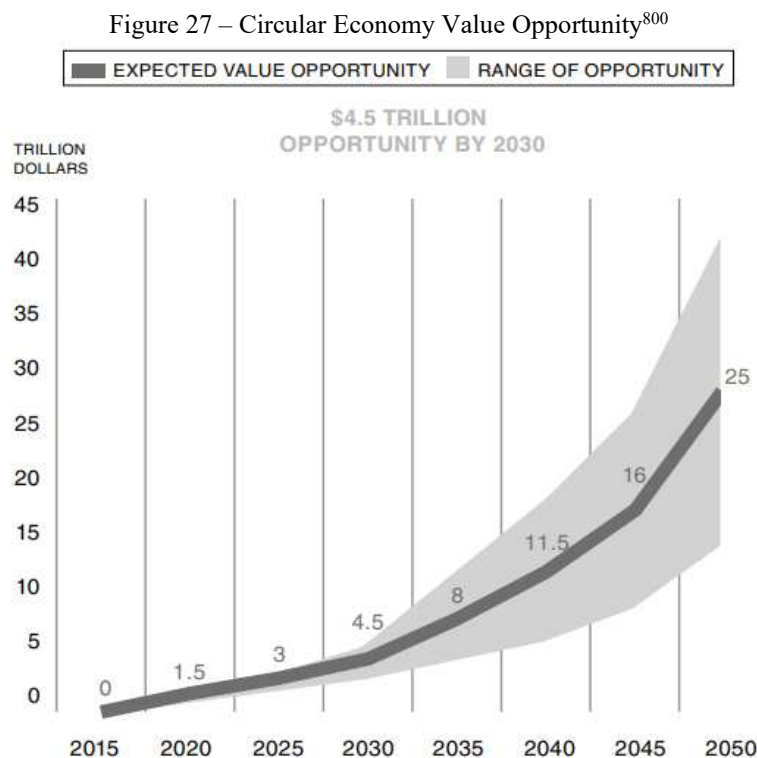
⁷⁹⁶ UNFCCC (2021a). Shifting to a Circular Economy Essential to Achieving Paris Agreement Goals. UN Climate Change News, 15 April. Available at: <https://unfccc.int/news/shifting-to-a-circular-economy-essential-to-achieving-paris-agreement-goals>. Accessed on 07 March 2022.

⁷⁹⁷ These might not be exhaustive but are quite representative of the written definitions of CE provided by scholars and practitioners.

⁷⁹⁸ Kirchherr, J.; *et. al.* (2017). Conceptualizing the circular economy: An analysis of 114 definitions. **Resources, Conservation and Recycling**, vol. 127, p. 222. DOI: <https://doi.org/10.1016/j.resconrec.2017.09.005>. Available at: <https://www.sciencedirect.com/science/article/pii/S0921344917302835>. Accessed on 19 September 2022.

⁷⁹⁹ Schröder, P.; *et. al.* (2019). Degrowth within – Aligning circular economy and strong sustainability narratives. **Resources, Conservation and Recycling**, vol. 146, p. 190-191. DOI: <https://doi.org/10.1016/j.resconrec.2019.03.038>. Available at: <https://www.sciencedirect.com/science/article/pii/S0921344919301429>. Accessed on 17 July 2023.

are significant value opportunities arising from business solutions that address and eliminate waste in the linear economy, as Figure 27 shows:



Source: Lacy, P.; Rutqvist, J. (2015). **Waste to Wealth: The Circular Economy Advantage**.

As the graphic highlights, financial benefits of CE business models could reach USD 4.5 trillion by 2030⁸⁰¹. Economic gains from transitioning to CE in Europe and China are expected to amount to EUR 1.8 trillion by 2030⁸⁰² and over USD 10 trillion by 2040⁸⁰³, respectively.

A global shift to CE is also anticipated to play a key role in mitigating resource-related climate impacts⁸⁰⁴, as material management is responsible for 67% of global GHG

⁸⁰⁰ Lacy, P.; Rutqvist, J. (2015). **Waste to Wealth: The Circular Economy Advantage**. London: Palgrave Macmillan (Accenture Strategy), 264 p. ISBN: 978-1-137-53068-4. DOI: 10.1057/9781137530707.

⁸⁰¹ *Ibid.*, p. 29-30.

⁸⁰² McKinsey Center for Business and Environment (2015). Europe's circular-economy opportunity. Available at: <https://www.mckinsey.com/~media/McKinsey/Business%20Functions/Sustainability/Our%20Insights/Europes%20circular%20economy%20opportunity/Europes%20circulareconomy%20opportunity.ashx>. Accessed on 19 June 2023.

⁸⁰³ Ellen MacArthur Foundation; Arup (2018). The Circular Economy Opportunity for Urban & Industrial Innovation in China. Report, p. 21. Available at: <https://www.arup.com/insights/the-circular-economy-opportunity-for-urban-and-industrial-innovation-in-china/>. Accessed on 19 June 2023.

⁸⁰⁴ Circle Economy (2020). The Circularity Gap Report 2020. Third Edition, p. 21. Available at: https://cdn.prod.website-files.com/5e185aa4d27bcf348400ed82/5e26ead616b6d1d157ff4293_20200120%20-%20CGR%20Global%20-%20Report%20web%20single%20page%20-%20210x297mm%20-%20compressed.pdf. Accessed on 12 June 2023.

emissions⁸⁰⁵. Social benefits, particularly job creation, are frequently stressed, with predictions suggesting that CE activities could generate around 700.000 additional jobs in Europe⁸⁰⁶. The actual employment outcomes from transitioning to a CE, nevertheless, remain uncertain and debated. To truly support the achievement of SDGs, the evidence and understanding of CE's potential value need to be expanded⁸⁰⁷.

Despite these potential benefits, the global development of CE has yet to fully mature, with what is referred to as the “circularity gap” growing⁸⁰⁸. This gap represents the disparity between the resources extracted and the amount of material lost due to waste generation and depletion⁸⁰⁹. Furthermore, only a handful of CE business models have seen success, with many of these being described as “limited and fragile”⁸¹⁰.

The current model of economic development is in direct conflict with the availability of resources – humanity is already consuming resources at a rate equivalent to 1.5 planets each year, which means that 50% more resources than Earth can regenerate (or absorb in terms of pollution) are being used annually⁸¹¹. At the current rate of development, projections show a need for resources from three planets annually by 2050:

⁸⁰⁵ Lesniewska, L.; Steenmans, K. (2023). *Ob. cit.*, p. 2.

⁸⁰⁶ Cambridge Econometrics; Trinomics; ICF (2018). Impacts of circular economy policies on the labour market. Final report, p. 39. Available at: https://circulareconomy.europa.eu/platform/sites/default/files/ec_2018_-_impacts_of_circular_economy_policies_on_the_labour_market.pdf. Accessed on 12 June 2023.

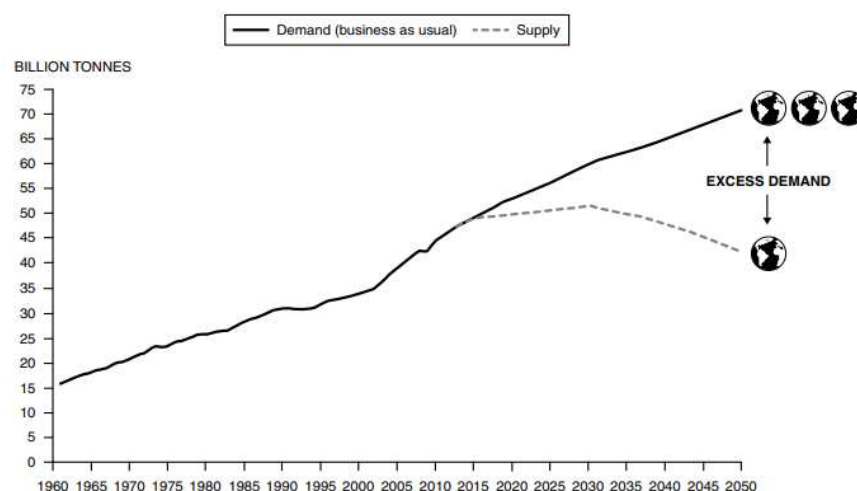
⁸⁰⁷ Lesniewska, L.; Steenmans, K. (2023). *Ob. cit.*, p. 2.

⁸⁰⁸ In 2020, the global economy was only 8.6% circular; just two years before, in 2018, it was 9.1%.

⁸⁰⁹ Circle Economy (2020). *Ob. cit.*, p. 8.

⁸¹⁰ Gregson, N.; *et. al.* (2015). Interrogating the circular economy: the moral economy of resource recovery in the EU. **Economy and Society**, vol. 44, n. 2, p. 220. DOI: <https://doi.org/10.1080/03085147.2015.1013353>. Available at: <https://www.tandfonline.com/doi/full/10.1080/03085147.2015.1013353?scroll=top&needAccess=true>. Accessed on 07 July 2023.

⁸¹¹ Lacy, P.; Rutqvist, J. (2015). *Ob. cit.*, p. 15.

Figure 28 – Global Supply and Demand for Constrained Material and Energy Resources, 1960-2050⁸¹²

Source: Lacy, P.; Rutqvist, J. (2015). **Waste to Wealth: The Circular Economy Advantage**. London: Palgrave Macmillan (Accenture Strategy).

This is unsustainable in the long term. Many CE business models of multinational companies, however, continue to prioritise growth.

For instance, both The Coca-Cola Company and Amazon have made commitments to a CE. Coca-Cola focuses on using recycled materials for packaging and recycling bottles and cans⁸¹³, while Amazon emphasises increasing recycling and offering reuse and repair initiatives⁸¹⁴. This raises the question of how truly “circular” these multinational companies could really be, as existing business models and the economic system continue to incentivise ongoing consumption, resulting in what can essentially be described as “same-but-circular business” models⁸¹⁵.

Such strategies are truly questionable, especially when considering that Coca-Cola, along with other four brands are the top five plastic polluters:

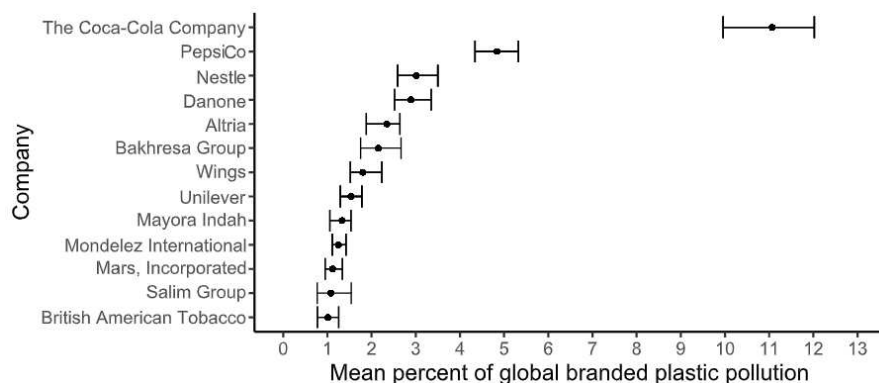
⁸¹² Lacy, P.; Rutqvist, J. (2015). *Ob. cit.*, p. 15.

⁸¹³ The company states that they offer “beverages in a variety of packaging formats – glass and plastic bottles, aluminum cans and refillable packaging. Each option can play a role in helping reduce packaging waste and emissions” and they are “focusing efforts to use more recycled material” in their primary packaging. In: The Coca-Cola Company (2021). Packaging solutions. Available at: <https://www.coca-colacompany.com/sustainability/packaging#:~:text=Design,to%2035%25%20globally%20by%202035>. Accessed on 12 January 2025.

⁸¹⁴ In this regard, Amazon states that they “aim to avoid waste altogether through innovation, design, and operational efficiencies” offering “programs to enable our customers to repair, resell, recycle, and repurpose their products”. In: Amazon (2021). Reducing waste & packaging. Available at: <https://sustainability.aboutamazon.com/waste#:~:text=for%20recycled%20output.-,Amazon%20Second%20Chance,responsibly%20dispose%20of%20Amazon%20packaging..> Accessed on 12 January 2025.

⁸¹⁵ Lesniewska, L.; Steenmans, K. (2023). *Ob. cit.*, p. 7.

Figure 29 – The global percent (x axis) of each company's branded plastic (y axis) found in the 1494 audit events⁸¹⁶



Source: Cowger, W.; *et. al.* (2024). Global producer responsibility for plastic pollution. **Science Advances**, vol. 10, p. 3.

As Figure 29 demonstrates, the Coca-Cola Company was found as the main plastic polluter (11%), followed by PepsiCo (5%), Nestlé (3%), Danone (3%) and Altria (2%). It was revealed that there is a clear and strong relationship between the annual plastic production of these companies and the plastic pollution they generate. Phasing out single-use and short-lived plastic products by the biggest polluters would therefore greatly reduce global plastic pollution – along with fundamental changes in the way plastic producers are regulated⁸¹⁷.

Government support and legislation, thus, are essential to facilitate a faster transition to a “real” CE⁸¹⁸. Thus, in this scenario, a very relevant case to analyse is the one of the European Union (EU) in contrast with third countries.

The EU has demonstrated a shift towards the CE at least since 2015, identifying plastics as a major management priority⁸¹⁹ – but the biggest concern on promoting the CE focused on plastics, however, is related to the international trade in plastics. Especially since questions about the impact that laws can have on distributional equity and justice,

⁸¹⁶ Brand names can be used to hold companies accountable for their (plastic) products polluting the environment. Using data from a global program (covering 84 countries) conducted over five years (2018–2022), which included 1.576 audit events (1494 after excluding unbranded items), a study identified brands on plastic items found in the environment. In: Cowger, W.; *et. al.* (2024). Global producer responsibility for plastic pollution. **Science Advances**, vol. 10, p. 3. Available at: <https://www.science.org/doi/epdf/10.1126/sciadv.adj8275>. Accessed on 29 April 2024.

⁸¹⁷ Cowger, W.; *et. al.* (2024). *Ob. cit.*, p. 3-4.

⁸¹⁸ Lesniewska, L.; Steenmans, K. (2023). *Ob. cit.*, p. 2.

⁸¹⁹ European Union (2015). Communication from the European Commission ‘Closing the loop – An EU action plan for the Circular Economy’. Available at: https://eur-lex.europa.eu/resource.html?uri=cellar:8a8ef5e8-99a0-11e5-b3b7-01aa75ed71a1.0012.02/DOC_1&format=PDF. Accessed on 18 May 2023.

as well as how a CE could avoid repeating the injustices of the linear economic system, are largely overlooked⁸²⁰.

When the EU first adopted the Circular Economy Action Plan (CEAP) in 2015, it established concrete and ambitious actions for achieving the aimed transition towards circularity, with measures covering the whole life cycle of products and materials until their very end: from production and consumption to waste management, therefore providing measures for the sound management of residues and litter⁸²¹.

In 2017, the EU expressed its interest in investing in a smart, innovative, and sustainable industry, by adopting renewed industrial practices in the continent, as well as a strategy to move towards a CE in the field of plastics, which culminated in the Plastics Strategy of 2018⁸²².

A new CEAP was launched in 2020 and, along with the European Green Deal of 2019, these are important instruments to provide a future-oriented framework for accomplishing a cleaner and more competitive EU together with civil and economic actors. The Green Deal – a growth plan for a carbon neutral Europe until 2050 – declares that, while the CEAP will guide the transition of all sectors, the Green Deal actions are centred on resource-intensive sectors such as textiles and plastics. The European Commission will supplement the 2018 Plastics Strategy focusing, among other things, on measures to tackle intentionally added micro plastics and unintentional releases of plastics⁸²³.

The European Commission adopted a new approach, as well, for a Sustainable Blue Economy, committing to act not only inside the EU, but also abroad, leading the efforts to reach the future Global Plastics Treaty and to promote the adoption of the Circular Economy Approach to Plastics⁸²⁴.

⁸²⁰ Lesniewska, L.; Steenmans, K. (2023). *Ob. cit.*, p. 2.

⁸²¹ European Commission (2015). First circular economy action plan. Available at: https://environment.ec.europa.eu/topics/circular-economy/first-circular-economy-action-plan_en. Accessed on 10 June 2023.

⁸²² European Union (2018). Communication from the European Commission ‘A European Strategy for Plastics in a Circular Economy’. Available at: https://eur-lex.europa.eu/resource.html?uri=cellar:2df5d1d2-fac7-11e7-b8f5-01aa75ed71a1.0001.02/DOC_1&format=PDF. Accessed on 18 May 2023.

⁸²³ The Green Deal was proposed in 2019 by the European Commission. For more, *see* European Union (2019a). Communication from the European Commission ‘The European Green Deal’. Available at: https://commission.europa.eu/publications/communication-european-green-deal_en. Accessed on 17 June 2023.

⁸²⁴ European Union (2021a). Communication from the European Commission ‘on a new approach for a sustainable blue economy in the EU Transforming the EU’s Blue Economy for a Sustainable Future’. Available at: <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52021DC0240>. Accessed on 20 June 2023.

Based on a large consensus that an environment that allows a dignified life and well-being should be guaranteed for the present and for the future generations⁸²⁵, it is possible to affirm that promoting this transition from a linear economy to a CE consists, as well, of a solidarity duty of the EU; more specifically, a commitment to intergenerational solidarity, in the light of EU's very own values⁸²⁶.

In this regard, the EU Action Plan “Towards Zero Pollution for Air, Water and Soil” is another significant instrument that provides targets for zero pollution by 2030. Under EU law and in collaboration with other strategies, the EU demonstrates its aim to reduce 30% of microplastics released into the environment and 50% of plastic litter in the ocean⁸²⁷.

This brief overview shows that the EU, undoubtedly, is very well equipped with policies and strategies aimed at achieving sustainable development, especially through the implementation of the CE. Despite all these mechanisms addressing circularity and the management of waste – including plastic residues –, 70% of discarded plastics in the EU are still put in landfills or incinerated⁸²⁸. Besides, it is relevant pointing out that most of these European policies concerned with plastics and CE were launched and adopted right after what is known as the “China ban”.

Before delving into that, it is worth recalling that, from a global perspective, the movement or reuse of waste could fit the concept of CE – as there are more than 114 definitions for it worldwide⁸²⁹. This means that the simple transfer of waste from one country to another would be a form of “circularity”. This practice, however, raises a series of ethical questions⁸³⁰ – especially considering that current CE approaches rarely incorporate sustainable raw material extraction and safe final sink disposal, which are two of its essential components⁸³¹.

⁸²⁵ Desing, H.; *et. al.* (2020). A circular economy within the planetary boundaries: Towards a resource-based, systemic approach. **Resources, Conservation and Recycling**, vol. 155, p. 2. Available at: <https://www.sciencedirect.com/science/article/pii/S0921344919305798>. Accessed on 10 August 2023.

⁸²⁶ The values of the European Union are highlight in Articles 2 and 3.5, of the Treaty on the European Union. In: European Union (2012). Consolidated version of the Treaty on the European Union. Official Journal of the European Union, C 326/13 - C 326/45, 26.10.2012. Available at: https://eur-lex.europa.eu/resource.html?uri=cellar:2bfl40bf-a3f8-4ab2-b506-fd71826e6da6.0023.02/DOC_1&format=PDF. Accessed on 05 February 2024.

⁸²⁷ European Union (2021b). Communication from the European Commission ‘Pathway to a Healthy Planet for All EU Action Plan: ‘Towards Zero Pollution for Air, Water and Soil’. Available at: <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52021DC0400>. Accessed on 20 June 2023.

⁸²⁸ European Commission (2018). *Ob. cit.*, n.p.

⁸²⁹ Kirchherr, J.; *et. al.* (2017). *Ob. cit.*, p. 222.

⁸³⁰ Liu, Z.; *et. al.* (2018). Are exports of recyclables from developed to developing countries waste pollution transfer or part of the global circular economy? **Resources, Conservation and Recycling**, vol. 136, p. 24. Available at: <https://www.sciencedirect.com/science/article/abs/pii/S0921344918301368>. Accessed on 13 May 2023.

⁸³¹ Desing, H.; *et. al.* (2020). *Ob. cit.*, p. 2.

For instance, China's main national-level framework for implementing CE is the Circular Economy Promotion Law⁸³². In both China and the EU, CE is generally described as a new model for reconciling economic and environmental imperatives. Nevertheless, within this broad framework, there are discrepancies. The Chinese approach treats the CE as a mechanism that is intended to solve problems arising from the country's rapid industrialisation and economic growth, which have brought serious environmental damage. In the EU, diversely, the implementation of a CE is allied to the promotion of environmental objectives, economic competitiveness, and innovation⁸³³.

These different proposals for the conception of a CE – which might even lead to a collapse of the concept itself⁸³⁴ – enable the flow of plastic waste between States, depending on how they envision their own CE strategies; and most of the global trade of waste takes place from developed countries to LMICs. For instance, between 2006 and 2012, China's plastic waste imports increased from around five to more than eight million metric tons, while at the same time, 87% of plastic waste exports from EU Member States were shipped to China⁸³⁵.

For the exporting countries, sending processed plastic waste to China and neighbouring countries was an escape – or “a way out” – from managing that waste, preventing it from going to landfills or to be incinerated in their places of origin⁸³⁶.

In those circumstances, in 2017 the Chinese government announced a ban on the import of 24 categories of materials and solid waste, including plastics, which entered into force in 2018 and generated an enormous pressure on developed countries around the world⁸³⁷, and consequently triggered a new approach to the EU for the management of plastic waste.

⁸³² For more, see China (2008). Circular Economy Promotion Law of the People's Republic of China. Available at: <https://leap.unep.org/countries/cn/national-legislation/circular-economy-promotion-law-peoples-republic-china#:~:text=Circular%20Economy%20Promotion%20Law%20of%20the%20People's%20Republic%20of%20China,-Country&text=This%20Law%20is%20formulated%20for,environment%20and%20realizing%20sustainable%20development>. Accessed on 13 July 2023.

⁸³³ McDowall, W.; *et al.* (2017). Circular Economy Policies in China and Europe. **Journal of Industrial Ecology, Research and Analysis**, vol 21, n. 3, p. 652. Available at: <https://onlinelibrary.wiley.com/doi/10.1111/jiec.12597>. Accessed on 22 May 2023.

⁸³⁴ Kirchherr, J.; *et al.* (2017). *Ob. cit.*, p. 221.

⁸³⁵ Liu, Z.; *et al.* (2018). *Ob. cit.*, p. 3.

⁸³⁶ Brooks, A.L.; *et al.* (2018). The Chinese import ban and its impact on global plastic waste trade. **Science Advances**, vol. 4, n. 6, p. 1. Available at: <https://www.science.org/doi/pdf/10.1126/sciadv.aat0131>. Accessed on 22 May 2023.

⁸³⁷ Liu, Z.; *et al.* (2018). *Ob. cit.*, p. 3.

The most incisive regional actions regarding the management of plastics, in the case of the EU, therefore, are closely related to this Chinese restriction. The major consequences of these measures are analysed in Subsection B “2.2.1.2” below.

2.2.1.2 The Impact of International Trade on Plastic Pollution: Unsustainable Alternatives for Plastic Waste Management

Since the late 1990s, the shipment of plastic waste from developed countries to LMICs has been on the rise. In the 2000s the world seemed uninterested in the export of plastic waste. Europe produced millions of tons of polymers every year without any public clamour on the issue. In fact, most Western plastic was transported to China, the world's largest buyer of plastic waste at that time⁸³⁸ – more specifically, from 1992 to 2018, China accounted for 45% of the world's total plastic waste imports⁸³⁹.

In 2015, developed nations were exporting vast amounts of mixed plastic waste to the Global South – meaning that a significant portion of the marine debris in the ocean originated from wealthier countries⁸⁴⁰. Fast forward to 2016, China imported 7.3 million tons of this waste, equal to 56% of the entire global production. In the same year, it produced 77.17 million tons of it on its own, equal to 23% of global production⁸⁴¹.

On July 27, 2017, however, China made a shocking announcement: it would no longer import plastic from Europe⁸⁴². The ban “Prohibition of Foreign Garbage Imports: the reform plan of solid waste import management”, later called “China ban”, covered 24 types of solid waste, including plastic. This led to a significant drop in global plastic waste trade and shifts in how countries managed litter⁸⁴³.

The Chinese decision is a direct consequence of the growing concerns about the harmful effects of waste imports on public health and the Chinese environment⁸⁴⁴. It is estimated that around 70% of the millions of tons of imported plastic have ended up buried in landfills or managed without criteria⁸⁴⁵.

⁸³⁸ Wen, Z.; *et al.* (2021). China's plastic import ban increases prospects of environmental impact mitigation of plastic waste trade flow worldwide. **Nature Communications**, vol. 12, n. 425, p. 2. DOI: <https://doi.org/10.1038/s41467-020-20741-9>. Available at: <https://www.nature.com/articles/s41467-020-20741-9>. Accessed on 15 June 2023

⁸³⁹ Interpol (2020). Strategic Analysis Report: Emerging criminal trends in the global plastic waste market since January 2018. Available at: https://www.interpol.int/content/download/15587/file/INTERPOL%20Report%20_criminal%20trends-plastic%20waste.pdf. Accessed on 12 May 2023.

⁸⁴⁰ Clift, R.; *et al.* (2019). *Ob. cit.*, p. 103.

⁸⁴¹ Chen, Y.; *et al.* (2019). Life cycle assessment of end-of-life treatments of waste plastics in China. **Resources, conservation and recycling**, vol. 146, p. 348. DOI: <https://doi.org/10.1016/j.resconrec.2019.03.011>. Available at: <https://www.sciencedirect.com/science/article/pii/S092134491930117X>. Accessed on 19 September 2024.

⁸⁴² Cipolloni, D.; *et al.* (2023). **Mal di plastica: verità e bugie sul materiale che ha sommerso il mondo ed è entrato nel nostro sangue**. Bari: Edizioni Dedalo, p. 71. ISBN 978-88-220-4904-9.

⁸⁴³ Wen, Z.; *et al.* (2021). *Ob. cit.*, p. 1.

⁸⁴⁴ Cipolloni, D.; *et al.* (2023). *Ob. cit.*, p. 72.

⁸⁴⁵ Wen, Z.; *et al.* (2021). *Ob. cit.*, p. 2.

This led to an incalculable environmental damage for Chinese soils and waters, for the entire water system and for the consequences on people's health. On the other hand, the European recycling industry had been “spoiled” for decades by the potential of Chinese imports and then found itself unprepared to manage all the plastic produced and discarded⁸⁴⁶.

These restrictive measures, although motivated by environmental concerns, raise significant questions regarding their compatibility with multilateral trade obligations. From a legal standpoint, it must be noted that import restrictions or bans adopted by certain countries (as illustrated by the so-called “China ban”) give rise to doubts about their consistency with the obligations stemming from the General Agreement on Tariffs – GATT (1994) of the WTO⁸⁴⁷.

In particular, Article XI of the GATT generally prohibits quantitative restrictions on imports:

1. No prohibitions or restrictions other than duties, taxes or other charges, whether made effective through quotas, import or export licences or other measures, **shall be instituted or maintained by any contracting party on the importation of any product of the territory of any other contracting party or on the exportation or sale for export of any product destined for the territory of any other contracting party**⁸⁴⁸. (*author's emphasis*)

Based on the broad interpretation of Article XI:1 of the GATT established by WTO case law, virtually any quantitative restriction imposed in the plastics sector could be deemed to violate this provision. However, Article XI:1 of the GATT does not apply to measures that concern the quality rather than the quantity of imports; the restrictive elements of such measures must instead be assessed under the WTO Agreement on Technical Barriers to Trade (TBT)⁸⁴⁹.

Technical regulations are subject to the following basic rules, as established in the WTO TBT Agreement and the GATT. Regarding non-discriminatory treatment, Article 2.1 of the TBT Agreement and Articles I:1 and III:4 of the GATT provide that

⁸⁴⁶ Cipolloni, D.; *et. al.* (2023). *Ob. cit.*, p. 72.

⁸⁴⁷ The 1994 GATT is contained in Annex 1A of the WTO Agreement. It incorporates by reference the provisions of the 1947 GATT, a legally distinct international treaty that was applied provisionally from 1948 to 1995. In: WTO (1994a). General Agreement on Tariffs and Trade 1994. Adopted 15 April 1994, entered into force 1 January 1995. Available at: https://www.wto.org/english/docs_e/legal_e/gatt94_e.htm. Accessed on 30 August 2025.

⁸⁴⁸ *Ibidem*.

⁸⁴⁹ Espa, I.; Imeli, B. (2021). Restrictions to Transboundary Movements of Plastics and WTO Law: A Policy Brief. Swiss Network for International Studies (SNIS), Policy Brief. Available at: https://snis.ch/wp-content/uploads/2020/01/2019_Littoz-Monnet_Working-Paper-8.pdf. Accessed on 30 August 2025.

2.1 Members shall ensure that in respect of technical regulations, products imported from the territory of any Member shall be accorded **treatment no less favourable than that accorded to like products of national origin** and to like products originating in any other country⁸⁵⁰.

I.1. With respect to customs duties and charges of any kind imposed on or in connection with importation or exportation or imposed on the international transfer of payments for imports or exports, and with respect to the method of levying such duties and charges, and with respect to all rules and formalities in connection with importation and exportation, and with respect to all matters referred to in paragraphs 2 and 4 of Article III, **any advantage, favour, privilege or immunity granted by any contracting party to any product originating in or destined for any other country shall be accorded immediately and unconditionally to the like product originating in or destined for the territories of all other contracting parties.**

III.4 The products of the territory of any contracting party imported into the territory of any other contracting party **shall be accorded treatment no less favourable than that accorded to like products of national origin in respect of all laws, regulations and requirements affecting their internal sale, offering for sale, purchase, transportation, distribution or use.** The provisions of this paragraph shall not prevent the application of differential internal transportation charges which are based exclusively on the economic operation of the means of transport and not on the nationality of the product⁸⁵¹.
(author's emphasis)

Furthermore, the TBT Agreement establishes that regulations must not be more trade-restrictive than necessary (art. 2.2 TBT: “technical regulations shall not be more trade-restrictive than necessary to fulfil a legitimate objective, taking account of the risks non-fulfilment would create”); that they must, where relevant, be based on international standards (Art. 2.4 TBT: “Where technical regulations are required and relevant international standards exist or their completion is imminent, Members shall use them, or the relevant parts of them”); and that requirements should be specified in terms of performance rather than design or descriptive characteristics (Art. 2.8 TBT: “Members shall specify technical regulations based on product requirements in terms of performance rather than design or descriptive characteristics”)⁸⁵².

In order to balance Members' right to protect important social values with the rights of other Members under the core trade disciplines, Article XX of the GATT allows Members to deviate from any GATT provision (including Articles XI:1, I:1, and III:4) to the extent that they adopt measures which can be provisionally justified⁸⁵³ under one of the paragraphs of Article XX, provided that such measures also meet the requirements of the chapeau

⁸⁵⁰ WTO (1994b). Agreement on Technical Barriers to Trade. Adopted as part of the Uruguay Round agreements and entered into force on January 1, 1995. Available at: https://www.wto.org/english/docs_e/legal_e/tbt_e.htm. Accessed on 20 August 2025.

⁸⁵¹ WTO (1994a). *Ob. cit.*, n.p.

⁸⁵² WTO (1994b). *Ob. cit.*, n.p.

⁸⁵³ Espa, I.; Imeli, B. (2021). *Ob. cit.*, p. 4-5.

Articolo XX – *General Exceptions*

Subject to the requirement that such measures **are not applied in a manner which would constitute a means of arbitrary or unjustifiable discrimination between countries where the same conditions prevail**, or a **disguised restriction on international trade**, nothing in this Agreement shall be construed to prevent the adoption or enforcement by any contracting party of measures:

- (a) necessary to protect public morals;
- (b) **necessary to protect human, animal or plant life or health**;
- (...)
- (g) relating to the **conservation of exhaustible natural resources** if such measures are made effective in conjunction with restrictions on domestic production or consumption;
- (...)⁸⁵⁴ (*author's emphasis*)

Similar considerations may resolve a potential conflict with Article 2.1 of the TBT Agreement. For instance, technical regulations that apply exclusively to imports of plastic waste – and thus may violate the national treatment obligation – can nevertheless be justified, particularly when they are adopted in accordance with the Basel Convention⁸⁵⁵.

WTO Members may adopt measures that deviate from international trade rules to the extent that they are aimed at protecting public health and/or the environment. Important prerequisites for doing so include that any trade restrictions or implicit discrimination must be functionally related to the regulatory objective of the measures and, where possible, be the subject of negotiations with the affected Members⁸⁵⁶.

In general terms, trade restrictions on plastic waste, even when applied solely to foreign products, could still be justified – provided they are not applied in an arbitrary manner.

These provisions therefore offer a legal basis to justify national measures that restrict trade in plastic waste, as long as they are not implemented in a discriminatory or protectionist way, as illustrated by the case of the “China ban”.

The lack of sustainable alternatives, however, has highlighted that the multilateral trade framework and its environmental exceptions remain insufficient to ensure a fair and effective management of plastic waste. Following the Chinese ban, exporting countries experienced a sharp increase in illegal landfilling and unauthorised burning, practices adopted as a cost-effective solution to actually handling the large volumes of domestic waste that could no longer be sent to the Chinese market⁸⁵⁷.

In the emerging Asian countries acting as importers, the sharp increase in plastic waste imports, combined with weak enforcement mechanisms, has likely contributed to

⁸⁵⁴ WTO (1994a). *Ob. cit.*, n.p.

⁸⁵⁵ And the 2019 amendments. For further details, *see supra* note 180.

⁸⁵⁶ Espa, I.; Imeli, B. (2021). *Ob. cit.*, p. 9-15.

⁸⁵⁷ Interpol (2020). *Ob. cit.*, p. 6.

the proliferation of illegal recycling facilities. These operations profit by evading licensing fees and the costs associated with environmentally responsible waste treatment. Moreover, this trend has probably led to a rise in unauthorised landfill sites, particularly for domestically generated plastic waste, which tends to be of lower quality than imported waste owing to the inadequacy of local collection and sorting systems⁸⁵⁸.

In light of this scenario, it was only after the “China ban” that the European Union made significant efforts to manage plastic waste within the continent, adopting strategies and directives such as the 2018 Plastics Strategy⁸⁵⁹ and Directive (EU) 2019/904 on the reduction of the impact of certain plastic products on the environment⁸⁶⁰. The latter, in addition to contextualising the core issue that led to its adoption, aimed to prohibit the use of certain single-use plastic items within the Union by 2021, including plates, cutlery, straws and disposable cotton buds⁸⁶¹.

This specific directive expressly stated that, for efforts to prevent and tackle marine litter to be effective, it would be essential to ensure that exports of plastic waste from the EU did not result in an increase in marine litter in other countries⁸⁶².

The reality, however, is that it is very difficult to evaluate the achievement of this goal – mainly because there is a lack of official information from the industry or governments concerning the true destiny of plastics exported outside the EU for recycling. The fate of this material in importing countries is not well documented: it is known, nevertheless, that a significant fraction of imported plastic destined for recycling ends up in landfills, and approximately 24% of rejected plastics potentially enters the ocean⁸⁶³.

Not to mention the working conditions of the recyclers, which involve several social issues, considering that the process of recycling plastic waste is typically carried

⁸⁵⁸ Interpol (2020). *Ob. cit.*, p. 6.

⁸⁵⁹ European Union (2018). *Ob. cit.*, n.p.

⁸⁶⁰ The “China ban” determined trade adjustments and responsive regulatory and enforcement policies globally. In: Interpol (2020). *Ob. cit.*, p. 17.

⁸⁶¹ Indeed, quantitative restrictions and technical regulations on plastic products must be applied in a manner that is neutral with respect to origin and, therefore, also affect domestic products. A significant example is provided by Directive (EU) 2019/904, which meets this requirement: the labelling obligation set out in Article 7 (“Marking requirements”), for instance, applies to all products covered, regardless of their place of manufacture. This does not exclude, however, that trade restrictions concerning plastic waste – even when directed solely at foreign products – may still be justified, provided that they are not applied in an arbitrary or discriminatory manner. In: European Union (2019b). Directive (EU) 2019/904 of the European Parliament and of the Council of 5 Giugno 2019 on the reduction of the impact of certain plastic products on the environment. Available at: <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32019L0904&qid=1694190120550>. Accessed on 23 May 2023.

⁸⁶² *Ibidem*.

⁸⁶³ Bishop, G.; *et. al.* (2020). Recycling of European plastic is a pathway for plastic debris in the ocean. **Environmental International**, vol. 142, p. 2. Available at: <https://www.sciencedirect.com/science/article/pii/S0160412020318481>. Accessed on 11 June 2023.

out in an informal context, where children and women are involved and directly exposed to the risk of serious health problems⁸⁶⁴. Despite that, waste is still increasingly moving across EU borders⁸⁶⁵.

Europe produced around 57.2 million tonnes of plastic in 2021, and the increase in primary plastic production is estimated to be 1.5% per year until 2025. The structures to manage the end-of-life of all the plastic produced simply do not exist⁸⁶⁶.

The “only” way remaining would be to transfer the waste elsewhere: since the recycling industry in export countries is unable to handle the growing waste accumulation, the primary solution for waste that was previously exported to China is now redirect it to alternative destinations. In alternative, this waste might be incinerated or disposed in landfills within the country of origin⁸⁶⁷.

This is how new routes for European waste are being created, especially towards South-East Asia, from Malaysia to Vietnam – in fact, after the “China ban”, Malaysia became the preferred destination for this waste, receiving more than 250 containers of illegally imported plastic waste from several states in 2018 alone⁸⁶⁸.

The country, however, decided to start sending back unwanted waste and reported that since 2019 at least 267 containers of illegal plastic waste have been returned to their places of origin⁸⁶⁹. In this same trend, Thailand recently decided to ban plastic waste imports as well⁸⁷⁰. Currently, among OECD countries, the preferred destination is Turkey⁸⁷¹.

⁸⁶⁴ Salhofer, S.; *et al.* (2021). Plastic Recycling Practices in Vietnam and Related Hazards for Health and the Environment. **International Journal of Environmental Research and Public Health**, vol 18, p. 5. Available at: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8071425/pdf/ijerph-18-04203.pdf>. Accessed on 02 July 2023.

⁸⁶⁵ European Environment Agency (2016). EU exporting more waste, including hazardous waste. Available at: <https://www.eea.europa.eu/highlights/eu-exporting-more-waste-including>. Accessed on 02 May 2023.

⁸⁶⁶ Plastics Europe (2022). Plastics – the Facts 2022. Belgium: Brussels, p. 28. Available at: https://plasticseurope.org/wp-content/uploads/2022/10/PE-PLASTICS-THE-FACTS_V7-Tue_19-10-1.pdf. Accessed on 19 June 2023.

⁸⁶⁷ Interpol (2020). *Ob. cit.*, p. 17.

⁸⁶⁸ Ng, K.S.; Iacovidou, E. (2020). Malaysia Versus Waste. **The Chemical Engineer**, issue 949/50, p. 31. Available at: <https://www.thechemicalengineer.com/magazine/issues/issue-94950/>. Accessed on 19 August 2023.

⁸⁶⁹ Lumpur, K. (2021). Malaysia sends back over 300 containers of illicit plastic waste. Reuters, World. Available at: <https://www.reuters.com/article/world/malaysia-sends-back-over-300-containers-of-illicit-plastic-waste-idUSKBN2BT29H/>. Accessed on 17 June 2023.

⁸⁷⁰ Environmental Investigation Agency (2025). Thailand’s plastic waste imports ban welcome but a global treaty is needed to properly tackle the issue. Available at: <https://eia-international.org/news/thailands-plastic-waste-imports-ban-welcome-but-a-global-treaty-is-needed-to-properly-tackle-the-issue/>. Accessed on 14 February 2025.

⁸⁷¹ Cipolloni, D.; *et al.* (2023). *Ob. cit.*, p. 74-75.

In fact, it is due to regulatory differences that it is common that plastic waste “leaks” from the EU to jurisdictions with lower environmental standards, or the so-called “linear production heavens”⁸⁷².

Although many Member States of the EU are part of the “High Ambition Coalition to end plastic pollution” (HAC)⁸⁷³, the HAC countries are the leading exporters of plastic waste to LMICs⁸⁷⁴. The exports of waste from the EU to non-EU countries have increased by two thirds since 2004 and in 2019, they reached 31 million tonnes. In 2022, this number was equal to 32.1 million tonnes (of waste exported to countries outside the EU)⁸⁷⁵. EU plastic waste exports to non-OECD countries rose by 74% from 2021 (39.6 million kg/month) to August 2024 (69 million kg/month)⁸⁷⁶.

Turkey became one of the largest destinations for waste exported from the EU, with a volume of around 14.7 million tonnes in 2021⁸⁷⁷ and 12.4 million tonnes in 2022, accounting for 39% of the total exports of waste⁸⁷⁸. When it comes to plastic waste, more specifically, this constant remains, because Turkey is the main destination for EU exports of plastic waste since 2020, and in 2023 these exports accounted for a volume of 315.624 metric tons⁸⁷⁹, as Figure 30 illustrates:

⁸⁷² The World Bank (2022). *Squaring the Circle: Policies from Europe’s Circular Economy Transition*. 1st Edition. Washington DC: World Bank Publications, p. 51. Available at: <https://www.worldbank.org/en/region/eca/publication/squaring-circle-europe-circular-economy-transition>. Accessed on 12 July 2023.

⁸⁷³ The High Ambition Coalition to End Plastic Pollution is dedicated to creating a robust international LBI that adopts a comprehensive, circular approach, ensuring immediate action and impactful measures throughout the entire lifecycle of plastics. They declare that their shared goal is to eliminate plastic pollution by 2040. In: HAC (2024). *End Plastic Pollution by 2040*. Available at: <https://hactoendplasticpollution.org/>. Accessed on 12 February 2025.

⁸⁷⁴ Basel Action Network (2025). *Plastic Waste Trade Data*. Available at: <https://www.ban.org/plastic-waste-transparency-project-hub/trade-data>. Accessed on 15 February 2025.

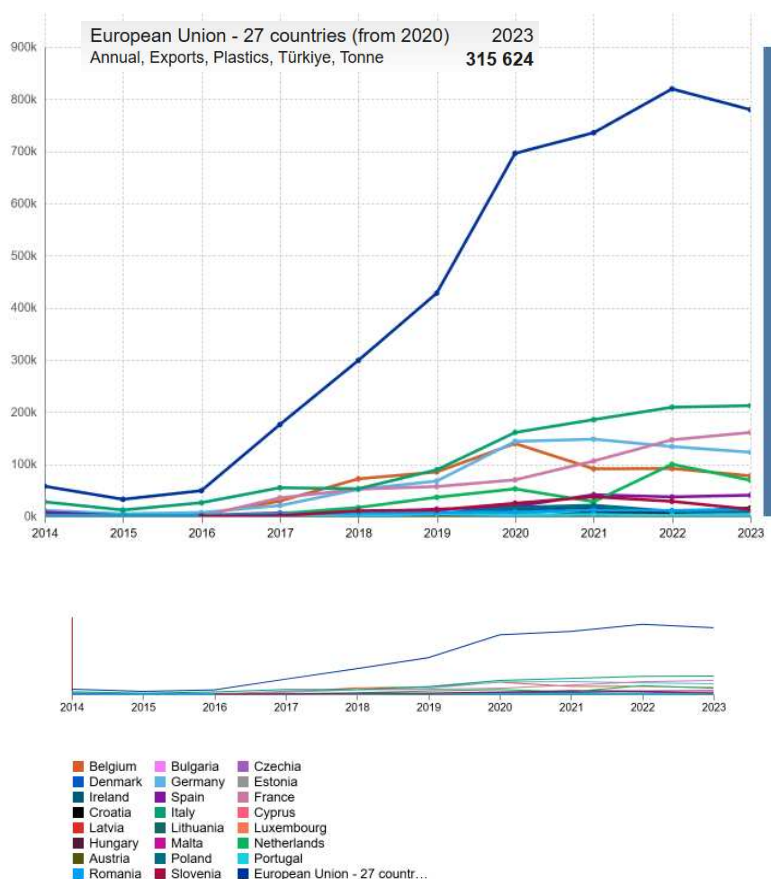
⁸⁷⁵ Eurostat (2024a). EU exported 32 million tonnes of waste in 2022. Available at: <https://ec.europa.eu/eurostat/web/products-eurostat-news/w/ddn-20240118-1>. Accessed on 12 February 2025.

⁸⁷⁶ Basel Action Network (2025). *Ob. cit.*, n.p.

⁸⁷⁷ Eurostat (2022). What are the main destinations of EU export of waste? Available at: <https://ec.europa.eu/eurostat/web/products-eurostat-news/-/ddn-20220525-1>. Accessed on 17 June 2023.

⁸⁷⁸ Eurostat (2024a). *Ob. cit.*, n.p.

⁸⁷⁹ Statista (2024). Main destinations for plastic waste exports from the European Union (EU-27) in 2023, by country. Available at: <https://www.statista.com/statistics/1269996/plastic-waste-export-destinations-european-union/>. Accessed on 18 October 2024.

Figure 30 – Trade in waste by type of material and partner (Turkey)⁸⁸⁰

Source: Eurostat (2024a).

Exports to Turkey also remained significant in August 2024, reaching 29.1 million kg/month⁸⁸¹. Adana, in southern Turkey, is where nearly 50% of the country's plastic waste imports end up⁸⁸². The workers in plastic recycling plants and nearby residents are constantly being exposed to harmful chemicals⁸⁸³, besides having to deal with European plastic that citizens in their own countries have sorted, local municipalities have collected, and that has been sold to Turkey for recycling⁸⁸⁴.

Because, according to the Basel Convention on the export of waste from Europe, it is allowed to export plastic waste for the purpose of recycling – considering that the

⁸⁸⁰ This graphic has been created automatically by ESTAT/EC software according to external user specifications. In: Eurostat (2024b). Trade in waste by type of material and partner. DOI: 10.2908/env_wastrdmp. Available at: https://ec.europa.eu/eurostat/databrowser/view/env_wastrdmp__custom_15346011/default/line?lang=en. Accessed on 12 February 2025.

⁸⁸¹ Basel Action Network (2025). *Ob. cit.*, n.p.

⁸⁸² Cipolloni, D.; *et al.* (2023). *Ob. cit.*, p. 72.

⁸⁸³ Plastics, composed of fossil fuels and chemical additives, emit harmful air pollutants and toxins during recycling, threatening public health.

⁸⁸⁴ Human Rights Watch (2022). "It's as If They're Poisoning Us" - The Health Impacts of Plastic Recycling in Turkey. Available at: https://www.hrw.org/sites/default/files/media_2022/09/turkey0922web_0.pdf. Accessed on 17 September 2023.

amendments regarding plastics under the Convention do not constitute a complete ban on the import, transit, or export of plastic waste; instead, they provide clarification on when and how the Convention applies to such waste⁸⁸⁵. In this regard, Decision BC-14/12 provides that

(...) Plastic waste listed below, provided it is destined for recycling⁸⁸⁶ in an **environmentally sound manner** and almost free from contamination and other types of wastes:

- Plastic waste almost exclusively consisting of one non-halogenated polymer, including but not limited to the following polymers:

- Polyethylene (PE)
- Polypropylene (PP)
- Polystyrene (PS)
- Acrylonitrile butadiene styrene (ABS)
- Polyethylene terephthalate (PET)
- Polycarbonates (PC)
- Polyethers

- Plastic waste almost exclusively consisting of one cured resin or condensation product, including but not limited to the following resins:

- Urea formaldehyde resins
- Phenol formaldehyde resins
- Melamine formaldehyde resins
- Epoxy resins
- Alkyd resins

- Plastic waste almost exclusively consisting of one of the following fluorinated polymers⁸⁸⁷:

- Perfluoroethylene/propylene (FEP)
- Perfluoroalkoxy alkanes:
 - Tetrafluoroethylene/perfluoroalkyl vinyl ether (PFA)
 - Tetrafluoroethylene/perfluoromethyl vinyl ether (MFA)

Polyvinylfluoride (PVF) o Polyvinylidene fluoride (PVDF)

- Mixtures of plastic waste, consisting of polyethylene (PE), polypropylene (PP) and/or polyethylene terephthalate (PET), provided they are destined for separate recycling of each material and in an environmentally sound manner and almost free from contamination and other types of wastes⁸⁸⁸. (*author's emphasis*)

This situation only exacerbates how detrimental the gaps in international law regarding plastic pollution and PWM are to all humanity. The plastic discovered in Adana's informal landfills is a byproduct of an export system that has been ongoing for years – and evidently something went wrong⁸⁸⁹.

⁸⁸⁵ BRS (2022). Questions and answers related to the Basel Convention Plastic Waste Amendments. Available at: <https://www.basel.int/implementation/plasticwaste/plasticwasteamendments/faqs/tabid/8427/default.aspx>. Accessed on 21 January 2023.

⁸⁸⁶ Recycling/reclamation of organic substances that are not used as solvents (R3 in Annex IV, sect. B) or, if needed, temporary storage limited to one instance, provided that it is followed by operation R3 and evidenced by contractual or relevant official documentation.

⁸⁸⁷ Post-consumer wastes are excluded.

⁸⁸⁸ Decision BC-14/12: Amendments to Annexes II, VIII and IX to the Basel Convention, entry Y48.

⁸⁸⁹ Cipolloni, D.; *et. al.* (2023). *Ob. cit.*, p. 76.

Along with the complexity of conducting a life cycle assessment of plastics due to the wide variety of chemical compositions, the near impossibility of tracking a plastic product – from raw material extraction through manufacturing, use, and disposal – is another significant challenge in PWM. Besides, it is difficult to even find reliable sources of information regarding the emissions associated with the transportation and export of plastic products on the global market⁸⁹⁰.

Although several international agreements, such as the Basel Convention, include PIC protocols designed to track the export of plastic products and waste⁸⁹¹, these protocols are frequently ignored⁸⁹², particularly when the recipient country is less economically developed. Global waste trade and exports consistently undermine the principles of proximity and self-sufficiency⁸⁹³, allowing countries to shift the responsibility of waste processing onto others. Additionally, it creates problems for waste-importing countries, as the burden increases when they lack the necessary facilities and mechanisms to manage disposal⁸⁹⁴.

This underscores a stark injustice in the global plastic waste trade: wealthy nations and the largest plastic producers persist in prioritising their own convenience, relying on waste exports to mitigate their excessive consumption and offload the toxic burden from their own environments. This ongoing situation continues to inflict harm on the Global South, where communities bear the brunt of pollution, hazardous fumes, and health risks from both managing waste and mismanaged waste⁸⁹⁵. In fact, it was revealed that two workers recently lost their lives from suffocation due to poor working conditions at a plastic recycling facility in Nairobi⁸⁹⁶.

⁸⁹⁰ UNEP (2021d). *Ob. cit.*, p. 30.

⁸⁹¹ For instance, Article 3.6 of the Basel Convention provides that “The State of export shall not allow the generator or exporter to commence the transboundary movement until it has received written confirmation that: (a) The notifier has received the written consent of the State of import; and (b) The notifier has received from the State of import confirmation of the existence of a contract between the exporter and the disposer specifying environmentally sound management of the wastes in question.”

⁸⁹² Raubenheimer, K.; McIlgorm, A. (2018). *Ob. cit.*, p. 285.

⁸⁹³ A core principle of waste management programs is the “proximity principle”, which advocates for waste disposal to occur as close as possible to its place of production when reuse is not feasible. According to the proximity principle, waste should be managed using the most advanced technology available, ensuring the highest level of protection for both the environment and human health. Instead, the self-sufficiency principle primarily seeks to promote or require individual responsibility for managing the waste generated by an entity. In: Skroback, A.E. (1994). *Even a Sacred Cow Must Live in a Green Pasture: The Proximity Principle, Free Movement of Goods, and Regulation 259/93 on Transfrontier Waste Shipments Within the EC*. **Boston College International and Comparative Law Review**, vol. 17, p. 87. Available at: <https://lira.bc.edu/work/sc/28766217-461c-4927-84aa-d8fc26ba67c5>. Accessed on 15 June 2023.

⁸⁹⁴ UNEP (2021d). *Ob. cit.*, p. 30.

⁸⁹⁵ Salhofer, S.; *et. al.* (2021). *Ob. cit.*, p. 5.

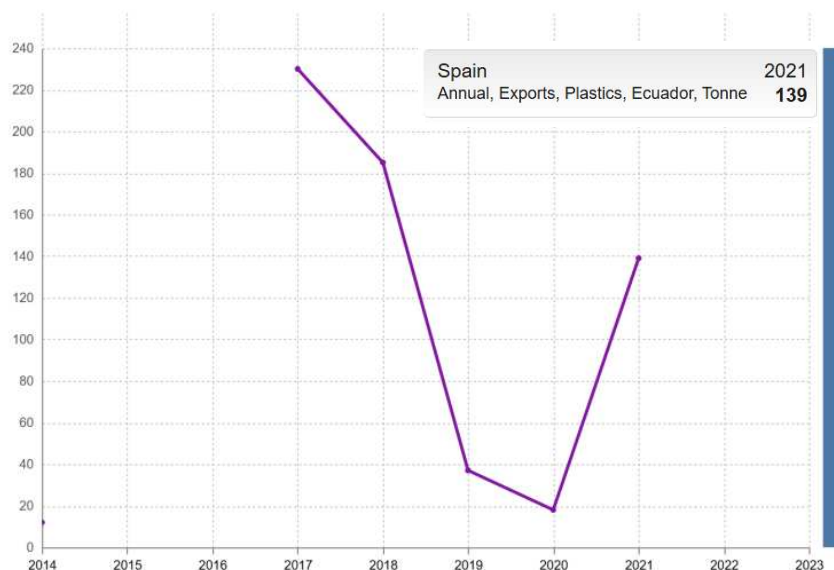
⁸⁹⁶ The incident happened when the workers entered a pit, said to be used for mixing chemicals, and were overwhelmed by a lack of oxygen. In: Odindo, N. (2025). *Nairobi: Pain as 2 Workers Suffocate to Death*

In the scenario, a Circular Economy Coalition of Latin America and the Caribbean was launched in 2021⁸⁹⁷, coordinated by the UNEP during the XXII Forum of Ministers of Environment of LAC⁸⁹⁸.

In an effort to position the LAC region as a significant actor and a global leader in the transition to a low-carbon and SDG-aligned economy, the Coalition seeks to forge a common perspective for the CE. The vision aims to build up existing CE transition initiatives that are now taking place in various countries throughout the region⁸⁹⁹.

Despite that, although LAC is not the main destinations of the EU's plastic waste, it is still affected by imported waste that will most likely be mismanaged. Most of the plastic waste dumped in LAC comes from the USA, but Ecuador, for example, was able to determine the source of plastic debris imported, which came from at least 37 nations across three continents between 2014 and 2020, including from the EU⁹⁰⁰ – within the European continent, the most expressive exports come from Spain, as Figure 31 shows:

Figure 31 – Trade in waste by type of material and partner (Ecuador)⁹⁰¹



Source: Eurostat (2024b).

at Plastic Recycling Company. Available at: <https://www.tuko.co.ke/kenya/counties/574303-nairobi-pain-2-workers-suffocate-death-plastic-recycling-company/>. Accessed on 14 February 2025.

⁸⁹⁷ Circular Economy Coalition (2021). Latin America and the Caribbean launches the Circular Economy Coalition. Available at: <https://coalicioneconomicircular.org/en/latin-america-and-the-caribbean-launches-the-circular-economy-coalition/>. Accessed on 03 July 2023.

⁸⁹⁸ UNEP (2021). XXII Forum of Ministers of Environment of Latin America and the Caribbean. Available at: <https://www.unep.org/events/unep-event/xxii-forum-ministers-environment-latin-america-and-caribbean>. Accessed on 03 July 2023.

⁸⁹⁹ Circular Economy Coalition (2022). Circular Economy in Latin America and the Caribbean: A Shared Vision. Available at: <https://www.unep.org/resources/publication/circular-economy-latin-america-and-caribbean-shared-vision>. Accessed on 07 July 2023.

⁹⁰⁰ Global Alliance for Incinerator Alternatives (2021). *Ob. cit.*, p. 9.

⁹⁰¹ This graphic has been created automatically by ESTAT/EC software according to external user specifications.

Exporting plastic waste to countries that still do not have the verified or proven capacity to manage it means transferring the problem and worsening an environmental situation that affects the entire world's population somehow; therefore, going against the EU's own objectives⁹⁰².

To illustrate this situation, the case of Brazil can be explored: the country is at the top of the 18 megadiverse countries, harbouring between 15 and 20 percent of the world's biological diversity, with more than 120.000 species of invertebrates, about 9.000 vertebrates and more than 4.000 species of plants⁹⁰³.

If the EU exports more and more plastic waste to Brazil⁹⁰⁴ without the guarantee that the residues that arrive there will be controlled and properly managed, it means that this export, on the one hand, transfers the problem of waste management to a third country; and, on the other hand, is potentially putting at risk natural resources that are important for all humanity.

Despite this scenario, it is interesting to note that the EU has been trying to disassociate itself from these actions – which comes at an interesting time, given that negotiations for a future LBI on plastic pollution are underway, as discussed in Part II of this thesis.

A promising measure taken by the EU is the 2021 proposed revision of the current rules on waste shipments. Before delving deeper into the proposal – which was recently adopted and entered into force, starting to apply by 2026 –, it is worth noticing that waste transportation within and beyond EU borders is currently still regulated by the EU Waste Shipment Regulation EC 1013 of 2006, and by the recent amendment through Delegated Regulation (EU) 2020/2174, which restricts waste trade on certain plastics (like hazardous and non-hazardous plastic waste that are hard to recycle from the EU to non-OECD States⁹⁰⁵).

⁹⁰² Hsu, W.T.; *et. al.* (2022). Closing the loop on plastics in Europe: The role of data, information and knowledge. **Sustainable Production and Consumption**, vol. 33, p. 944. DOI: <https://doi.org/10.1016/j.spc.2022.08.019>. Available at: <https://www.sciencedirect.com/science/article/pii/S2352550922002251>. Accessed on 21 May 2023.

⁹⁰³ UNEP (2019e). Megadiverse Brazil: giving biodiversity an online boost. Available at: <https://www.unep.org/news-and-stories/story/megadiverse-brazil-giving-biodiversity-online-boost#:~:text=Brazil%20is%20at%20the%20top,more%20than%204%2C000%20plant%20species>. Accessed on 20 May 2023.

⁹⁰⁴ The impact of plastic has been reaching all Latin America, and today countries like Mexico and Ecuador are among the largest importers of plastic, suffering from loopholes in legislation and dealing with inefficient systems of inspection and control. For more, see Global Alliance for Incinerator Alternatives (2021). *Ob. cit.*, p. 3-12.

⁹⁰⁵ Prata, J.C.; *et. al.* (2022). The road to sustainable use and waste management of plastics in Portugal. **Frontiers of Environmental Science & Engineering**, vol. 16, n. 5, p. 4. Available at: <https://doi.org/10.1007/s11783-021-1439-x>. Accessed on 20 December 2023.

Exports of waste from the EU to third countries, nonetheless, have increased significantly since the Regulation's adoption in 2006, particularly to nations outside of the scope of the OECD. Insufficient regulations aimed at guaranteeing environmentally sound management of waste in the target countries have resulted in weak enforcement and environmental and public health adverse effects.

In 2020, the EU imported about 16 million tonnes of waste and exported about 33 million tonnes to non-EU nations. Furthermore, every year, almost 70 million tonnes of waste are transported between EU countries. The EU's transition to a (real) CE, thus, is being slowed down by administrative procedures that restrict the movement of waste among its Member States⁹⁰⁶.

Aware of these circumstances, the European Commission presented a proposal for a new Waste Shipment Regulation in 2021, putting forward a renovated approach to EU shipments of waste – and thus implementing the commitments of many European policies, such as the new CEAP and the Zero Pollution Action Plan, the new EU Strategy to tackle Organised Crime 2021-2025 and the Green Deal.

The new regulation proposal has three main goals: i) making it simpler to transport waste for recycling and reuse in the EU; ii) better addressing illegal waste shipments; and more importantly iii) ensuring that the EU does not export its challenges regarding waste to third countries⁹⁰⁷.

This new approach is expected to support the transition to an innovative CE by ensuring that the EU does not export its pollution abroad and that waste is treated sustainably both inside and outside the EU. Overall, the EU should be more engaged in preventing waste in order to become more resource-efficient, which is a key element of the 2020 Growth Strategy⁹⁰⁸. But of course, the EU can always go beyond: European countries of origin need as well to take greater responsibility for whom they export plastic waste to.

⁹⁰⁶ European Commission (2021a). Questions and Answers on new EU rules on waste shipments. Available at https://ec.europa.eu/commission/presscorner/detail/en/qanda_21_5918. Accessed on 28 July 2023.

⁹⁰⁷ Especially when the waste to be shipped poses particular challenges, so it is preferred that it remains inside the EU. This option is expected to result in an overall significant positive environmental impact. For more, *see* European Commission (2021b). Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on shipments of waste and amending Regulations (EU) No 1257/2013 and (EU) No 2020/1056. Available at: https://eur-lex.europa.eu/resource.html?uri=cellar:6c0588b1-4878-11ec-91ac-01aa75ed71a1.0001.02/DOC_1&format=PDF. Accessed on 26 December 2023.

⁹⁰⁸ European Union (2020). Communication from the European Commission 'EUROPE 2020 A strategy for smart, sustainable and inclusive growth'. Available at: <https://ec.europa.eu/eu2020/pdf/COMPLET%20EN%20BARROSO%20%20%20007%20-%20Europe%202020%20-%20EN%20version.pdf>. Accessed on 15 May 2023.

Another interesting update in EU rules, in this sense, is the recent Packaging and Packaging Waste Regulation 2025/40 (PPWR) adopted by the Council of the European Union on 16 December 2024⁹⁰⁹. The new rules are expected to substantially decrease packaging waste generation by establishing mandatory re-use targets, limiting specific types of single-use packaging, and obligating economic operators to reduce packaging usage. The PPWR, which is already in force – and shall apply from 12 August 2026⁹¹⁰ –, addresses the entire life cycle of packaging⁹¹¹, and provides, among others, that

Article 6 – Recyclable packaging. 1. All packaging placed on the market shall be recyclable. (...)

Article 7 – Minimum recycled content in plastic packaging. 1. By 1 January 2030 or 3 years from the date of entry into force of the implementing act (...) any plastic part of packaging placed on the market shall contain the following minimum percentage of recycled content recovered from post-consumer plastic waste, per packaging type and format (...):

- (a) 30 % for contact-sensitive packaging made from polyethylene terephthalate (PET) as the major component, except single-use plastic beverage bottles;
- (b) 10 % for contact-sensitive packaging made from plastic materials other than PET, except single-use plastic beverage bottles;
- (c) 30 % for single-use plastic beverage bottles;
- (d) 35 % for plastic packaging other than those referred to in points (a), (b) and (c) of this paragraph. (...)

10. By 31 December 2026, the Commission shall adopt implementing acts establishing the methodology for assessing, verifying and certifying, including through third-party audit, the equivalence of the rules applied in cases where the recycled content recovered from post-consumer plastic waste is recycled or collected in a third country⁹¹². (...)

The PPWR aims to reduce packaging and waste volumes while decreasing the use of primary raw materials and promoting a shift towards a circular, sustainable, and competitive economy.

It introduces a new set of requirements aligned with Europe's waste policies, covering the entire packaging life cycle – from product design to waste management. By

⁹⁰⁹ European Union (2025). REGULATION (EU) 2025/40 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 19 December 2024 on packaging and packaging waste, amending Regulation (EU) 2019/1020 and Directive (EU) 2019/904, and repealing Directive 94/62/EC. Official Journal of the European Union EN, L series, 22.1.2025. Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=OJ:L_202500040. Accessed on 16 February 2025.

⁹¹⁰ The PPWR entered into force on 11 February 2025 and its general date of application is 18 months after that. In: European Commission (2025). Packaging waste. Available at: https://environment.ec.europa.eu/topics/waste-and-recycling/packaging-waste_en. Accessed on 16 February 2025.

⁹¹¹ European Council (2024). Sustainable packaging: Council signs off on new rules for less waste and more re-use in the EU. Available at: <https://www.consilium.europa.eu/en/press/press-releases/2024/12/16/sustainable-packaging-council-signs-off-on-new-rules-for-less-waste-and-more-re-use-in-the-eu/#:~:text=Today%2C%20the%20Council%20formally%20adopted,to%20minimise%20the%20packaging%20used>. Accessed on 19 December 2024.

⁹¹² European Union (2025). *Ob. cit.*, p. 39-43.

2030, these measures are expected to substantially cut GHG emissions and water consumption, while mitigating the negative impacts of packaging and packaging waste on the environment and human health⁹¹³.

Finally, it is worth mentioning one more aspect of international plastics trade, as there is a commodity that has come to the forefront as both an essential resource and a significant environmental issue: plastic pellets, also known as plastic nurdles. These “*tiny bead-like particles*”⁹¹⁴ of plastic represent the second-largest source of primary microplastic pollution worldwide, with an estimated 445.970 tonnes entering the environment each year⁹¹⁵.

To tackle this issue within the context of maritime transport, the IMO is working on guidelines for declaring freight containers carrying plastic pellets to ship operators, as well as for their stowage on ships. Additionally, IMO is developing protocols for the packaging of plastic pellets for maritime transport and creating guidance on how to respond to marine incidents involving plastic pellets⁹¹⁶.

The rapid increase in plastic production has caused a rise in pellet transportation, leading to spills and the loss of containers at sea⁹¹⁷. On 18 January 2024, the European Parliament even held a debate on plastic pellet spills after an ecological disaster occurred along the Spanish coast due to the loss of a container filled with sacks of plastic pellets at sea⁹¹⁸. See Figure 32:

⁹¹³ European Commission (2025). *Ob. cit.*, n.p.

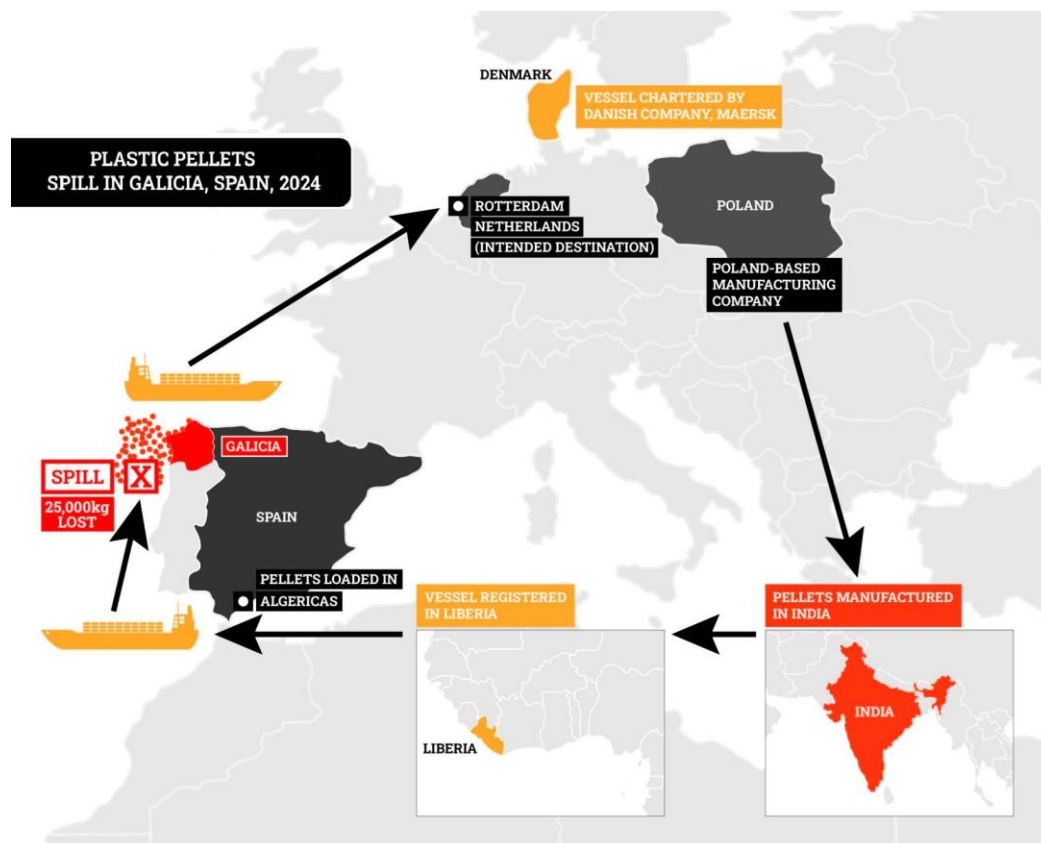
⁹¹⁴ Youngman, A. (2024). Tackling sea-based sources of plastic pollution at the International Maritime Organisation. Environmental Investigation Agency, Legal and Policy Specialist. Available at: <https://eia-international.org/blog/tackling-sea-based-sources-of-plastic-pollution-at-the-international-maritime-organisation/>. Accessed on 17 December 2024.

⁹¹⁵ They consist of tiny plastic granules used in manufacturing of plastic products. In: Galgani, F.; Rangel-Buitrago, N. (2024). White tides: the plastic nurdles problem. **Journal of Hazardous Materials**, vol. 470, p. 1. DOI: <https://doi.org/10.1016/j.jhazmat.2024.134250>. Available at: <https://www.sciencedirect.com/science/article/pii/S030438942400829X>. Accessed on 11 February 2025.

⁹¹⁶ IMO (2024d). FAQ - Plastic pellets. Available at: <https://www.imo.org/en/MediaCentre/HotTopics/Pages/FAQ-Plastic-pellets.aspx>. Accessed on 16 December 2024.

⁹¹⁷ These spills present significant risks to marine ecosystems, as marine life often mistake the pellets for food, resulting in digestive problems, decreased feeding efficiency, and even death. Furthermore, plastic pellets serve as carriers for harmful chemicals, exacerbating the buildup of pollutants in marine organisms. In: Youngman, A. (2024). *Ob. cit.*, n.p.

⁹¹⁸ European Parliament (2025). Reducing microplastic pollution from plastic pellet losses. BRIEFING EU Legislation in Progress, p. 4. Available at: [https://www.europarl.europa.eu/RegData/etudes/BRIE/2024/760442/EPRS_BRI\(2024\)760442_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/BRIE/2024/760442/EPRS_BRI(2024)760442_EN.pdf). Accessed on 16 February 2025.

Figure 32 – The Plastic Pellet Supply Chain is a Global Issue⁹¹⁹

Source: Adaptation of Youngman, A. (2024). Tackling sea-based sources of plastic pollution at the International Maritime Organisation (Environmental Investigation Agency).

In 2024 the IMO adopted recommendations for the carriage of plastic pellets by sea in freight containers⁹²⁰ and, following that, the EU discussed a Proposal for a Regulation on preventing plastic pellet losses to reduce microplastic pollution⁹²¹. The Council of the EU adopted its position on 17 December 2024, extending the regulation to include maritime transport. Specifically, it transforms the IMO's recommendations for transporting plastic pellets by sea into mandatory requirements for shippers, operators, and masters of seafaring vessels departing from or arriving at a Member State's port⁹²².

⁹¹⁹ Youngman, A. (2024). *Ob. cit.*, n.p.

⁹²⁰ IMO (2024e). Recommendations for the Carriage of Plastic Pellets by Sea in Freight Containers (MEPC.1/Circ.909). Available at: <https://wwwcdn.imo.org/localresources/en/MediaCentre/HotTopics/Documents/MEPC.1-Circ.909.pdf>. Accessed on 25 May 2024.

⁹²¹ Council of the European Union (2024a). Proposal for a Regulation of the European Parliament and of the Council on preventing plastic pellet losses to reduce microplastic pollution - General approach. Brussels, 11 December 2024 (OR. en) 16721/24. Interinstitutional File: 2023/0373(COD). Available at: <https://data.consilium.europa.eu/doc/document/ST-16721-2024-INIT/en/pdf>. Accessed on 17 January 2025.

⁹²² European Parliament (2025). *Ob. cit.*, p. 9.

According to the Council, the new EU rules will enhance the management of plastic pellets throughout the entire supply chain, potentially reducing environmental losses of plastic pellets by as much as 74%. This is significant, especially when considering that in 2022, maritime transport was responsible for approximately 38% of all plastic pellets transported within the EU⁹²³ – the region is the most at risk of pellet pollution and a large contributor to global plastic pellet contamination, both domestically and through international trade⁹²⁴.

If on the one hand the Council acknowledges that microplastic pollution is a severe threat, on the other hand it does not fully tackle the extent of plastic pellet spills within the supply chain. This is worrying, especially because the proposal allows exemptions for operators handling less than 5 tonnes of plastic pellets per year⁹²⁵ and there are reduced obligations for those managing under 1.000 tonnes of plastic pellets⁹²⁶ – thus failing to acknowledge the cumulative impact of spills. With 50 million pellets per tonne, even small spills can cause significant environmental harm⁹²⁷, yet smaller operators continue to face insufficient regulation.

In addition, the regulation only mandates internal records of estimated pellet losses, without requiring annual reporting or mandatory spill disclosures unless they are “*significantly affecting human health or the environment*”⁹²⁸. Alarming, maritime spills – a major source of pollution – are completely exempt from reporting. This approach significantly restricts public transparency, regulatory oversight, and access to justice for impacted communities⁹²⁹.

The proposal does not require essential spill-prevention measures such as tear-resistant packaging, secure storage, or standardised containment systems. Instead,

⁹²³ Council of the European Union (2024b). Zero pollution: Council agrees its position on reducing plastic pellet losses, including in maritime transport. Available at: <https://www.consilium.europa.eu/en/press/press-releases/2024/12/17/zero-pollution-council-agrees-its-position-on-reducing-plastic-pellet-losses-including-in-maritime-transport/>. Accessed on 22 December 2024.

⁹²⁴ Fidra (2024). Why plastic pellets must be addressed in the treaty. Environmental charity supporting sustainability and preventing chemical and plastic pollution – Westgate, North Berwick, UK. Available at: https://rethinkplasticalliance.eu/wp-content/uploads/2024/11/Europe_Pellets_Primer_Final_v3.pdf. Accessed on 07 February 2025.

⁹²⁵ Article 1 “Subject matter and scope”, paragraph 2 (a). In: Council of the European Union (2024a). *Ob. cit.*, p. 6.

⁹²⁶ Article 4 “Obligations regarding the handling of plastic pellets”, paragraph 2. In: *Ibid.*, p. 36.

⁹²⁷ Gravier, A.; Haut, G. (2020). Plastic Giants Polluting through the backdoor: the case for a Regulatory Supply-Chain Approach to Pellet Pollution. Rethink Plastic and Surfrider Foundation Europe. Available at: <https://www.surfrider.eu/wp-content/uploads/2020/11/report-pellet-pollution-2020.pdf>. Accessed on 12 January 2025.

⁹²⁸ Article 9 “Incidents and accidents”. In: Council of the European Union (2024a). *Ob. cit.*, p. 47.

⁹²⁹ Youngman, A. (2024). *Ob. cit.*, n.p.

operators are allowed to create their own risk management plans with vague technical standards, leading to significant regulatory gaps⁹³⁰.

The general approach of the Council now advances to trilogues – negotiations between the European Parliament, the Council, and the European Commission⁹³¹. This is a pivotal moment to advocate for stronger, binding measures that emphasise spill prevention, mandatory reporting, and complete transparency⁹³² – while recent technological advancements and policy efforts seek to reduce risks, there is an urgent need for coordinated global action, stronger controls, and increased investment in biodegradable alternatives to protect marine ecosystems and ensure long-term ecological sustainability⁹³³.

Pellet pollution is affecting biodiversity, communities, and industries such as tourism and fishing. Even nations that do not produce or use nurdles are vulnerable to transboundary pollution due to the pellets' movement in the environment and global trade. In this scenario, it is possible to conclude that international trade is a key issue when it comes to combating MPP – as it is fundamental to control what happens to the waste after exports and ensure that it is not mismanaged. The global plastic waste trade benefits from exploiting regulatory loopholes, weak enforcement, and a lack of transparency⁹³⁴.

Developed countries cannot take advantage of the vulnerability of LMICs by avoiding the burden of managing their own waste and exporting not only the plastic itself, but also inequality and insecurity – especially considering that MP deposition rates are higher in LMICs, which means that these populations (and primarily children) are more susceptible to inhaling and ingesting microplastics⁹³⁵.

⁹³⁰ Article 5 “Certification”, paragraph 3. In: Council of the European Union (2024a). *Ob. cit.*, p. 40.

⁹³¹ The general approach agreed upon on 11 December 2024 formalises the Council’s position for negotiations. Discussions with the European Parliament on the final form of the regulation are expected to begin in early 2025. In: Council of the European Union (2024b). *Ob. cit.*, n.p.

⁹³² Rethink Plastic (2024). Regulation on Plastic Pellet pollution: Council of the EU adopts its General Approach. Available at: <https://rethinkplasticalliance.eu/news/regulation-on-plastic-pellet-pollution-the-european-council-adopts-its-general-approach/>. Accessed on 22 December 2024.

⁹³³ Galgani, F.; Rangel-Buitrago, N. (2024). *Ob. cit.*, p. 1.

⁹³⁴ Environmental Investigation Agency (2024). Dirty Deals – Part Two. Evidencing illegalities in the global plastic waste trade, p. 24. Available at: <https://eia-international.org/report/dirty-deals-part-two/>. Accessed on 13 January 2025.

⁹³⁵ Soltani, N.S.; *et. al.* (2022). International quantification of microplastics in indoor dust: prevalence, exposure and risk assessment. **Environmental Pollution**, vol. 312, 119957. DOI: <https://doi.org/10.1016/j.envpol.2022.119957>. Available at: <https://www.sciencedirect.com/science/article/pii/S026974912201171X?via%3Dihub>. Accessed on 18 September 2023.

Although there are restrictions on imports from Asian countries, new export markets continue to emerge⁹³⁶, along with an increase in the illegal trade of plastic waste⁹³⁷. Consequently, there is an urgent need for a future LBI that addresses these problems and strengthen international policies in support of circularity. As it is analysed in depth in Part II of this thesis, the future LBI must include trade rules that dialogue with the WTO and the Basel Convention to prevent plastic waste of being sent to countries without recycling or management capacity⁹³⁸.

Policymakers need adequate knowledge of the problem (including information on the origins of pollution, trends in its distribution and the efficiency of legislative measures), so a multi-stakeholder strategy involving the cooperation of governments, companies and individuals is necessary⁹³⁹. Besides, multi-stakeholders will play an essential role in implementing a life-cycle approach to plastics that considers circularity, providing opportunities for participation in decision-making⁹⁴⁰.

Closing the loop is crucial – and the informal sector plays an essential role in this task⁹⁴¹ –, so the international community must develop a text that truly promotes a fair and inclusive economy that provides a “win-win” socio-ecological scenario, placing waste pickers at the centre of the transition to ending plastic pollution (and reducing the burden of pollution on marginalised and vulnerable individuals and communities)⁹⁴².

⁹³⁶ Marel, E.R.V.D. (2022). Trading Plastic Waste in a Global Economy: Soundly Regulated by the Basel Convention? **Journal of Environmental Law**, vol. 34, n. 3. DOI: <https://doi.org/10.1093/jel/eqac017>. Available at: <https://academic.oup.com/jel/article/34/3/477/6713994>. Accessed on 13 May 2023.

⁹³⁷ Environmental Investigation Agency (2021). *Ob. cit.*, p. 4.

⁹³⁸ UNEP (2022f). Stakeholder dialogue at the first session of the intergovernmental negotiating committee to develop an international legally binding instrument on plastic pollution, including in the marine environment (Synthesis Report). Available at: <https://wedocs.unep.org/bitstream/handle/20.500.11822/41355/StakeholderDialogueSynthesisReport.pdf>. Accessed on 19 May 2023.

⁹³⁹ Seyyedi, S.R.; *et. al.* (2023). *Ob. cit.*, p. 11.

⁹⁴⁰ Jung, D. (2023). An International Legal Framework for Marine Plastics Pollution - Time for a Change to Regulate the Lifecycle of Plastics. In: **The Environmental Rule of Law for Oceans: Designing Legal Solutions**, F. Platjouw & A. Pozdnakova (Eds.), p. 46-57. Cambridge: Cambridge University Press. DOI:10.1017/9781009253741.008. Available at: <https://www.cambridge.org/core/books/environmental-rule-of-law-for-oceans/an-international-legal-framework-for-marine-plastics-pollution/297AD3C347FCBB475F36881EB558AE65>. Accessed on 17 January 2024.

⁹⁴¹ Fadeeva, Z.; Van Berkel, R. (2021). *Ob. cit.*, p. 5.

⁹⁴² O'Hare, P.; *et. al.* (2023). Policy Brief: Towards a Just Transition Away from Plastic Pollution. Zenodo. DOI: <https://doi.org/10.5281/zenodo.10021005>. Available at: https://pure.manchester.ac.uk/ws/portalfiles/portal/279651360/SCEPT_Policy_Brief_Just_Transition_en.pdf. Accessed on 13 January 2024.

2.2.2 Marine Plastic Pollution and the Rule of Law: Shaping Legal Perspectives

The growing crisis of MPP undeniably presents a multifaceted challenge to global environmental governance. As the issue intensifies, legal frameworks – both domestic and international – are being scrutinised and tested to address the various dimensions of this pollution.

Despite those efforts to implement CE approaches, addressing PWM and regulating the international trade of plastic waste, the lack of a cohesive global framework has allowed for the continued movement of waste across borders.

This not only exacerbates environmental harm but also negatively impacts communities and public health. Considering this, one question arises: who is accountable for the widespread pollution caused by unbridled plastic production and consumption?

As MPP spirals out of control, the need for clear state responsibility and effective legal actions against the industry has become more pressing. The absence of a global LBI on plastic pollution, however, leaves a legal void, perpetuating an uncontrolled state where accountability remains unclear, and enforcement mechanisms are weak.

In this section, hence, we delve into the complex relationship between responsibility, liability, and accountability in the context of MPP, exploring the intersection of state responsibility and corporate accountability.

Subsection A “2.2.2.1” explores the due diligence obligations of states to regulate private entities within their jurisdiction and the potential for shared state responsibility in transboundary pollution scenarios. Key challenges, such as establishing causality and applying international legal principles are addressed, with particular attention to the gaps in the current regime that may hinder effective remediation.

Subsection B “2.2.2.2” shifts focus to the growing body of case law that is helping shape how accountability for MPP is navigated within the judicial system. With major corporations under scrutiny for their role in plastic pollution, landmark lawsuits have illustrated how litigation is increasingly being utilised to hold industry giants accountable for the environmental harm caused by plastic waste.

Data suggests that potential litigation related to plastic pollution could result in corporate liabilities exceeding USD 20 billion in just one country between 2022 and 2030⁹⁴³. These lawsuits highlight the ongoing tension between the profits reaped by the

⁹⁴³ This is estimated considering the case of the USA alone, which is expected to be the primary hub for claims, where projected maximum potential liabilities (with a 1% probability) could surpass USD 100

plastic industry and the costs shouldered by society, particularly the most vulnerable groups.⁹⁴⁴ This dynamic unfolds within the broader context of the universally acknowledged human right to a clean, healthy, and sustainable environment⁹⁴⁵.

These cases demonstrate the evolving role of the judiciary in addressing corporate responsibility and raise pertinent questions regarding the legal mechanisms needed to address the broader environmental crisis of plastic pollution. Through these claims, we examine the potential of litigation as a tool to enforce both corporate accountability and the obligations of states to protect and preserve the marine environment.

billion. In: Merkl, A.; Charles, D. (2022). **The Price of Plastic Pollution: Social Costs and Corporate Liabilities.** Minderoo Foundation, p. 11. Available at: <https://cdn.minderoo.org/content/uploads/2022/10/14130457/The-Price-of-Plastic-Pollution.pdf>. Accessed on 13 December 2023.

⁹⁴⁴ UNEP (2023e). *Ob. cit.*, p. xv.

⁹⁴⁵ As it was recognised in the UNGA Resolution 76/300 of 28 July 2022. In: UNGA (2022). *Ob. cit.*, n.p.

2.2.2.1 Accountability for Land-based Marine Plastic Pollution: Navigating between Responsibility and Liability?

Marine plastic pollution could be linked to multiple states, leading to shared state responsibility⁹⁴⁶. Under Article 192 UNCLOS “*States have the obligation to protect and preserve the marine environment*”⁹⁴⁷. It is widely accepted that Article 192 embodies customary international law⁹⁴⁸.

In fact, the obligation to protect and preserve the marine environment can be viewed as an obligation *erga omnes*. As a result, MPP may raise the question of state responsibility for violating this *erga omnes* obligation related to the protection of the marine environment⁹⁴⁹.

To hold a state responsible, its conduct – whether an act or an omission – must be attributable to the state under international law and must constitute a breach of its international obligations⁹⁵⁰. Damage, however, is not a necessary element to establish an internationally wrongful act by the state⁹⁵¹.

While the actions of private individuals are not directly attributable to one state, it can be held responsible for the conduct of private parties if it fails to take the necessary steps to prevent such harmful actions – *i.e.*, if a state neglects its duty to exercise due

⁹⁴⁶ Tanaka, Y. (2023). Shared State Responsibility for Land-Based Marine Plastic Pollution. **Transnational Environmental Law**, vol. 12, n. 2, p. 244. DOI: doi:10.1017/S2047102522000462. Available at: <https://www.cambridge.org/core/services/aop-cambridge-core/content/view/566C1933C7666C52DB045085BB51622D/S2047102522000462a.pdf/shared-state-responsibility-for-land-based-marine-plastic-pollution.pdf>. Accessed on 22 June 2023.

⁹⁴⁷ UN (1982a). *Ob. cit.*, n.p.

⁹⁴⁸ Proelß, A. (2017). *Ob. cit.*, p. 1283-1284.

⁹⁴⁹ Article 192 holds a moral and fundamental significance, which is why it is widely regarded as having an *erga omnes* quality. *Erga omnes* obligations refer to a State's duties toward the international community as a whole, which, by their very nature, concern all States, and in fulfilling them, all States have a legal interest. As such, provisions with an *erga omnes* character can typically be enforced by the international community. Both *erga omnes* obligations and *opinio juris* require a discernible interest (such as a common concern or shared areas) from the community of States in each specific case. Multilateral treaties and customary international law, particularly those related to global environmental protection or areas of common interest, establish obligations with the international community as their intended beneficiaries. In: *Ibid*, p. 1285.

⁹⁵⁰ Crawford, J. (2002). The International Law Commission's Articles on State Responsibility – Introduction, Text and Commentaries. Edinburgh: Cambridge University Press, p. 81. Available at: <https://assets.cambridge.org/97805218/13532/sample/9780521813532ws.pdf>. Accessed on 18 September 2023.

⁹⁵¹ Tanaka, Y. (2023). *Ob. cit.*, p. 245.

diligence in preventing harmful private conduct, it may bear responsibility⁹⁵² for that failure⁹⁵³.

Specifically in the realm of environmental protection, a state has a due diligence obligation to regulate and control private activities within its borders to prevent transboundary pollution⁹⁵⁴. Should a state fail to exercise due diligence in preventing transboundary pollution caused by private activities, state responsibility may arise⁹⁵⁵.

This obligation is crucial in the context of plastic pollution, given that private entities are the primary contributors to plastic production and discharge⁹⁵⁶. Although no state is likely to be individually harmed by MPP, at least in theory, this should not hinder the application of state responsibility law⁹⁵⁷.

As plastic waste is discharged from the territories of multiple states, the problem of MPP has a shared origin across these states. This raises the issue of shared state responsibility⁹⁵⁸ – given the *erga omnes* nature of the obligation to protect and preserve the marine environment, it can be argued that all states (including those not directly

⁹⁵² Concerning this subject, it is important to distinguish between responsibility and liability. For further discussion, see note 148 *supra*. While liability could be attributed to states, it could also be imposed on corporations that produce plastics, entities that distribute it to consumers, the consumers themselves, or even those who dispose of plastic waste into the environment. Each of these approaches would carry distinct justice implications in a globalised economy, where plastic may be produced in one country, consumed in another, and discarded into the environment in a third. In: Maljean-Dubois, S.; Mayer, B. (2020). Liability and Compensation for Marine Plastic Pollution: Conceptual Issues and Possible Ways Forward. **AJIL Unbound**, vol. 114, p. 207. DOI:10.1017/aju.2020.40. Available at: <https://www.cambridge.org/core/journals/american-journal-of-international-law/article/liability-and-compensation-for-marine-plastic-pollution-conceptual-issues-and-possible-ways-forward/A84CB7AEBAC4E98E2DE98C3E1144A3F3>. Accessed on 17 May 2023.

⁹⁵³ Tanaka, Y. (2023). *Ob. cit.*, p. 246.

⁹⁵⁴ This obligation of due diligence is a fundamental element of customary international environmental law. In: Laganière, G. (2022). *Ob. cit.*, p. 24.

⁹⁵⁵ Koivurova, T. (2013). Due Diligence. In: R. Wolfrum (ed.), *Max Planck Encyclopedias of International Law*, Oxford University Press, p. 4. Available at: <https://www.arcticcentre.org/loader.aspx?id=78182718-d0c9-4833-97b3-b69299e2f127>. Accessed on 12 June 2023.

⁹⁵⁶ The actions of private persons cannot be directly attributed to the State. However, if a State fails to take appropriate measures to prevent or punish the individual's act, meaning it neglects to exercise due diligence, it is considered to have engaged in wrongful conduct, thereby triggering State responsibility. It does not mean that there is no possibility of attributing responsibility for transboundary harm caused by marine plastic pollution to a State agent, but it is much more probable that a State would be held accountable for failing to exercise due diligence in regulating the actions of private actors. Private individuals and entities are typically the ones responsible for producing, consuming, and disposing of plastics. In: Finska, L. (2021). *Confronting the Global Plastics Problem Threatening the Marine Environment: a Framework and Elements of an International Legal Response*. Doctoral dissertation, Faculty of Law, UiT The Arctic University of Norway, p. 158-159. Available at: <https://munin.uit.no/handle/10037/23741>. Accessed on 15 May 2023.

⁹⁵⁷ Maljean-Dubois, S.; Mayer, B. (2020). *Ob. cit.*, p. 208.

⁹⁵⁸ Nollkaemper, A. (2014). Introduction. In: **Principles of Shared Responsibility in International Law: An Appraisal of the State of the Art**. Nollkaemper, A.; Plakokefalos, I. (eds). Cambridge University Press, p. 6-7. DOI: <https://doi.org/10.1017/CBO9781139940009.002>. Available at: <https://www.cambridge.org/core/books/abs/principles-of-shared-responsibility-in-international-law/introduction/FFA9535BDA5EE4E726239DB48196E832>. Accessed on 18 May 2023.

affected by damage) have the right to invoke shared state responsibility for land-based MPP⁹⁵⁹.

In practice, nevertheless, states who might seek to invoke shared state responsibility for land-based MPP would face significant challenges – beyond proofing that the plastics were introduced into the marine environment through activities under the jurisdiction or control of the state deemed responsible⁹⁶⁰. Two in particular are worth highlighting.

The first pertains to establishing a causal link between environmental damage and wrongful conduct. Even if the affected State can demonstrate harm and prove that it is serious or substantial, the question of causality still remains⁹⁶¹. This is because the sources of pollution are spread across multiple states, therefore proving causation becomes more complex compared to bilateral environmental pollution cases⁹⁶².

When considering the widespread dispersal of microplastics or nanoplastics across the ocean it becomes even more intricate⁹⁶³. Marine debris primarily consist of fragmented pieces, many of which have lost their original characteristics, such as colour, shape, or any inscriptions. Establishing their origin is a challenging task⁹⁶⁴.

Besides, due to ocean currents, plastics can travel long distances from their initial point of release into the seas. To establish causality between the affected State and the State of origin, it would be necessary to identify and trace these movement patterns with enough certainty to link the sources of plastics to the resulting transboundary harm⁹⁶⁵. MPP from land-based sources, as a result, typically is not directly linked to the actions or inactions of any individual state or operator⁹⁶⁶.

⁹⁵⁹ Tanaka, Y. (2023). *Ob. cit.*, p. 260.

⁹⁶⁰ Schäli, J. (2022). *Ob. cit.*, p. 220.

⁹⁶¹ Finska, L. (2021). *Ob. cit.*, p. 164.

⁹⁶² While there are indications that the majority of marine-based plastic originates from a small group of countries, all States contribute to plastic pollution somehow, making it exceedingly challenging to establish a direct causal link between a specific harm and plastic pollution from any State. This complexity makes it difficult to hold a single State accountable under the laws of State responsibility. In: Kirk, E.A.; Popattanachai, N. (2018). Marine plastics: Fragmentation, effectiveness and legitimacy in international lawmaking. **RECIEL**, vol. 27, n. 3 p. 223-224. DOI: <https://doi.org/10.1111/reel.12261>. Available at: <https://onlinelibrary.wiley.com/doi/abs/10.1111/reel.12261>. Accessed on 13 May 2023.

⁹⁶³ Marcharla, E.; *et al.* (2024). Microplastics in marine ecosystems: A comprehensive review of biological and ecological implications and its mitigation approach using nanotechnology for the sustainable environment. **Environmental Research**, vol. 256, p. 5. DOI: <https://doi.org/10.1016/j.envres.2024.119181>. Available at: <https://www.sciencedirect.com/science/article/pii/S0013935124010867>. Accessed on 12 January 2025.

⁹⁶⁴ Schäli, J. (2022). *Ob. cit.*, p. 216.

⁹⁶⁵ Finska, L. (2021). *Ob. cit.*, p. 165.

⁹⁶⁶ Schäli, J. (2022). *Ob. cit.*, p. 216.

The second challenge involves the application of the “*Monetary Gold*” rule⁹⁶⁷, which requires a court or tribunal to refrain from exercising jurisdiction when the legal interests – of a third State – would not only be affected by a decision but would form the very subject-matter of the decision. This means that international courts lack the authority to resolve disputes between states unless those states consent to the court’s jurisdiction over the matter. If the outcome of the case affects the interests of a third party not involved in the dispute and that third party does not agree to the court’s jurisdiction, the court must refrain from exercising its jurisdiction – even if the disputing states consent to it⁹⁶⁸.

In this sense, the application of the *Monetary Gold* rule could effectively prevent a determination of shared state responsibility. A broader interpretation of the rule would unjustifiably limit the practical capacity of courts and tribunals to fulfil their functions⁹⁶⁹. To reduce the legal impact of the *Monetary Gold* rule in cases involving shared state responsibility, it would be necessary to interpret this concept in a narrow and restrictive manner⁹⁷⁰.

In summary, it may be challenging, if not impossible, for an international court or tribunal to determine whether the *erga omnes partes* obligations⁹⁷¹ concerning the protection of the marine environment⁹⁷² have been breached, especially if multiple states are involved in the alleged breach⁹⁷³. Land-based sources of MPP, such as laundry and

⁹⁶⁷ In *The Case of the Monetary Gold Removed from Rome in 1943*, the ICJ ruled that it cannot resolve a dispute if the legal interests of a third party “would form the very subject-matter of the decision”. In: ICJ (1954). *Affaire de L’Or Monétaire Pris a Rome en 1943 (Question Préliminaire) (Italie C. France, Royaume-Uni De Grande-Bretagne et D’Irlande Du Nord Et Etats-Unis D’Amérique)*. Judgment of 15 June 1954, Preliminary question, Procedure(s): Preliminary objections, Questions of jurisdiction and/or admissibility, p. 17. Available at: <https://www.icj-cij.org/sites/default/files/case-related/19/019-19540615-JUD-01-00-EN.pdf>. Accessed on 16 July 2023. See also Paragraph 640 of Award in the South China Sea Arbitration. In: PCA (2016). *Ob. cit.*, p. 258.

⁹⁶⁸ Mollengarden, Z.; Zamir, N. (2021). The Monetary Gold Principle: Back to Basics. **American Journal of International Law**, vol. 115, n. 1, p. 41. DOI:10.1017/ajil.2020.86. Available at: <https://www.cambridge.org/core/services/aop-cambridge-core/content/view/B6691623A0AADEA48A8AD621B17B9987/S000293002000086Xa.pdf/the-monetary-gold-principle-back-to-basics.pdf>. Accessed on 17 June 2023.

⁹⁶⁹ Nollkaemper, A. (2014). *Ob. cit.*, p. 68.

⁹⁷⁰ Tanaka, Y. (2023). *Ob. cit.*, p. 262.

⁹⁷¹ The no-harm principle mandates that states act with due diligence and cooperate, both of which are obligations of conduct. This is a fundamental principle in international environmental law. According to the ICJ “the general obligation of States to ensure that activities within their jurisdiction and control respect the environment of other States or of areas beyond national control is now part of the corpus of international law relating to the environment”. This principle, thus, is widely acknowledged as an integral component of customary international law. In: ICJ (1996). *Legality of the Threat or Use of Nuclear Weapons*. Advisory Opinion, 8 July 1996, ICJ Reports, p. 242, paragraph 29. Available at: <https://www.icj-cij.org/sites/default/files/case-related/95/095-19960708-ADV-01-00-EN.pdf>. Accessed on 11 May 2023.

⁹⁷² International cooperation is essential to implement these *erga omnes* obligations, and it is argued that the duty to cooperate is an inherent part of the *erga omnes* obligation to preserve and protect the marine environment. The obligation *erga omnes* and shared state responsibility, consequently, are interconnected through the duty to cooperate in safeguarding the marine environment. In: Finska, L. (2021). *Ob. cit.*, p. 173.

⁹⁷³ Kirk, E.A.; Popattanachai, N. (2018). *Ob. cit.*, p. 223-224.

tire wear, are widespread and dispersed, and almost all countries contribute to MPP continuously and progressively – albeit to different extents. Therefore, it could even be argued that the entire international community shares responsibility for addressing this issue⁹⁷⁴.

Furthermore, there is no *lex specialis*⁹⁷⁵ addressing shared state responsibility specifically in the context of land-based MPP. As a result, shared state responsibility for this sort of pollution must be governed by the general principles of state responsibility in international law⁹⁷⁶.

It also worth reflecting about what can realistically be remedied when it comes to MPP. Cleaning up micro- or nanoplastics is virtually impossible due to their small size and invisibility in the marine environment⁹⁷⁷ and, cleaning up sunken plastics over wide areas is also not practical, as it would require costly submarine equipment for deep waters or the manual labour of divers in shallower depths⁹⁷⁸.

Alternatively, in the cases involving an injured State, potential remedies could also include restitution and compensation. Yet, even when MPP results in adverse effects, defining and assessing ecological harm remains complex and controversial⁹⁷⁹.

Beyond the challenges already highlighted, there remains the critical question of how to reconstruct any responsibility or liability⁹⁸⁰ mechanism to better face the challenges of damage resulting from cumulative pollution, such as MPP. Facing these obstacles will most likely require abandoning the need to make a direct causal link between the polluter and resulting damage, rethinking the currently required threshold of significant damage, and developing harmonised methodologies to measure and assess damage from cumulative pollution⁹⁸¹.

⁹⁷⁴ Schäli, J. (2022). *Ob. cit.*, p. 216-217.

⁹⁷⁵ Or a law regulating a particular area of concern.

⁹⁷⁶ Tanaka, Y. (2023). *Ob. cit.*, p. 269.

⁹⁷⁷ Lee, Y.; *et. al.* (2023). Health Effects of Microplastic Exposures: Current Issues and Perspectives in South Korea. *Yonsei Medical Journal*, vol. 64, n. 5, p. 301-308. DOI: 10.3349/ymj.2023.0048. Available at: <https://pmc.ncbi.nlm.nih.gov/articles/PMC10151227/>. Accessed on 18 May 2023.

⁹⁷⁸ Finska, L. (2021). *Ob. cit.*, p. 169.

⁹⁷⁹ Defining and assessing purely ecological harm is complex and remains a contentious issue. In international law, there is the added difficulty of determining which entity, if any, would have the right to seek redress for harm to common spaces, or the areas beyond national jurisdiction. In: Fitzmaurice, M. (2008). *International Responsibility and Liability*. In: *Oxford Handbook of International Environmental Law*. Daniel Bodansky (ed.) *et. al.*, p. 1015. DOI: <https://doi.org/10.1093/oxfordhb/9780199552153.013.0044>. Available at: <https://academic.oup.com/edited-volume/42625/chapter-abstract/358048098?redirectedFrom=fulltext&login=true#no-access-message#no-access-message>. Accessed on 18 May 2023.

⁹⁸⁰ Similar to state responsibility, causality also presents a challenge when it comes to liability.

⁹⁸¹ Finska, L. (2021). *Ob. cit.*, p. 183.

Thus, determining whether the widespread accumulation of plastics in the marine environment constitutes a breach of obligations under Part XII of UNCLOS cannot be answered universally and is contingent on the specifics of each case.

There are many obstacles in this context, such as: i) identifying a single state to which the pollution can be attributed; ii) establishing a causal link between the sources and their effects, particularly in relation to diffuse sources and cumulative impacts; iii) determining the standard of care required for mitigating MPP in the absence of binding international standards; and iv) assessing the environmental, social, and economic damages linked to MPP⁹⁸².

Overall, State responsibility remains a somewhat inadequate means of securing reparation for transboundary pollution⁹⁸³ – in fact, to date, no state has perpetrated a claim against another for transboundary plastic pollution in marine environments⁹⁸⁴ – unless customary international environmental law becomes more refined, and the regime is more frequently invoked through litigation⁹⁸⁵. In this regard, the recent rise of climate litigation could serve as an inspiration for “plastic litigation”⁹⁸⁶, as it is analysed subsequently.

Given the worldwide extent of (marine) plastic pollution and the numerous threats it presents, also having in mind that liability is not a concept limited to states⁹⁸⁷, the role of plastic litigation could be crucial in addressing this crisis – as there are many ways in which courts can address legal issues related to plastic pollution.

⁹⁸² Schäli, J. (2022). *Ob. cit.*, p. 219.

⁹⁸³ In the case of MPP, it should also be considered that it can only fall under the responsibility regime once it has reached a point of “cumulative” wrongdoing. However, historically, neither environmental obligations related to pollution, nor the law of state responsibility were designed to address cumulative pollution. As a result, the obligations are not framed in terms of a series of acts or omissions defined collectively as wrongful.

⁹⁸⁴ There are several challenges tied to state responsibility claims, whether concerning the burden of proof or political reciprocity in interstate relations. As a result, when it comes to laws governing specific aspects of marine pollution, states often rely on specialised liability regimes. These regimes typically focus on the polluter, including private operators, offering a valuable alternative to state responsibility claims. In: Schäli, J. (2022). *Ob. cit.*, p. 220-222.

⁹⁸⁵ Laganière, G. (2022). *Ob. cit.*, p. 27-28.

⁹⁸⁶ Maljean-Dubois, S.; Mayer, B. (2020). *Ob. cit.*, p. 210.

⁹⁸⁷ Within the scope of civil liability, other entities, including private operators, can also be held accountable for the harm they cause. In: Schäli, J. (2022). *Ob. cit.*, p. 214.

2.2.2.2 “Plastic Litigation” Review: an Emerging Legal Landscape

Many ordinary activities, whether industrial, commercial, or otherwise, inherently carry a risk of causing harm. Liability addresses the issue of compensation, even for damage resulting from lawful activities⁹⁸⁸.

These activities are often not attributable to the state – and states are typically reluctant to assume liability for damage caused by them. On one hand, state compensation for harm caused by hazardous activities could shift the financial burden of these risks onto the state⁹⁸⁹.

This might be seen as an improper subsidisation of dangerous activities, potentially encouraging operators to take on higher risks while exploiting gaps in (inter)national regulations – a scenario that contradicts the “polluter pays” principle⁹⁹⁰ and undermines the goals of environmental law. On the other hand, there is no justifiable reason why the victims of such damage, or the state in which they reside, should bear the loss. In either case, neither option aligns with the “polluter pays” principle⁹⁹¹.

In this context, plastic pollution – in both its visible and more harmful, invisible forms, including nanoplastics and the toxic chemical additives they carry – is costing society hundreds of billions of dollars annually. These costs stem from medical treatment, environmental cleanups, and significant damages to the natural world. This financial burden is comparable to the revenue generated by the entire plastics industry itself⁹⁹².

Considering the already explored fragmentation of international law, no jurisdiction – whether local, national, or supranational – would effectively be able to tackle plastic pollution in its entirety. Amidst the array of existing measures, several regulatory approaches have developed to address different facets of plastic pollution⁹⁹³.

⁹⁸⁸ Laganière, G. (2022). *Ob. cit.*, p. 28.

⁹⁸⁹ Schäli, J. (2022). *Ob. cit.*, p. 224-225.

⁹⁹⁰ According to the Principle 16 of the 1992 Rio Declaration, which provides that “National authorities should endeavour to promote the internalization of environmental costs and the use of economic instruments, taking into account the approach that the polluter should, in principle, bear the cost of pollution, with due regard to the public interest and without distorting international trade and investment.” In: UNGA (1992). *Ob. cit.*, p. 3.

⁹⁹¹ Schäli, J. (2022). *Ob. cit.*, p. 224-225.

⁹⁹² Merkl, A.; Charles, D. (2022). *Ob. cit.*, p. 6.

⁹⁹³ As previously analysed, most of these regulations refer to the: i) regulation of the transportation and/or disposal of plastic waste (waste management approach); ii) regulation of specific plastic products (product-focused regulation approach); or iii) regulation of the chemical substances used in the production of plastic products (substance-based regulation approach). In: Varvastian, S. (2023). The Role of Courts in Plastic Pollution Governance. **International & Comparative Law Quarterly**, vol. 72, n. 3, p. 14. DOI: 10.1017/S0020589323000179. Available at: <https://www.cambridge.org/core/services/aop-cambridge-core/content/view/9738157DDF3BE8304DD8FE7BBC8F56FE/S0020589323000179a.pdf/the-role-of-courts-in-plastic-pollution-governance.pdf>. Accessed on 19 December 2023.

The increasing concern over plastic pollution, coupled with the sparse regulatory measures addressing it, has led to “plastic litigation”. It arises in parallel and similarly to “climate litigation” – but the latter has existed since the 1990s, as the first wave of litigation cases occurred in the USA and in Australia, with the main objective to raise environmental standards⁹⁹⁴.

Climate litigation, in fact, emerged to press legislators and policymakers for more ambitious and comprehensive actions, and to fill gaps resulting from legislative and regulatory inaction⁹⁹⁵. Where (and when) international climate change law has been avoided and domestic climate change legislation has stalled, there is a greater likelihood that courts will adjudicate failure at the request of litigants⁹⁹⁶.

The most part of the climate change litigation cases can be divided into four types. As Figure 33 illustrates in the “concentric circles” representation.

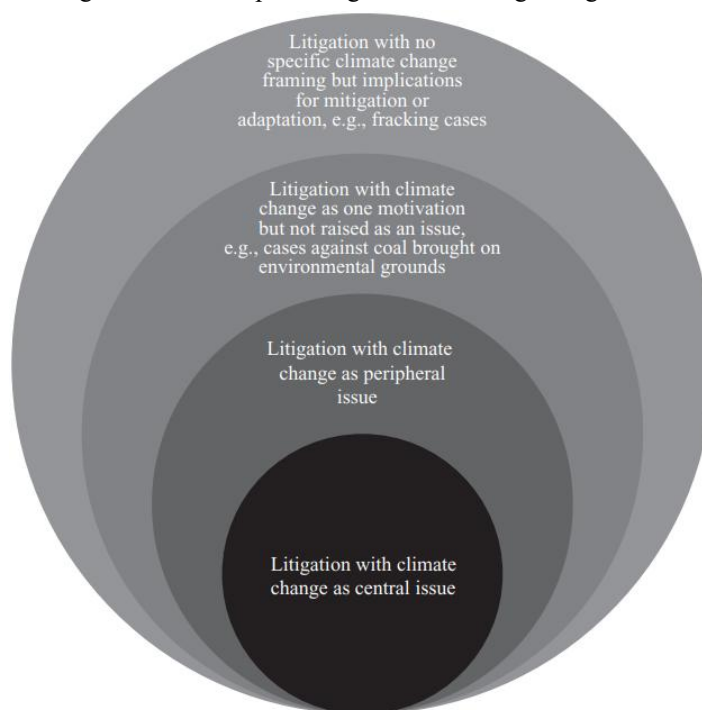
At the centre there are cases where climate change – whether in terms of mitigation or adaptation and brought by pro- or anti-regulatory claimants – is the central issue of the case. At the outer edges of climate change litigation are cases that are not directly linked to specific climate change arguments but still have significant implications for climate change mitigation or adaptation. In the middle there are cases where: i) climate change is mentioned, but as a secondary issue in the case (peripheral); and ii) concerns about climate change partly motivate the lawsuit, even if they are not explicitly addressed in the claims or ruling⁹⁹⁷.

⁹⁹⁴ The Geneva Association (2021). *Climate Change Litigation – Insights into the evolving global landscape*. Authors: Maryam Golnaraghi, Joana Setzer, Nigel Brooke, Wynne Lawrence and Lucia Williams, 44p. Available at: <https://www.genevaassociation.org/research-topics/climate-change-and-emerging-environmental-topics/climate-litigation>. Accessed on 13 December 2024.

⁹⁹⁵ Burger, M.; Gundlach, J. (2017). **The status of climate change litigation**: a global review. 1st Edition. Nairobi: Sabin Center for Climate Change Law and United Nations Environment Programme, 41 p. ISBN 978-92-807-3656-4. Available at: https://scholarship.law.columbia.edu/cgi/viewcontent.cgi?article=1097&context=sabin_climate_change. Accessed on 19 December 2024.

⁹⁹⁶ Vanhala, L.; Hilson, C. (2013). Climate Change Litigation: Symposium Introduction. **Law & Policy** (University of Denver), vol. 35, n. 3, p. 141-149. DOI <https://doi-org.ez11.periodicos.capes.gov.br/10.1111/lapo.12007>. Available at: <https://onlinelibrary.wiley.com/doi/10.1111/lapo.12007>. Accessed on 22 December 2024.

⁹⁹⁷ Peel, J.; Osofsky, H.M. (2015). **Climate Change Litigation**: Regulatory Pathways to Cleaner Energy. Cambridge: Cambridge University Press. ISBN 978-1-107-03606-2.

Figure 33 – Conceptualising Climate Change Litigation⁹⁹⁸

Source: Peel, J.; Osofsky, H.M. (2015). **Climate Change Litigation: Regulatory Pathways to Cleaner Energy**.

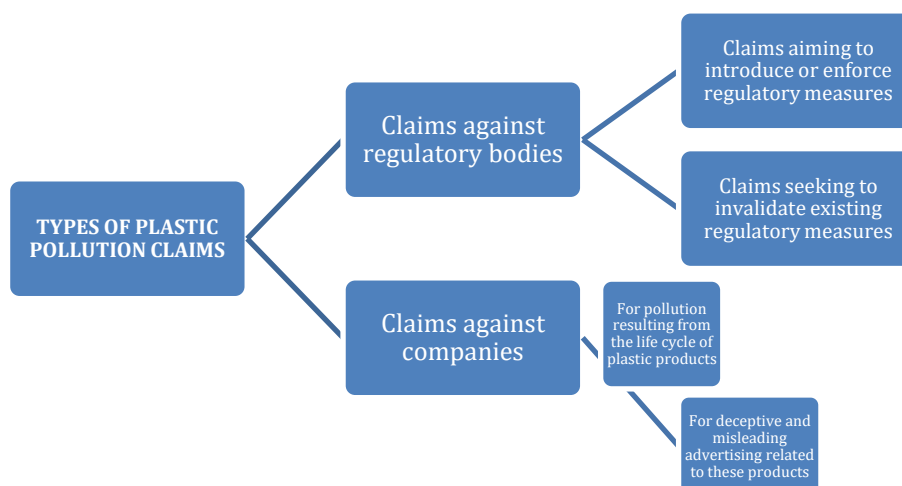
Similarly, when it comes to plastic litigation, so far it has been identified that the claims can be classified into two main types: i) claims against regulatory bodies; and ii) claims against companies. The two primary categories of claims against regulatory bodies are: i.i) claims aiming to introduce or enforce regulatory measures (pro-regulatory claims); and i.ii) claims seeking to invalidate existing regulatory measures (anti-regulatory claims). On the other hand, claims against companies generally focus on pollution resulting from the life cycle of plastic products or on deceptive and misleading advertising related to these products⁹⁹⁹.

Figure 34 represents this structural organisation:

⁹⁹⁸ Peel, J.; Osofsky, H.M. (2015). *Ob. cit.*, p. 8.

⁹⁹⁹ Varvastian, S. (2023). *Ob. cit.*, p. 648.

Figure 34 – Types of Plastic Pollution Claims



Source: Author's elaboration.

Considering the plastic litigation cases perpetrated in the USA, it is possible to identify more specific categories, which are summarised in Table 4:

Table 4 – Description of Categories¹⁰⁰⁰

Category	Description
State Codes	Cases involving application of state codes, e.g. cases involving the California Plumbing Code which contains state plumbing design and construction standards.
Clean Water Act	Cases involving the Clean Water Act, which controls water pollution and regulates discharges of pollutants into USA waters.
Consumer Protection	Cases involving consumer protection as a subject of state and local law.
Environmental Protection	Cases involving environmental protection as a subject of state and local law.
False Advertising	Cases involving false advertising as a subject of state and local law.
Securities	Cases involving a federal securities class action based upon violations of USA federal securities law.
Greenwashing	Cases involving greenwashing, the process of conveying a false impression or providing misleading information about how a company's products are more environmentally sound.
National Environmental Policy Act	Cases involving the National Environmental Policy Act, which requires federal agencies to assess the environmental effects of proposed major federal actions prior to making decisions.

¹⁰⁰⁰ This table is an adaptation of The Guarini Center; State Impact Center (2022). Plastics Litigation Tracker – Description of Categories. Available at: <https://stateimpactcenter.org/files/Description-of-Categories.pdf>. Accessed on 11 December 2024.

Plastic Bans	Cases involving banning the use of plastic bags, plastic containers, or expanded polystyrene (Styrofoam) containers under state or local law.
Tax	Cases involving the imposition of a tax on the use of plastic containers under state or local law.
Public Nuisance	Cases involving public nuisance as a subject of state and local law.
Resource Conservation and Recovery Act	Cases involving the Resource Conservation and Recovery Act (RCRA), a federal law which governs the disposal of solid waste and hazardous waste.
Unfair Competition	Cases involving unfair competition as a subject of state and local law.

With legislative efforts on plastic pollution stalling, advocates are turning to the judiciary to hold polluters accountable. Similar to climate change litigation, plastic pollution lawsuits are novel, with a diverse range of defendants. Some cases rely on established laws, while others present new legal arguments – like applying public nuisance claims to bottle manufacturers¹⁰⁰¹.

The defendants – including plastic producers, pellet transporters, government agencies, and major bottling companies – reflect the variety of claims made. However, unlike climate change litigation, the outcomes thus far have leaned slightly in favour of plaintiff-advocates¹⁰⁰².

The increasing volume of court cases globally necessitates a thorough examination of their impact on shaping the regulatory response to plastic pollution. As key institutional actors, the judiciary has been instrumental in safeguarding the environment and human health, with litigation frequently highlighting deficiencies in regulatory frameworks or their unintended outcomes¹⁰⁰³.

As the industry has failed to effectively prevent plastic from entering the environment, advocates are resorting to litigation to hold various defendants responsible for the damages caused by plastic¹⁰⁰⁴.

Courts, therefore, are playing a crucial role in outlining the extent of human rights obligations regarding environmental protection, clarifying the powers of regulatory

¹⁰⁰¹ The nature of plastics litigation is expected to vary across countries. In the USA, where a well-funded plaintiff bar is bolstered by an active third-party litigation funding market, damage claims are the primary form of legal redress. In Europe, public interest litigation is often led by non-profit consumer associations and NGOs, with a focus more on changing behaviours than seeking compensation. In England and Australia, both trends are present, as third-party litigation funders and NGOs play an equally active role in driving environmental litigation. In: Merkl, A.; Charles, D. (2022). *Ob. cit.*, p. 32.

¹⁰⁰² Advocates have achieved significant settlements, successfully moved claims forward against polluters, and led to the suspension of permits. These tangible outcomes indicate that plastic pollution litigation, still in its early stages, could serve as a promising approach to tackling the plastic crisis. In: Morath, S.J.; *et. al.* (2021). Plastic Pollution Litigation. **Natural Resources & Environment**, vol. 36, n. 1, p. 41-44. Available at: <https://www.jstor.org/stable/27242800>. Accessed on 17 December 2024.

¹⁰⁰³ Varvastian, S. (2023). *Ob. cit.*, p. 636.

¹⁰⁰⁴ Morath, S.J.; *et. al.* (2021). *Ob. cit.*, p. 41-42.

bodies to address pollution, enabling victims of hard-to-trace environmental and health damages to seek compensation, and urging governments to implement stricter environmental protection standards¹⁰⁰⁵.

This judicial role was further reinforced on 23 July 2025, when the International Court of Justice (ICJ) issued its long-anticipated Advisory Opinion on *The Obligations of States in Respect of Climate Change*. The request for this opinion was submitted by the UNGA, which sought clarification on two key issues: a) *what are the obligations of States under international law to ensure the protection of the climate system and other parts of the environment from anthropogenic emissions of greenhouse gases for States and for present and future generations?*; and b) *what are the legal consequences under these obligations for States where they, by their acts and omissions, have caused significant harm to the climate system and other parts of the environment?*¹⁰⁰⁶

The ICJ concluded that the right to a clean and healthy environment is an integral part of international human rights law, as

(...) a clean, healthy and sustainable environment is a precondition for the enjoyment of many human rights, such as the right to life, the right to health and the right to an adequate standard of living, including access to water, food and housing. The right to a clean, healthy and sustainable environment results from the interdependence between human rights and the protection of the environment. Consequently, in so far as States parties to human rights treaties are required to guarantee the effective enjoyment of such rights, it is difficult to see how these obligations can be fulfilled without at the same time ensuring the protection of the right to a clean, healthy and sustainable environment as a human right. The human right to a clean, healthy and sustainable environment is therefore inherent in the enjoyment of other human rights. The Court thus concludes that, under international law, the human right to a clean, healthy and sustainable environment is essential for the enjoyment of other human rights¹⁰⁰⁷.
(author's emphasis)

This recognition is particularly notable given that some States have historically been reluctant to recognise it as a distinct right. With this acknowledgment, actions that damage ecosystems can now be directly challenged – not only because a healthy

¹⁰⁰⁵ Varvastian, S. (2023). *Ob. cit.*, p. 636.

¹⁰⁰⁶ On 29 March 2023 the UNGA decided, in accordance with Article 96 of the Charter of the United Nations, to request the International Court of Justice, pursuant to Article 65 of the Statute of the Court, to render an advisory opinion on this matter. In: ICJ (2023). REQUEST FOR ADVISORY OPINION transmitted to the Court pursuant to General Assembly resolution 77/276 of 29 March 2023 OBLIGATIONS OF STATES IN RESPECT OF CLIMATE CHANGE. Available at: <https://www.icj-cij.org/sites/default/files/case-related/187/187-20230412-app-01-00-en.pdf>. Accessed on 07 August 2025.

¹⁰⁰⁷ ICJ (2025). OBLIGATIONS OF STATES IN RESPECT OF CLIMATE CHANGE. Advisory Opinion, 23 July 2025, p. 113. Available at: <https://www.icj-cij.org/sites/default/files/case-related/187/187-20250723-adv-01-00-en.pdf>. Accessed on 17 August 2025.

environment underpins other human rights, but because the right to a clean and healthy environment itself is a legally recognised human right.

Building on this expanding framework of responsibility, an emerging area of legal development concerns the liability of major corporations that contribute significantly to plastic pollution. For example, very recent and high-profile cases such as *People v. PepsiCo, Inc., et. al.* and *Rodriguez, et al. v. Exxon Mobil Corporation, et. al.*¹⁰⁰⁸ exemplify how legal mechanisms are being used to hold companies liable or accountable¹⁰⁰⁹ for their role in (marine) plastic pollution, demonstrating the extension of environmental obligations from States to private actors.

It can be observed that these judicial developments at the national level and the evolution of international jurisprudence should not be seen as isolated phenomena, but rather as part of a broader multi-level system of international law.

Decisions by national courts demonstrate the operation of international principles domestically, translating general obligations into concrete responsibilities for States and private actors. At the same time, international rulings, such as the ICJ Advisory Opinion on the obligations of States concerning climate change, strengthen and clarify the global normative framework, providing interpretative guidance that shapes the development of domestic and regional regulations.

Specifically, the ICJ's AO provides a decisive, bold, and unequivocal stance on a politically charged matter. With negotiations underway for the first LBI addressing the entire life cycle of plastics, the forthcoming Global Plastics Treaty represents a critical moment to observe how the Court's ruling will be applied in practice.

The Court confirmed that States hold a binding legal obligation to prevent climate-related harm. Considering that approximately 80% of GHG emissions linked to plastics occur during production, countries aiming to avoid liability for actions contributing to carbon emissions must implement the ICJ's guidance by addressing both the production and consumption of plastics. Consequently, as negotiations advance toward – yet – another session, any target to reduce plastic production must include a commitment to

¹⁰⁰⁸ The cases *People v. PepsiCo, Inc., et al.* and *Rodriguez, et al. v. Exxon Mobil Corporation, et al.* were selected for discussion in this thesis because they represent recent, high-profile legal actions involving major corporate actors responsible for environmental harm. While these cases are not necessarily precedent-setting in the legal sense, they serve as illustrative examples of how courts and litigants are increasingly attempting to hold private entities accountable for contributions to (marine) plastic pollution. Moreover, their public visibility highlights the growing societal and legal attention to corporate responsibility in the environmental domain, making them particularly relevant for understanding contemporary developments in environmental law and corporate accountability.

¹⁰⁰⁹ Depending on the context and the interpretative framework adopted, a company may be held legally liable, or socially and in terms of corporate governance, accountable.

curb virgin plastic output in line with the 1.5°C climate objective, as required by both scientific evidence and legal obligations.

The Advisory Opinion also emphasises the responsibilities of private actors, noting that States are required to regulate emissions from non-state entities. In particular, States bear a legal duty to oversee GHG emissions generated by private companies and investors across all sectors, especially the petrochemical industry, as the Court recognises that

(...) a State may be responsible where, for example, it has failed to exercise due diligence by not taking the necessary regulatory and legislative measures to limit the quantity of emissions caused by private actors under its jurisdiction¹⁰¹⁰. (*author's emphasis*)

This ruling is likely to have a significant impact on corporate actors in the petrochemical – and, consequently, plastics – sector, given that petrochemicals (and most plastics) are derived from fossil fuels.

In this context, international law serves as the overarching framework within which both legislative strategies and judicial interpretation develop, translating obligations and principles into concrete measures for managing plastic pollution and protecting environmental human rights.

- *People v. PepsiCo, Inc., et. al.*

The Los Angeles County (USA) has filed a lawsuit against beverage giants *PepsiCo* and *Coca-Cola*, alleging that the companies misled consumers about recycling's effectiveness in reducing plastic waste. On 29 October 2024, the county filed legal action against *PepsiCo Inc.*, *The Coca-Cola Company*, and their bottling partners in California state court, citing violations of public nuisance and business practices laws.

The lawsuit alleges that the companies have misleadingly promoted recycling as an effective solution for alleviating the environmental harm caused by their single-use plastic products, which continue to pile up globally despite their corporate pledges to reduce plastic consumption¹⁰¹¹.

In its arguments, the Plaintiff emphasises that Coca-Cola and PepsiCo have promoted “false” CE strategies to the consumers, advertising them as a “solution” for the problem cause – plastic pollution. In fact, Coca-Cola has promoted its “*packaging*

¹⁰¹⁰ ICJ (2025). *Ob. cit.*, p. 122.

¹⁰¹¹ Superior Court of California (2024a). *People v. PepsiCo, Inc., et. al.* Complaint, No. 24STCV28450 (Cal. Super. Ct. Oct. 30, 2024). Available at: https://climatecasechart.com/wp-content/uploads/case-documents/2024/20241030_docket-24STCV28450_complaint.pdf. Accessed on 09 December 2024.

solutions” affirming that it offers several types of packaging formats, which would play an important role in the reduction of packaging waste and emissions. Allegedly, the company focuses its efforts on using “*more recycled material*” in the primary packaging and “*supporting collection rates*”¹⁰¹².

PepsiCo, on its turn, advertises a “*sustainable packaging vision*” or the “*pep+ packaging agenda*”, which would play a fundamental role in delivering its products, in a safely manner, to customers and consumers. The company emphasises its work to make the stages of its value chain “*more circular*” and announces the goal to have designed 98% of its packaging to be recyclable, compostable, biodegradable or reusable by 2025¹⁰¹³.

Seizing a valuable opportunity to reduce their environmental impact, these companies have made bold commitments to increase the use of recycled PET in their bottles – pledging to source high percentages of their plastic packaging from recycled materials. The reality, however, is that they are not even close to reach the announced goals. In 2022, Coca-Cola’s rate of sourcing recycled plastic was at 13.6%, while PepsiCo was at 6%¹⁰¹⁴.

This demonstrates how their propaganda is far from reality. In the case of the state of California, more specifically, plastic is the leading contributor to land litter, accounting for seven of the top 10 litter items found on beaches, with food service ware representing four of these items¹⁰¹⁵. Interestingly in the lawsuit the Plaintiff states that

The plastics industry has spread deceptive information about the true impact of plastic and its recyclability for decades. Following their lead, PepsiCo and Coca-Cola have employed **similar disinformation campaigns, deceptively promising that recycling can offset any harm associated with single-use plastic bottles.** (...) However, in reality, plastic bottles can only be recycled once, if at all, making promises of a “circular economy” impossible. Moreover, PepsiCo and Coca-Cola have pushed forward purported solutions, like chemical recycling, that they know, or should know, will not solve the problem. PepsiCo and Coca-Cola have also made false promises that they would increase the use of recycled plastic by certain percentages and eliminate the use of virgin plastic. (...)

For years, consumers have purchased products in single-use plastic bottles and packaging believing, based on PepsiCo’s and Coca-Cola’s marketing, that their “disposable” products can be recycled. **They have dutifully rinsed and**

¹⁰¹² The Coca-Cola Company (2021). *Ob. cit.*, n.p.

¹⁰¹³ PepsiCo (2024). Packaging. Available at: <https://www.pepsico.com/our-impact/esg-topics-a-z/packaging#approach>. Accessed on 11 December 2024.

¹⁰¹⁴ Elgin, B. (2022). Big Soda’s Addiction to New Plastic Jeopardizes Climate Progress. Bloomberg, Green. Available at: <https://www.bloomberg.com/features/2022-coke-pepsi-plastic-recycling-climate-action/?leadSource=uverify%20wall>. Accessed on 07 December 2024.

¹⁰¹⁵ Coffee, D.; *et. al.* (2020). Plastic Waste in Los Angeles County Impacts, Recyclability, and the Potential for Alternatives in the Food Service Sector. Available at: https://innovation.luskin.ucla.edu/wp-content/uploads/2020/02/Plastic_Waste_in_LA_County.pdf. Accessed on 08 December 2024.

sorted plastic products into designated recycling bins and carted them to curbs or trash rooms believing they are doing their part to make sure that the plastic they buy does not end up as waste. Except at the margins, it is theater – a show designed to make consumers feel good about, and be willing to, **consume unprecedented volumes of Defendant’s single-use plastic.** Defendants know, and have known, **that the plastic in which their beverages are sold is not, and will not, be recycled at a scale meaningful enough to offset the significant harm associated with single-use plastic**¹⁰¹⁶. (*author’s emphasis*)

PepsiCo and Coca-Cola have consistently been listed as two of the top global plastic polluters – as it was previously analysed in Section I, Subsection A “2.2.1.1”, the Coca-Cola Company was revealed as the main plastic polluter (11%), followed by PepsiCo (5%)¹⁰¹⁷.

Further, the Plaintiff emphasises calls attention to an important aspect of plastics recyclability, as

plastics are part of a sector known as “petrochemicals,” which are **products made from fossil fuels such as oil and gas.** The vast **majority of plastics cannot be recycled;** that is, they cannot be collected, processed, and remanufactured into new products because of **both technical and economic limitations.** (...)

Nearly two-thirds of total plastic waste comes from **products that are discarded within five years of purchase.** Single-use plastics, such as plastic packaging, bags, straws, and disposable bottles and plasticware, represent the largest plastics application, and account for one-third of all plastics consumed globally. Single-use plastics comprise most of the plastic waste that escapes and/or is discharged into the environment.

(...) coastal cities, like Los Angeles, are primary sources of oceanic plastic pollution. Each year, an estimated 4.8 to 12.7 million metric tons of plastic enter the oceans. Over time, plastics that enter the oceans break down into microplastics, and even smaller nanoplastics, which are then consumed by animals. (...) A significant amount of plastics ends up in landfills, instead of being recycled. (...) The County does its part by investing millions of dollars annually for street sweeping (...) in addition to all the innovative approaches discussed above to keep oceans and other waterways clean. (...)

Defendants are significant contributors to the plastic waste crisis throughout the United States. **PepsiCo and Coca-Cola have been ranked as the world’s top plastic polluters for six consecutive years** by Break Free From Plastic and yet **they have faced little to no accountability for their plastic trash that litters areas around the globe,** including the County. PepsiCo’s and Coca-Cola’s reliance on and deceptive marketing of single-use plastics are key contributors to plastic waste.¹⁰¹⁸ (...) (*author’s emphasis*)

In view of this, the Plaintiff argues that the companies are accountable for the overflow of landfills and environmental contamination in California’s waterways,

¹⁰¹⁶ Superior Court of California (2024a). *Ob. cit.*, p. 3-5.

¹⁰¹⁷ Cowger, W.; *et. al.* (2024). *Ob. cit.*, p. 3-4.

¹⁰¹⁸ Superior Court of California (2024a). *Ob. cit.*, p. 8-17.

beaches, and urban areas¹⁰¹⁹. Additionally, the complaint emphasises the detrimental impacts of plastic pollution, such as the release of toxins and microplastics that harm plants, animals, and humans. The lawsuit cites studies suggesting that individuals may unknowingly ingest the equivalent of a “*credit card worth of plastic every week*”¹⁰²⁰.

Moreover, the Plaintiff accuses the companies with failing to disclose the risks associated with microplastics leaching from their bottles into the beverages, referencing studies that indicate 93% of bottled water is contaminated with microplastics¹⁰²¹.

As a result, the *People* finally allege that

An ordinary person would be reasonably annoyed or disturbed by these harms. The harms caused by Defendants’ nuisance-creating conduct are extremely grave, and far outweigh the social utility of that conduct. **The plastic-related harms that Defendants created, caused, contributed to, and assisted in the creation of continue to harm the County and its residents to the present day, and will continue to harm the County and its residents many years into the future.** The County and its residents did not consent to Defendant’s conduct.¹⁰²² (*author’s emphasis*)

In conclusion, the Plaintiff Seeks financial compensation and civil penalties¹⁰²³. The case is currently pending. On 2 December 2024, the Defendants filed a notice of removal with the U.S. District Court for the Central District of California. Subsequently, on 2 January 2025, the Plaintiff moved to have the case returned to the Superior Court of the State of California. On 14 March 2025, the court granted the Plaintiff’s motion, remanding the case to state court. The parties remain engaged in ongoing motion practice, with a new management conference scheduled for 20 August 2025¹⁰²⁴.

- *Rodriguez, et al. v. Exxon Mobil Corporation, et. al.*

In December 2024, Billie Rodriguez, Daniel Erwin, Michael B. Ackerman, and Kyle Foreman filed a Class Action Complaint¹⁰²⁵ against major petrochemical companies

¹⁰¹⁹ Edwards, J. (2024). Pepsi, Coca-Cola untruthful about about single-use plastic waste, lawsuit claims. Available at: <https://topclassactions.com/lawsuit-settlements/class-action-news/pepsi-coca-cola-untruthful-about-about-single-use-plastic-waste-lawsuit-claims/>. Accessed on 12 December 2024.

¹⁰²⁰ Superior Court of California (2024a). *Ob. cit.*, p. 15.

¹⁰²¹ Edwards, J. (2024). *Ob. cit.*, n.p.

¹⁰²² Superior Court of California (2024a). *Ob. cit.*, p. 35.

¹⁰²³ Edwards, J. (2024). *Ob. cit.*, n.p.

¹⁰²⁴ The Guarini Center; State Impact Center (2025a). Plastics Litigation Tracker. The People of the State of California v. Pepsico, Inc., et al., No. 2:24-cv-10340 (C.D. Cal. removed 2024) [Previously: The People of the State of California v. Pepsico, Inc., et al., No. 24STCV28450 (Cal. Super. Ct. filed 2024)]. Available at: <https://plasticslitigationtracker.org/>. Accessed on 17 August 2025.

¹⁰²⁵ A major factor behind the success of mass tort litigation in the USA is the class action procedure, along with the rise of multidistrict litigation in the federal court system. Class actions offer a strong means of redress for activities like environmental torts, which are claimed to have harmed large groups of people. This legal approach is well-established in Australia, which is no surprise given that it has the second-highest

and the American Chemistry Council, accusing them of conspiring to mislead the public about the recyclability of plastics, which “*led to the production and purchase of more plastics than otherwise would have occurred*”¹⁰²⁶.

Similar to the case *People v. PepsiCo, Inc., et. al.*, in this lawsuit the Plaintiff alleges that the Defendants have misled American consumers, considering the

(...) Defendants’ profit-driven decision to promote the idea to the American consumer that **plastics are recyclable and better for the environment, when in reality only a tiny fraction of plastics are ever recycled.**

2. Defendants’ false representations regarding the recyclability of plastics led to **increased production of plastic products, increased demand for plastics products, increased prices for plastic products and corresponding issues with the remediation of plastic waste**, all of which have harmed the citizens of Missouri and other states.¹⁰²⁷ (*author’s emphasis*)

It is interesting to note that, before that, in September 2024, the Attorney General of California filed an analogous complaint against *Exxon Mobil Corporation* for considering that the company

contributed to the **deluge of plastic pollution that has harmed and continues to harm California’s environment, wildlife, natural resources, and people.** ExxonMobil not only promotes and produces the largest amount of plastic that becomes plastic waste in California, **it has also deceived Californians for almost half a century by promising that recycling could and would solve the ever-growing plastic waste crisis.** All the while, ExxonMobil has known that mechanical recycling, and now “advanced recycling,” will never be able to process more than a tiny fraction of the plastic waste it produces.¹⁰²⁸ (*author’s emphasis*)

In *Rodriguez, et al. v. Exxon Mobil Corporation, et. al.* the Plaintiff claims that industry trade groups, starting in the 1980s, promoted recycling as a solution to concerns over landfill use and environmental harm, despite alleged doubts about its effectiveness, thus encouraging consumers to buy more plastics than they would have otherwise¹⁰²⁹.

The Plaintiffs also argue that the Defendants conspired to “*artificially increase the demand for plastics in the United States, including by restraining their respective*

number of climate liability claims worldwide, after the USA. In Europe, however, class actions are still in their early stages. In: Merkl, A.; Charles, D. (2022). *Ob. cit.*, p. 32.

¹⁰²⁶ U.S. District Court for the Western District of Missouri (2024). *Rodriguez et al. v. Exxon Mobil Corporation et al.*, No. 4:24-cv-00803 (W.D. Mo. filed 2024). Available at: https://stateimpactcenter.org/files/1_2025-01-09-151641_okjo.pdf. Accessed on 12 January 2025.

¹⁰²⁷ U.S. District Court for the Western District of Missouri (2024). *Ob. cit.*, p. 2.

¹⁰²⁸ Superior Court of California (2024b). *The People of the State of California, ex Rel. Rob Bonta, Attorney General of California (Plaintiff), v. Exxon Mobil Corporation; and does 1 through 100, inclusive (Defendants).* Available at: https://oag.ca.gov/system/files/attachments/press-docs/Complaint_People%20v.%20Exxon%20Mobil%20et%20al.pdf. Accessed on 13 December 2024.

¹⁰²⁹ Vinson & Elkins (2024). 2024 Chemicals & Energy Antitrust Report. Available at: <https://media.velaw.com/wp-content/uploads/2025/01/16164925/Annual-Energy-Chemical-Antitrust-Report.pdf>. Accessed on 23 January 2025.

production volumes” thereby restraining price competition and resulting in inflated plastic prices¹⁰³⁰.

They also bring claims under the consumer protection laws of fourteen states and the District of Columbia, as well as under state antitrust laws¹⁰³¹. The Plaintiffs are seeking to certify an indirect purchaser class of consumers who have bought plastic products since 1990 in order to secure unspecified damages and injunctive relief¹⁰³².

In conclusion, it is demanded, among others, that compensatory damages be awarded to the Plaintiffs¹⁰³³. The case is still pending.

In early 2025, the case saw multiple procedural developments. The Defendants requested and received extensions to respond to the Plaintiffs’ complaint, while the Plaintiffs filed a first amended complaint on 17 January, adding the Board of County Commissioners for Ford County, Kansas, and introducing claims of public nuisance and violations of Kansas consumer protection law¹⁰³⁴. The court granted several motions for extensions, set deadlines for motions to dismiss and oppositions, and scheduled conferences throughout the spring and summer.

Notably, Kansas Attorney General Kris Kobach intervened on 4 February to assert the state’s *parens patriae* authority, and his motion to dismiss certain claims was subsequently filed. Defendants’ motions to dismiss, supported by an *amicus curiae* brief from the U.S. Chamber of Commerce, and Plaintiffs’ responses were scheduled according to the court’s timeline. The case was later transferred to the U.S. District Court for the District of Kansas, with status conferences rescheduled, most recently to 22 September 2025¹⁰³⁵.

To summarise, Table 5 presents a concise description of both cases:

¹⁰³⁰ Superior Court of California (2024b). *Ob. cit.*, p. 48.

¹⁰³¹ The Plaintiffs allege violations of state consumer protection laws in Arkansas, California, the District of Columbia, Florida, Massachusetts, Missouri, Montana, Nebraska, Nevada, New Hampshire, New Mexico, North Carolina, Rhode Island, South Carolina, and Vermont; breaches of state antitrust laws in Arizona, California, Colorado, Connecticut, the District of Columbia, Hawaii, Illinois, Iowa, Kansas, Maine, Maryland, Michigan, Minnesota, Mississippi, Nebraska, Nevada, New Hampshire, New Mexico, New York, North Carolina, North Dakota, Oregon, Rhode Island, South Dakota, Tennessee, Utah, West Virginia, and Wisconsin; and claims of unjust enrichment. In: *Ibid.*, p. 45-89.

¹⁰³² Vinson & Elkins (2024). *Ob. cit.*, p. 46.

¹⁰³³ Superior Court of California (2024b). *Ob. cit.*, p. 91.

¹⁰³⁴ The Plaintiffs added that that Defendants “created, exacerbated, and maintained a public nuisance by increasing plastic waste”.

¹⁰³⁵ The Guarini Center; State Impact Center (2025b). Plastics Litigation Tracker. Rodriguez *et al.* v. Exxon Mobil Corporation *et al.*, No. 4:24-cv-00803 (W.D. Mo. filed 2024). Available at: <https://plasticslitigationtracker.org/>. Accessed on 17 August 2025.

Table 5 – Case-law Analytical Summary

Case	<i>People v. PepsiCo, Inc., et. al.</i>	<i>Rodriguez, et al. v. Exxon Mobil Corporation, et. al.</i>
Allegations	The Plaintiff has filed a lawsuit against PepsiCo, Inc., The Coca-Cola Company, and the bottling companies of both Pepsi and Coke, accusing them of playing a major role in the environmental and public health consequences of plastic pollution. The lawsuit claims that Defendants failed to disclose the severe environmental and health impacts of their plastic beverage containers. The Plaintiff asserts that the Defendants misled consumers by labelling their plastic products as “recyclable”, despite knowing that these products cannot be disposed of without causing harm to the environment. The lawsuit further alleges that Defendants conducted disinformation campaigns that falsely led consumers to believe that purchasing single-use plastic bottles was an environmentally responsible decision. The Plaintiff is seeking injunctive relief to stop Defendants from engaging in deceptive business practices, restitution for affected consumers, and civil penalties of up to USD 2.500 per violation.	Plaintiffs have brought a lawsuit against Exxon Mobil and 10 other companies, claiming that they violated antitrust and consumer protection laws by falsely promoting the recyclability of single-use plastic products. This misrepresentation allegedly led to an artificial increase in demand for these plastics, exacerbating the global plastic pollution crisis. The Plaintiffs demand a jury trial, an injunction, compensatory and treble damages, attorneys’ fees, and any other appropriate relief.
Status	Pending.	Pending.

In synthesis, the analysis of these cases is crucial for understanding the evolving landscape of “plastics litigation” and offers valuable insight into how legal action is attempting to address the urgency of (marine) plastic pollution – an urgency that lawmaking processes often struggle to match.

While legislative bodies may be slow to enact timely responses, these cases demonstrate how the judicial system is stepping in to address the immediate challenges posed by plastic pollution.

The harm caused by plastics, along with the associated costs for governments, businesses, and society, is gaining increasing recognition among the public, authorities, and in the courts. The first wave of legal actions addressing plastic pollution has now begun and these cases should evolve quickly as public and governmental concerns about plastic’s impact continue to rise – supported by ongoing negotiations for a LBI on plastic pollution¹⁰³⁶.

¹⁰³⁶ ClientEarth (2022). Plastics on trial: a briefing series on evolving liability risks related to plastics. Brief 4 Waste disposal & recycling. Available at: <https://www.clientearth.org/media/durfpjzw/plastics-on-trial-4-waste.pdf>. Accessed on 16 February 2025.

Some of these cases have already had interesting repercussions, such as *Smith v. Keurig Green Mountain, Inc.* In 2018, Kathleen Smith filed a class action lawsuit against the Defendant (also known as Keurig Dr. Pepper) on behalf of all Californians who had purchased “*K-Cups*” or “pods”, which were single-serve plastic coffee pods, advertised by the company as recyclable. However, most recycling facilities were not able to process these so-called recyclables “*K-Cups*”, since they were about two inches tall and wide, posing challenges for recycling plants¹⁰³⁷.

By 2022 the parties submitted a settlement agreement, which stipulated that *Keurig Green Mountain, Inc.* is prohibited from labelling, marketing, advertising, or otherwise promoting the cups as recyclable unless they “*clearly and prominently include a revised qualifying statement*”. The agreement also included provisions for the qualifying language, modifications to Keurig’s website and other advertising materials, and a proposed USD 10 million settlement¹⁰³⁸.

Plastic litigation, or legal action against the plastics industry for its role in environmental pollution, is critically important for several reasons. It might compel corporations to take responsibility for the harm caused by plastic pollution¹⁰³⁹ – by holding them legally accountable, it pressures companies to adopt sustainable practices, reduce plastic production and find alternatives to single-use plastics. It can also provide a financial incentive for companies to innovate and minimise environmental damage¹⁰⁴⁰.

Legal action can also help stop the continued proliferation of plastics, particularly in the ocean, in waterways, and in natural habitats. By targeting polluting industries, litigation can compel these companies to adopt measures that reduce the environmental burden of plastic waste. In addition, it has the potential to press companies to disclose the extent of their environmental impact – which can raise awareness about the scale of the plastic pollution problem and can encourage consumers to make more informed choices.

¹⁰³⁷ United States District Court (2020). Kathleen Smith (Plaintiff) v. Keurig Green Mountain, Inc. (Defendant), Case No. 18-cv-06690-HSG. Available at: https://climatecasechart.com/wp-content/uploads/case-documents/2020/20200921_docket-418-cv-06690_order.pdf. Accessed on 17 February 2025.

¹⁰³⁸ United States District Court (2022). Kathleen Smith, on behalf of herself and all others similarly situated (Plaintiff) v. Keurig Green Mountain, Inc. (Defendant), Case No. 4:18-cv-06690-HSG. Available at: <https://stateimpactcenter.org/files/Smith-v.-Keurig-Green-4-18-cv-06690-motion.pdf>. Accessed on 17 February 2025.

¹⁰³⁹ Litigation pathways, although already emerging for certain harms, are limited for others by uncertainties surrounding exposure, causation, attribution, and accountability. However, many of these uncertainties will diminish as scientific understanding and legal doctrines continue to evolve. In: Merkl, A.; Charles, D. (2022). *Ob. cit.*, p. 19.

¹⁰⁴⁰ That is why the claims against companies are on the rise, especially regarding the improper management of plastics throughout their life cycle or the deceptive and misleading advertising of these products. In: Varvastian, S. (2023). *Ob. cit.*, p. 662.

Besides, successful litigation can lead to stronger government policies and regulations. It can set legal precedents, prompting lawmakers to enact laws that regulate plastic production, waste management, and pollution control. Legal cases can also spark wider public debates about the need for systemic changes in how plastic is used and disposed of.

In essence, plastic litigation not only holds polluting companies responsible but also serves as a crucial mechanism to push for lasting environmental and regulatory change, reduce health risks, and protect future generations from the harmful impacts of plastic pollution.

The role of courts in plastic pollution governance is set to expand, offering more opportunities to tackle the emerging issues in plastic pollution litigation. While litigation alone cannot resolve a crisis of this scale, it can play a crucial role in setting the agenda and framing the issues in this crisis, similar to how it has influenced other widespread environmental challenges, such as climate change¹⁰⁴¹.

The examination of various types of claims in plastic pollution litigation and how courts have addressed them highlights several trends in plastic pollution governance. This does not mean that litigation solves the problems generated by legal gaps, nor that the existence of a LBI dedicated to plastic pollution will end litigation cases.

Litigation serves as an important regulatory tool, regardless of whether policy action is taken. It should not be dismissed even with stronger policy implementation, as it helps fill gaps, allows individuals and organisations to highlight negative impacts and injustices, maintains pressure on governments to address other aspects of the issue, and strengthens the resolve of political leaders who follow those who created the original policies¹⁰⁴².

Besides, some developments in international law might indicate an increased likelihood of litigation. For instance, strengthening international standards and regulations can trigger litigation by setting clear liability criteria. However, regulation can also have a dampening effect on litigation by raising expectations of responsible behaviour and lowering the risk of liability – in some cases, claims may decrease naturally if the regulator has successfully met its goal of protecting the public from harm¹⁰⁴³.

¹⁰⁴¹ Peel Peel, J.; Osofsky, H.M. (2015). *Ob. cit.*, p. 219.

¹⁰⁴² Osofsky, H.M. (2010). The Continuing Importance of Climate Change Litigation. **Washington & Lee Public Legal Studies Research Paper Series**, p. 1-45. Available at: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1529669. Accessed on 13 December 2024.

¹⁰⁴³ Merkl, A.; Charles, D. (2022). *Ob. cit.*, p. 34.

Synthesis of the chapter

This Chapter provides a comprehensive examination of the global plastic pollution crisis, focusing on its environmental, economic, and legal dimensions.

It begins by highlighting the profound environmental, economic, and social costs associated with plastic pollution. Plastics, particularly single-use ones, are the primary contributors to marine litter, with vast quantities accumulating in the ocean, harming ecosystems, and threatening biodiversity.

Moreover, plastic waste imposes substantial economic costs, including those directed at cleaning up debris, protecting biodiversity, and mitigating the harmful effects on fishing, tourism, and other industries. The financial burden on local and national governments to deal with plastic pollution is significant, and the failure to effectively manage plastic waste is exacerbating the crisis.

In this regard, a central theme of the chapter is the concept of the Circular Economy, which advocates for designing products and systems that enable the reuse, recycling, and reduction of waste. Corporate giants, particularly in the beverage and petrochemical industries, have marketed recycling as a viable solution to the plastic waste crisis, with companies like *Coca-Cola* and *PepsiCo* promoting their packaging as recyclable.

However, it is revealed that this propaganda often falls short in reality. The actual recycling rates for plastics are abysmally low, with the majority of plastic waste either not being recycled or being downcycled into lower-quality products. The CE, as marketed by these corporations, is shown to be more of a corporate strategy to manage consumer expectations rather than a sustainable environmental solution. The widespread promotion of a “recyclable” plastic narrative has perpetuated the production and consumption of single-use plastics, compounding the pollution problem.

The international trade of plastic waste, thus, assumes particular importance, especially after the 2018 “China ban” on plastic waste imports, which led many Western countries to redirect their plastic waste to other developing nations in the Global South, where environmental regulations are weaker, and waste management infrastructure is less robust. This “waste colonialism” results in significant environmental harm to the receiving countries, which lack the capacity to process and recycle large amounts of plastic waste. The chapter underscores the ethical and environmental concerns of this trade and the unjust burden it places on less-developed nations.

This situation leads to reflections on responsibility for so much damage: whose is it? For this reason, a critical element of the chapter is the analysis of the responsibilities

of governments at national and international levels to regulate plastic production, waste management, and recycling. States are tasked with enforcing environmental laws, ensuring compliance with international conventions on marine pollution, and holding industries accountable for their contributions to plastic waste.

However, there is a gap between environmental law and enforcement, as many governments fail to adopt adequate regulatory measures or effectively manage plastic waste. The lack of cohesive global governance on plastic pollution is noted as a major challenge, particularly given the transnational nature of the problem. The chapter also examines state liability for environmental harm, pointing out that while some countries have made strides in introducing legal frameworks for environmental protection, others remain laggards in terms of accountability.

Another important element when seeking for accountability is plastic litigation, which has emerged as a powerful tool for holding corporations liable for their role in the plastic pollution crisis.

Several high-profile lawsuits have been filed against major plastic producers, which are mainly accused of misleading the public about the information they make available to the consumers, and of contributing to the environmental and health consequences of plastic pollution. Two key cases discussed in the chapter are *People v. PepsiCo, Inc.* and *Rodriguez, et al. v. Exxon Mobil Corporation*, both of which target major corporations like *PepsiCo*, *Coca-Cola*, and *ExxonMobil* for their misleading propaganda about the recyclability of plastics.

The chapter concludes by emphasising the growing role of courts in plastic pollution governance. As legislative bodies struggle to pass timely and comprehensive laws to tackle plastic pollution, the judiciary has stepped in to hold corporations accountable.

Court cases can not only provide remedies for the affected communities but also set legal precedents that force companies to change their practices and policies. Litigation, however, is not a “silver bullet” for the plastic pollution crisis. It must be accompanied by stronger global regulations and more robust waste management systems to address the root causes of plastic pollution.

Nevertheless, litigation remains a vital tool for raising awareness, pushing for corporate accountability, and creating pressure on governments to take decisive action. This does not, however, replace the pressing need to overcome the most critical gap of all: the absence of an international treaty specifically focused on plastic pollution.

In this sense, Part II of this thesis is entirely dedicated to the analysis of the current scenario of negotiations for the future LBI on plastics, which are still ongoing.

3 TOWARDS THE DEVELOPMENT OF AN INTERNATIONAL REGIME TO COMBAT (MARINE) PLASTIC POLLUTION

As concluded in Part I of this thesis, plastic pollution is currently being addressed in a fragmented manner, with a lack of a holistic approach and an over-reliance on a linear model for managing plastics as a material.

The existing governance framework is insufficient and lacks a dedicated treaty, failing to adequately protect the environment and human health from the associated risks of plastic pollution.

Recognising the scale of the problem, the world's nations have decided that a dedicated treaty is the next necessary step in managing plastic pollution. This Part of the thesis, hence, focuses on analysing the latest discussions surrounding negotiations for a LBI aimed at, among other goals, promote the sustainable management of plastic waste, including in the ocean.

Since 2014 the international community has been discussing the urgency of the plastics problem and, in 2017, through Resolution 3/7 on Marine Litter and Microplastics¹⁰⁴⁴, following the commitment made by states in the declaration “Our Ocean, Our Future: Call for Action”¹⁰⁴⁵, an *ad hoc* group of experts on marine litter and microplastics was established at the third session of UNEA (UNEA-3)¹⁰⁴⁶ to discuss options for addressing plastic pollution at a global level – on the basis that maintaining the *status quo* is not an option¹⁰⁴⁷.

In 2022, a historic moment marked the start of negotiations for the Global Agreement on Plastics: heads of State, Environment Ministers and other representatives of 175 nations endorsed Resolution 5/14 during UNEA-5 to “End Plastic Pollution” and develop a LBI on plastic pollution by the end of 2024¹⁰⁴⁸.

¹⁰⁴⁴ UNEP (2018e). **3/7. Marine litter and microplastics**. United Nations Environment Assembly of the United Nations Environment Programme (UNEP/EA.3/Res.7. 3/7). Available at: <https://undocs.org/UNEP/EA.3/Res.7>. Accessed on 22 December 2021.

¹⁰⁴⁵ With the full participation of civil society and other relevant stakeholders, States affirmed a strong commitment to conserve and sustainably use the ocean, seas and marine resources for sustainable development. For more, *see supra* p. 161-162. In: UNGA (2017a). *Ob. cit.*, n.p.

¹⁰⁴⁶ The *ad hoc* open-ended expert group on marine litter and microplastics was formed during the third session of the in response to UNEP/EA.3/Res.7 on Marine Litter and Microplastics. At UNEA-4, the expert group's mandate was extended in accordance with operative paragraph 7 of Resolution UNEP/EA.4/Res.6 on Marine Plastic Litter and Microplastics. In: UNEA (2022b). Ad hoc open-ended expert group on marine litter and microplastics. Available at: <https://www.unep.org/environmentassembly/expert-group-on-marine-litter>. Accessed on 18 February 2023.

¹⁰⁴⁷ Simon, N.; *et. al.* (2021). *Ob. cit.*, p. 43.

¹⁰⁴⁸ UNEP (2022h). Historic day in the campaign to beat plastic pollution: Nations commit to develop a legally binding agreement. Press release – Environmental rights and governance. Available at:

Plastics will thus become one of the few substances to have its own treaty, highlighting the complexity of the issue. As the global treaty is being developed, it is crucial to consider how the agreement will be structured to effectively address this multifaceted challenge.

The key research questions explored in Part II, therefore, are:

- i) What are the potential architectural models for a new plastics treaty?
- ii) What design elements can incentivise participation without undermining the treaty's effectiveness?
- iii) How can the future treaty operate with existing international frameworks to enhance global cooperation and avoid overlaps?
- iv) What synergies can the future treaty establish with other international environmental agreements, such as the framework for climate change?

The first critical consideration in designing the treaty is the underlying order of international relations. Given the decentralised nature of international authority, States must collaborate to address transnational environmental issues.

State sovereignty prevents any single government or institution from imposing obligations on other states without their consent. Additionally, there is no global government or higher authority to enforce agreements between states.

This creates challenges in addressing transnational externalities. Therefore, it is essential to create strong enough incentives for states to join the international agreement, referred to as participation incentives, and to ensure compliance with the treaty's obligations, which requires effective compliance incentives.

In addition to the foundational challenges of international relations and state sovereignty, the design of the treaty must also account for the scientific, economic, and social dimensions of plastic pollution. Given the global scope of the problem, the treaty will need to incorporate diverse perspectives, ensuring that the specific needs and capacities of different countries are addressed, particularly those in the Global South that may lack the infrastructure and resources to tackle plastic pollution.

Furthermore, as plastic pollution is intrinsically linked to broader environmental issues such as ocean health, climate change, and biodiversity loss, it is crucial that the treaty not operate in isolation. Its relationship with existing environmental frameworks, especially the Paris Agreement on climate change, must be carefully examined to ensure

that synergies are maximized while avoiding overlaps or contradictions in international law.

A critical aspect of the treaty's design will be its ability to incentivise participation and ensure compliance across a wide range of stakeholders, including states, private sector actors, and civil society organisations. This includes not only financial and technical support for developing countries but also the development of robust monitoring, reporting, and accountability mechanisms to track progress and ensure that commitments are met.

The treaty's success will ultimately depend on its ability to create a cohesive international governance framework that aligns with global priorities and fosters cooperation at all levels, from local to global.

In addressing these questions and challenges, Part II analyses the context, content, and structure of Resolution 5/14, exploring the negotiation sessions and the key elements of the draft treaty. This analysis offers insights into how the treaty can be shaped to effectively combat (marine) plastic pollution, while also fostering the necessary cooperation between states and other stakeholders to address this urgent global crisis. By examining the relationships between ocean-climate and plastics-climate nexus, this Part of the thesis provides a comprehensive understanding of how the new treaty can contribute to the broader environmental governance landscape, enhancing both the climate agenda and the transition toward a circular economy.

3.1 The Content of Resolution 5/14 and the Negotiations for a New Treaty: Legal Reflections on the Approach and Structure of the Future Instrument

Plastic pollution has become an increasingly prominent issue at global environmental forums such as the UNEA meetings, due to its far-reaching negative impacts on marine and terrestrial ecosystems, as well as the profound economic, health, and social consequences for humans and other living beings.

The urgency of addressing plastic pollution has sparked widespread calls for comprehensive action. This has led the international community to push for the establishment of a new Multilateral Environmental Agreement that includes legally binding provisions aimed at combating plastic pollution on a global scale.

In March 2022, this collective call for action culminated in the adoption of Resolution 5/14 at UNEA-5.2, where 175 countries laid the foundation for a new international legally binding instrument to address the issue.

This Resolution mandated UN Member States to initiate negotiations toward developing a framework that would tackle plastic pollution from a holistic, lifecycle-based perspective.

These negotiations – originally planned to conclude after five rounds by the end of 2024 – were expected to culminate in the drafting of a final text for adoption and signature at the Diplomatic Plenipotentiary Conference in 2025. The process remains deliberative, incorporating contributions from Member States, stakeholders, and other relevant actors. However, instead of being finalised in August 2025, which already represented a delay relative to the UNEA mandate, the negotiations were once again adjourned for a third part of the fifth (INC 5.3) on a date yet to be announced.

Resolution 5/14 envisions an instrument that combines legally binding obligations with voluntary provisions, emphasising the need for a targeted approach that takes into account the entire lifecycle of plastics.

This includes promoting sustainable production and consumption, advancing circular economy principles, enhancing waste management systems, and encouraging resource conservation.

Importantly, the treaty must also be adaptable to the diverse implementation capabilities of individual countries. It calls for strengthened mechanisms for cooperation at both national and international levels, and urges all relevant parties, including the private sector, to align with a shared vision.

The Resolution further underscores the necessity of integrating scientific research, indigenous knowledge, and the experiences of traditional and local communities into the negotiation process. It also advocates for learning from the informal sector and cooperatives that have successfully managed plastic waste. Additionally, the importance of securing financial support for developing countries, through technical assistance and technology transfer, is highlighted.

This chapter, hence, delves deeper into the foundational elements guiding these negotiations, beginning with a focus on ocean diplomacy, which plays a pivotal role in shaping the discourse around plastic pollution and fostering global cooperation. Understanding the intersection of ocean diplomacy with environmental policies is crucial for assessing the broader geopolitical dynamics that influence these negotiations.

Furthermore, the chapter provides an analysis of the structure of the treaty itself, examining its proposed provisions and the mechanisms designed to ensure its effectiveness. By examining both the diplomatic framework and the treaty's structural design, it is possible to better appreciate the challenges and opportunities that lie ahead in the pursuit of a global solution to (marine) plastic pollution.

From that, the focus is directed to the negotiation process, providing an in-depth analysis of the rounds of negotiations, their successes, challenges, and the evolving stances of different countries on contentious issues such as plastic production limits, chemical additives, and financing mechanisms.

As the treaty enters its final phase with INC-5, the expectations for the treaty's outcome are also explored, considering the potential for a high-ambition, medium-ambition, or low-ambition framework.

This chapter also reflects on the prospects for a comprehensive, globally binding instrument that addresses the entire plastic lifecycle, with particular emphasis on the need for global cooperation, equitable financial support, and the incorporation of a just transition for all affected stakeholders.

3.1.1 The Path towards Resolution 5/14: exploring the United Nations Environment Assembly Mandate

Back in 2014, UNEA recognised that ocean health and marine biodiversity were negatively affected by MPP – among other forms of pollution. As a result, it expressed concern about the serious impact that marine litter, including plastics from land-based and marine sources, could have on the ocean, marine ecosystem services, marine natural resources, fisheries, tourism and the economy, as well as the potential risks to human health. It therefore highlighted the relevance of a precautionary approach, according to which the lack of full scientific certainty should not be used to postpone cost-effective measures to prevent environmental degradation, especially when there is a threat of serious or irreversible damage¹⁰⁴⁹.

After years of preparation by various states and stakeholders, the UN Member States reached a historic agreement in March 2022 to begin negotiations on a new treaty to address plastic pollution¹⁰⁵⁰. This was a highly anticipated and welcomed development, marking a significant step toward controlling a major pollutant impacting the world's ocean and environment.

The UNEA Resolution 5/14 “End Plastic Pollution: Towards an International Legally Binding Instrument”¹⁰⁵¹ adopted during UNEA-5 in Nairobi, outlined a mandate for the creation of an Intergovernmental Negotiating Committee (INC) tasked with working towards an international LBI on plastic pollution, deciding that

(...) the intergovernmental negotiating committee is to develop an international legally binding instrument on plastic pollution, **including in the marine environment**, (...) which could include **both binding and voluntary approaches**, based on a **comprehensive approach that addresses the full life cycle of plastic**, taking into account, among other things, the principles of the Rio Declaration on Environment and Development, as well as national circumstances and capabilities, and including provisions:

- (a) To specify the objectives of the instrument;
- (b) To **promote sustainable production and consumption of plastics** through, among other things, product design and environmentally sound waste management, including through resource efficiency and **circular economy approaches**;
- (c) To promote **national and international cooperative measures to reduce plastic pollution in the marine environment**, including existing plastic pollution;

¹⁰⁴⁹ UNEP (2019f). Note by the Secretariat – Compilation of United Nations Environment Assembly resolutions on marine litter and microplastics (UNEP/AHEG/2019/3/INF/2). Ad hoc open-ended expert group on marine litter and microplastics Third meeting Bangkok, 18–22 November 2019. Available at: https://wedocs.unep.org/bitstream/handle/20.500.11822/32238/UNEAML_en.pdf?sequence=1&isAllowed=y. Accessed on 17 December 2021.

¹⁰⁵⁰ UNEP (2022h). *Ob. cit.*, n.p.

¹⁰⁵¹ UNEA (2022a). *Ob. cit.*, n.p.

- (d) To **develop, implement and update national action plans** reflecting country-driven approaches to contribute to the objectives of the instrument;
- (e) To promote national action plans to work towards the prevention, reduction and elimination of plastic pollution, and **to support regional and international cooperation**;
- (f) To specify **national reporting**, as appropriate;
- (g) To periodically assess the **progress of implementation** of the instrument;
- (h) To **periodically assess the effectiveness of the instrument** in achieving its objectives;
- (i) To provide scientific and socioeconomic assessments related to plastic pollution;
- (j) To increase knowledge through awareness-raising, education and the exchange of information;
- (k) To **promote cooperation and coordination** with relevant regional and international conventions, instruments and organizations, while recognizing their respective mandates, avoiding duplication and promoting complementarity of action;
- (l) **To encourage action by all stakeholders, including the private sector**, and to promote cooperation at the local, national, regional and global levels;
- (m) To initiate a multi-stakeholder action agenda;
- (n) To specify arrangements for capacity-building and technical assistance, technology transfer on mutually agreed terms, and financial assistance, recognizing that **the effective implementation of some legal obligations under the instrument will depend on the availability of capacity-building and adequate financial and technical assistance**;
- (o) To promote research into and development of sustainable, affordable, innovative and **cost-efficient approaches**;
- (p) To address compliance; (...) ¹⁰⁵². (*author's emphasis*)

The ambition was to finalise the work by the end of 2024 – although INC-5's negotiators failed the mandate, leading to the scheduling of a third part to the fifth session (INC 5.3) at a date and venue yet to be determined¹⁰⁵³. While the mandate itself is not a LBI among states, it serves as a key guide in the negotiation process and in the drafting of the treaty text.

Ultimately, participating states may choose to deviate from certain elements outlined in the mandate, but Resolution 5/14 remains a crucial starting point for the INC, making it an important aspect to examine. This section, thus, provides an in-depth analysis of the content of Resolution 5/14.

In this sense, Subsection A “3.1.1.1” discusses the role of science diplomacy (or ocean diplomacy) in shaping international efforts to tackle plastic pollution, especially in the context of the negotiations for the new LBI. As science diplomacy intersects with foreign policy to foster international cooperation – with scientific knowledge guiding diplomacy – this “tool” has been largely used throughout this process. The subsection stresses that science diplomacy is essential in addressing pressing global challenges like plastic pollution, noting the growing recognition of the need to integrate scientific

¹⁰⁵² UNEA (2022a). *Ob. cit.*, p. 2-3.

¹⁰⁵³ UNEP (2025a). *Ob. cit.*, n.p.

knowledge into international treaties and agreements. By improving the science-policy interface, science diplomacy aims to foster international cooperation, support national strategies, and guide the development of the new treaty.

Subsection B “3.1.1.2” concludes the Section by deepening the analysis of the elements that form the structure of the future treaty. It emphasises the common but differentiated responsibilities principle while also integrating other key principles like the precautionary principle, polluter pays principle, and non-regression. It stresses the need for equity, considering the historical contributions and current capabilities of developed and developing countries.

The subsection also advocates for a full life-cycle approach to plastic pollution, linking Extended Producer Responsibility schemes to sustainability. Financial assistance, technology transfer, and capacity-building for developing countries are vital, but they shouldn’t hinder progress. Lastly, the subsection calls for the inclusion of CE approaches and emphasises a global, cooperative solution to plastic pollution.

3.1.1.1 Science as the Foundation: Advancing Ocean Diplomacy?

Before examining the content of Resolution 5/14, it is essential to highlight the role of scientific diplomacy (or ocean diplomacy) in the ongoing negotiations for the future LBI, as it is crucial to ensuring that the treaty is grounded in comprehensive scientific data to effectively address the complexity and scope of the issue – and science diplomacy holds significant relevance for ocean governance and economy¹⁰⁵⁴.

Science diplomacy is a phenomenon of the 21st century¹⁰⁵⁵ and denotes the application of scientific interactions between nations to manage the shared problems facing humanity and to develop constructive, knowledge based international alliances¹⁰⁵⁶. It belongs to the field of public policies and covers varied practices, identified from the major objectives pursued by the States that engage in it: attract, cooperate, and influence¹⁰⁵⁷.

As a particular field of international relations where the interests of science and those of foreign policy intersect, science diplomacy was first applied and analysed in the USA and the United Kingdom – pioneer countries in the field¹⁰⁵⁸ – being currently claimed by a growing number of countries¹⁰⁵⁹.

Ever since, science diplomacy has developed and unfolded into different activities¹⁰⁶⁰. As scientific knowledge has become more specialised, international negotiations require a greater amount of expert input; also, the ability to integrate the

¹⁰⁵⁴ Gonçalves, L.R.; Polejack, A.A.S. (2022). *Governança, Cooperação e Diplomacia no Oceano*. In: **Economia Azul – Vetor para o Desenvolvimento do Brasil**. Santos, T.; et. al. (Orgs). São Paulo, SP: Essential Idea Editora, p. 139. ISBN 978-65-86394-07-8.

¹⁰⁵⁵ Science diplomacy has its roots in the realms of security, mainly due to the conflict between the United States of America (USA) and Iraq, which culminated with the 9/11 tragic events. In: Turekian, V. (2018). The Evolution of Science Diplomacy. **Global Policy**, vol. 9, p. 5-7. DOI: <https://doi.org/10.1111/1758-5899.12622>. Available at: <https://onlinelibrary.wiley.com/doi/10.1111/1758-5899.12622>. Accessed on 15 May 2024.

¹⁰⁵⁶ American Association For The Advancement Of Science (2010). New frontiers in science diplomacy: Navigating the changing balance of power. **The Royal Society**, p. 2. ISBN: 978-0-85403-811-4. Available at: https://www.aaas.org/sites/default/files/New_Frontiers.pdf. Accessed on 03 May 2024.

¹⁰⁵⁷ Ruffini, P.B. (2019). *Diplomatie scientifique. De quelques notions de base et questions-clés*. **Philosophia Scientiæ**, vol. 23, n. 3, p. 67. Available at: <https://journals.openedition.org/philosophiascientiae/2064>. Accessed on 25 April 2024.

¹⁰⁵⁸ In 2010, the Royal Society and the American Association for the Advancement of Science (AAAS) published a seminal report, resulting from a conference on the theme New Frontiers in Science Diplomacy, therefore giving science diplomacy an initial definition and conceptual framework. In: Mauduit, J.C.; Soler, M.G. (2020). Building a Science Diplomacy Curriculum. **Frontiers in Education**, vol. 5, p. 2. Available at: <https://www.frontiersin.org/journals/education/articles/10.3389/feduc.2020.00138/full>. Accessed on 13 May 2024.

¹⁰⁵⁹ Ruffini, P.B. (2019). *Ob. cit.*, p. 67-68.

¹⁰⁶⁰ Brunon-Meunier, C. (2023). *La diplomatie scientifique : un concept encore à inventer ? Science de la durabilité* - Fiche n° 7 (Références IRD - Institut de Recherche pour le Développement), p. 2. Available at: https://www.ird.fr/sites/ird_fr/files/2023-02/Fiche_SciDur_73%20Brunon-Meunier.pdf. Accessed on 12 April 2024.

various disciplines required to solve problems is essential for the application of science and technology to development, therefore negotiators must handle both specialisation and integration to practice international diplomacy¹⁰⁶¹.

A wide field is open: from the continuous monitoring of political commitments to the rise of science-society dialogue, to coalitions of transition actors, to the highlighting of academic and scientific networks working on solutions for sustainable development on the planet – creativity must be there¹⁰⁶².

UNESCO understands science diplomacy as “*using science to promote peace and sustainable development*”¹⁰⁶³. The Madrid Declaration on Science Diplomacy, in turn, defines it as “*a series of practices at the intersection of science, technology and foreign policy*”¹⁰⁶⁴. Instead, the New Frontiers in Science Diplomacy report presents three dimensions of the concept, divided in: i) science in diplomacy; ii) diplomacy for science; and iii) science for diplomacy¹⁰⁶⁵.

Thus, for enhancing “*the provision of science and technology advice to multilateral negotiations and the implementation of the results of such negotiations at the national level*”¹⁰⁶⁶, the UNCTAD decided to launch a science diplomacy initiative in 2001, whose main goal has been to increase scientists’ and diplomats’ ability to take part in international negotiations – especially for those coming from developing nations¹⁰⁶⁷.

The application of three dimensions to the conceptualisation of science diplomacy – a pioneering approach¹⁰⁶⁸ – is predicated on the recognition that science and politics are its primary components¹⁰⁶⁹. Also, according to these definitions, the focus of science diplomacy should be on applying scientific knowledge, resources, and instruments to an international endeavour with the goal of addressing global issues such as environmental

¹⁰⁶¹ UNCTAD (2003). Science and Technology Diplomacy: Concepts and Elements of a Work Programme. United Nations, New York and Geneva, p. 3. Available at: https://unctad.org/system/files/official-document/itetebmisc5_en.pdf. Accessed on 10 May 2024.

¹⁰⁶² Brunon-Meunier, C. (2023). *Ob. cit.*, p. 2.

¹⁰⁶³ UNESCO (2016). UNESCO receives 2016 Science Diplomacy Award. News, 2016. Available at: <https://www.unesco.org/en/articles/unesco-receives-2016-science-diplomacy-award>. Accessed on 09 May 2024.

¹⁰⁶⁴ S4D4C (2019). The Madrid Declaration on Science Diplomacy. Using Science In/For Diplomacy for Addressing Global Challenges. Available at: <https://www.s4d4c.eu/s4d4c-1st-global-meeting/the-madrid-declaration-on-science-diplomacy/>. Accessed on 03 May 2024.

¹⁰⁶⁵ American Association For The Advancement Of Science (2010). *Ob. cit.*, p. 4.

¹⁰⁶⁶ UNCTAD (2003). *Ob. cit.*, p. 3.

¹⁰⁶⁷ American Association For The Advancement Of Science (2010). *Ob. cit.*, p. 4.

¹⁰⁶⁸ Ruffini, P.B. (2019). *Ob. cit.*, p. 68.

¹⁰⁶⁹ Beltran, M.; *et. al.* (2024). Rethinking marine plastics pollution: Science diplomacy and multi-level governance. **International Review of Administrative Sciences**, vol. 90, n. 1, p. 237-258. Available at: <https://journals.sagepub.com/doi/full/10.1177/00208523231183909>. Accessed on 06 May 2024.

degradation, biodiversity loss, climate change, and public health concerns¹⁰⁷⁰ – after all, many programmes and treaties depend on the application of science and technology for their work¹⁰⁷¹.

It is, then, worth deepening the significance of each of the dimensions. First, “*science in diplomacy*” can be exemplified in the essentiality of science for addressing major global challenges – especially the environmental ones. The main goal of science in diplomacy should be to guarantee that decision-makers effectively adopt high-quality scientific advice¹⁰⁷².

In international arenas, the analyses and conclusions provided by scientists and experts contribute to fuelling negotiations between diplomats; there are even structures entirely based on assembling large groups of experts (panels)¹⁰⁷³ responsible for reporting on available knowledge and formulating diagnoses¹⁰⁷⁴.

Examples are the United Nations Framework Convention on Climate Change (UNFCCC), the Convention on Biological Diversity (CBD) and the Convention to Combat Desertification (CCD), which are treaties that offer space for the contribution of non-state, knowledge-based actors who can assemble the input of the scientific and technological community for benefiting their goals¹⁰⁷⁵.

Consecutively, “*diplomacy for science*” aims to promote global cooperation, whether it is through bottom-up cooperation between individual scientists and researchers, or “top-down” strategic priorities for research¹⁰⁷⁶.

Considering that every country strives to promote the community of its researchers on the international scene and to facilitate scientific cooperation with other countries, they essentially use two tools: signing bilateral agreements for scientific and technological cooperation; or signing multilateral agreements, in particular for the construction of large research infrastructures, in which countries share the costs and risks, but also the benefits through the participation of their researchers in multinational programs. Many scientific projects could not be carried out without the strong and lasting

¹⁰⁷⁰ Cuellar-Ramirez, P. (2021). Science Diplomacy for Climate Action and Sustainable Development in Latin America and the Caribbean: How Important Is the Early Career Perspective to New Governance? **Frontiers in Research Metrics and Analytics**, vol. 6, p. 1. DOI: <https://doi.org/10.3389/frma.2021.657771>. Available at: <https://www.frontiersin.org/journals/research-metrics-and-analytics/articles/10.3389/frma.2021.657771/full>. Accessed on 02 April 2024.

¹⁰⁷¹ UNCTAD (2003). *Ob. cit.*, p. 4.

¹⁰⁷² American Association For The Advancement Of Science (2010). *Ob. cit.*, p. 5.

¹⁰⁷³ One of the best-known examples of a mechanism for advising decision-making with scientific knowledge and data is the IPCC.

¹⁰⁷⁴ Ruffini, P.B. (2019). *Ob. cit.*, p. 69.

¹⁰⁷⁵ UNCTAD (2003). *Ob. cit.*, p. 5.

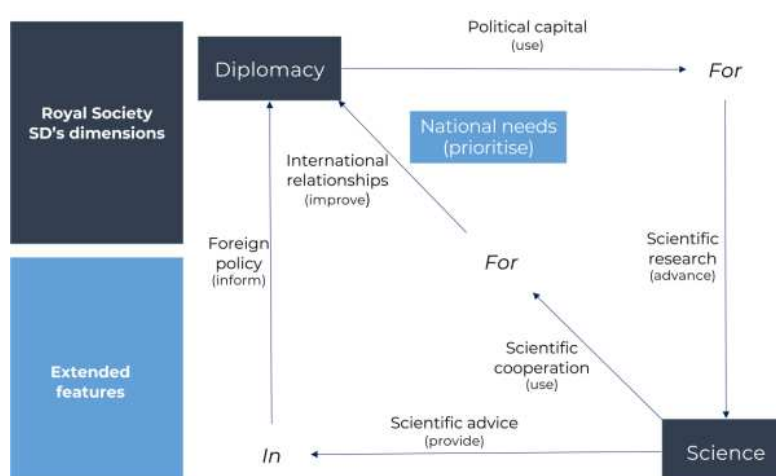
¹⁰⁷⁶ American Association For The Advancement Of Science (2010). *Ob. cit.*, p. 9.

commitment of the leaders of the most powerful countries and without the stubborn negotiation work of diplomats¹⁰⁷⁷. Thus, in summary, it seeks to facilitate international scientific cooperation¹⁰⁷⁸.

Finally, “*science for diplomacy*” can be considered as a “*soft power*”, since it has a great appeal and influence as a national asset and as a universal activity that transcends national interests. International relations, thus, can benefit from the soft power of science in numerous ways¹⁰⁷⁹: scientific relations can assist diplomacy.

This is the case when, for instance, political tensions between countries do not allow traditional diplomacy to express itself. By helping to maintain or restore relations between countries which officially have difficulty to establish a dialogue – or have even ceased it –, science acts as a substitute and vanguard of diplomacy. This is the most original dimension of scientific diplomacy, but it only applies to particular moments of international relations¹⁰⁸⁰. In this sense, Figure 35 represents features of “science for diplomacy”, by differentiating those that are characteristics of science and those pertinent to diplomacy:

Figure 35 – (Extended) Features of “Science for Diplomacy”¹⁰⁸¹



Source: Beltran, M.; *et. al.* (2024). Rethinking marine plastics pollution: Science diplomacy and multi-level governance. **International Review of Administrative Sciences**, vol. 90, n. 1.

The characteristics that define the roles of scientists include: “scientific cooperation”, providing “scientific advice” and advances in “scientific research”. The

¹⁰⁷⁷ Ruffini, P.B. (2019). *Ob. cit.*, p. 69.

¹⁰⁷⁸ Gluckman, P.D.; *et. al.* (2017). Science Diplomacy: A Pragmatic Perspective from the Inside. **Science & Diplomacy**, vol. 6, n. 4, p. 2. Available at: https://www.sciencediplomacy.org/sites/default/files/pragmatic_perspective_science_advice_dec2017_1.pdf. Accessed on 12 April 2024.

¹⁰⁷⁹ American Association For The Advancement Of Science (2010). *Ob. cit.*, p. 11.

¹⁰⁸⁰ Ruffini, P.B. (2019). *Ob. cit.*, p. 70.

¹⁰⁸¹ Beltran, M.; *et. al.* (2024). *Ob. cit.*, p. 241.

functions of diplomats can be summarised as the enhancement of “international relationships”, informing “foreign policy” and use of “political capital”.

Additionally, some advocate for an expanded use of science for diplomacy to reflect the political power pursued and exercised under the term “science diplomacy”, wherein nations represent their interests internationally using knowledge derived from the scientific method¹⁰⁸².

While this classification has been helpful for theoretical and academic discussions, it should be noted that any specific international science endeavour frequently serves multiple purposes, such as supporting the objectives of the scientific field itself and improving international relations as well¹⁰⁸³.

The scientific community is in a good position to support new forms of diplomacy that call for unconventional alliances of States, industries, and non-governmental organisations because it frequently collaborates across national boundaries on issues of shared interest. Its goal, in general, is to better align the objectives and interests of the fields of science and foreign policy¹⁰⁸⁴.

Science diplomacy exists because science is at the heart of global issues that countries must face together – as it is in the case of (marine) plastic pollution – and because science is a good tool for improving international relations¹⁰⁸⁵. Science diplomacy, consequently, has a significant power for leading transformations in order to reach sustainable development – from the present to the future.

It is important to note, nevertheless, that the focus of science diplomacy shifted significantly in the final decades of the 20th century and with the end of the Cold War, going from the use of science as a bridge for diplomatic communication¹⁰⁸⁶ to the use of science interactions as the cornerstone for tackling major global issues¹⁰⁸⁷ – as a matter of fact, the most well-known examples of science advancing foreign policy and

¹⁰⁸² Beltran, M.; *et. al.* (2024). *Ob. cit.*, p. 240.

¹⁰⁸³ Other relevant elements of science diplomacy do not fit within this classification, such as the role of science in development assistance or in resolving trade disputes, or the governance of non-jurisdictional spaces (such as Antarctica). In: Gluckman, P.D.; *et. al.* (2017). *Ob. cit.*, p. 2.

¹⁰⁸⁴ American Association For The Advancement Of Science (2010). *Ob. cit.*, p. 15.

¹⁰⁸⁵ Ruffini, P.B. (2019). *Ob. cit.*, p. 103.

¹⁰⁸⁶ It is worth noting that the dichotomy “science” v. “diplomacy” is an over-simplification but reflects that these two distinct groups exist – scientists and diplomats – and they have different cultures, values, knowledge, and abilities. In: Mauduit, J.C.; Soler, M.G. (2020). *Ob. cit.*, p. 2.

¹⁰⁸⁷ Turekian, V. (2018). *Ob. cit.*, p. 6.

diplomatic goals on a global scale are the development of the Montreal Protocol¹⁰⁸⁸ and the Intergovernmental Panel on Climate Change (IPCC)¹⁰⁸⁹.

Even though science and its applications were increasingly contributing to diplomacy, national policy did not explicitly prioritised “*science diplomacy*” until the mid-2000s¹⁰⁹⁰. The growing interest given to the scientific component in the foreign policy of States is closely linked to globalisation, new economic issues and the rise of global challenges such as emerging diseases, energy shortages, climate change, loss of biodiversity, availability of water resources, management of natural disasters, and food security¹⁰⁹¹.

To better understand and resolve these global issues, it is necessary to raise awareness and mobilise research stakeholders in international cooperation networks¹⁰⁹²; science must then contribute to informing international debates on these questions, through global or multilateral scientific bodies¹⁰⁹³.

International collaboration in science, technology, and innovation is becoming increasingly necessary due to the pressing and significant nature of current global issues¹⁰⁹⁴. States have been using science diplomacy to advance, shape and gain access

¹⁰⁸⁸ In 1974, Mario Molina and Sherwood Rowland published the results of a scientific study that concluded that chlorofluorocarbons were migrating to the upper atmosphere and affecting the ozone layer. Later, a handful of national laws were passed, and the United Nations Environment arranged an international framework treaty, the Vienna Convention for the Protection of the Ozone Layer, in 1985. After that, the Montreal Protocol was developed. In: UNEP (2017f). The Montreal Protocol: triumph by treaty. News, Stories & Speeches. Available at: <https://www.unep.org/news-and-stories/story/montreal-protocol-triumph-treaty#:~:text=The%20Montreal%20Protocol%20is%20the,protocol%2C%20and%20its%20four%20ame ndments..> Accessed on 09 March 2024.

¹⁰⁸⁹ The IPCC's reports have gained so much popularity and influence since their initial release in 1990 that it was awarded the Nobel Peace Prize in 2007, in recognition of its work. In: European Commission (2023). Humans, Science, and Policy Making: Behind the Scenes of IPCC reports. News Article. Available at: https://climate.ec.europa.eu/news-your-voice/news/humans-science-and-policy-making-behind-scenes-ipcc-reports-2023-03-20_en. Accessed on 02 February 2024.

¹⁰⁹⁰ Turekian, V. (2018). *Ob. cit.*, p. 6.

¹⁰⁹¹ The scientific community is improving its capacity to communicate knowledge (on the biggest challenges that the world faces today) to the public and decision-makers, aiming at providing a better governance for the Earth System and making society more resilient. In: Cuellar-Ramirez, P. (2021). *Ob. cit.*, p. 1.

¹⁰⁹² The challenges at the intersection of science and foreign policy, where a stronger scientific voice could contribute to bilateral and multilateral discussions and decisions about our common global concerns, have sparked a renewed interest in science diplomacy. In: S4D4C (2019). *Ob. cit.*, n.p.

¹⁰⁹³ France (2013). *Une diplomatie scientifique pour la France*. Ministère des Affaires Étrangères, Rapport, p. 2. Available at: https://www.diplomatie.gouv.fr/IMG/pdf/Rapport_Complet_DiplomatieScientifique_2013_cle8a68fb.pdf. Accessed on 07 April 2024.

¹⁰⁹⁴ Beltran, M.; *et. al.* (2024). *Ob. cit.*, p. 242.

to public opinion on cutting edge research – as international knowledge management is one of the main goals of science diplomacy¹⁰⁹⁵.

Faced with the deterioration of the state of the planet and the urgency of the ecological transition in the Global South (as in the Global North), it is urgent to associate researchers around the world and their political supervision, with economic decision-makers and civil societies, for the promotion of universal values and the preservation of global public goods¹⁰⁹⁶.

When it comes to addressing fundamental sustainable development and environmental protection-related global challenges, one should recall that science has played a major role at least since the 1972 Stockholm Conference¹⁰⁹⁷. A remarkable example is the UNFCCC's founding convention, which stated, in 1992, that its goal was to stop dangerous climate change caused by anthropogenic activities. It was only seventeen years later, at the Copenhagen Climate Conference in Denmark, that it was recognised through a consensus among scientists that global warming in the 21st century should not exceed two degrees Celsius (2° C)¹⁰⁹⁸.

Climate change mitigation is very complex in terms of organisation, governance, and the intrinsic relations it establishes with science and technology policy¹⁰⁹⁹. For instance, the 2° C goal enshrined in the UNFCCC framework is the result of diplomatic negotiations; no one has ever claimed that it is entirely scientific or apolitical – however, it has a strong intuitive logic, which is undoubtedly the reason why it was chosen¹¹⁰⁰.

This is a good demonstration that science informs politics, and both must be in harmony. Nonetheless, without diplomacy, no scientific data could really be translated into an international agreement – because diplomacy, with its methods based on dialogue,

¹⁰⁹⁵ Doğan, E.Ö.; *et. al.* (2020). Can science diplomacy address the global climate change challenge. **Environmental Policy and Governance**, vol. 31, n. 1, p. 31. Available at: <https://onlinelibrary.wiley.com/doi/epdf/10.1002/eet.1911>. Accessed on 02 May 2024.

¹⁰⁹⁶ Brunon-Meunier, C. (2023). *Ob. cit.*, p. 1.

¹⁰⁹⁷ In that case, Swedish diplomats were adept at using science to further their diplomatic goals. They first persuaded member states that a significant environmental conference should be held under the United Nations auspices and then mobilized scientific research globally. In: Paglia, E. (2021). The Swedish initiative and the 1972 Stockholm Conference: the decisive role of science diplomacy in the emergence of global environmental governance. **Humanities and social sciences communications** (Springer Nature), vol. 8, n. 2, p. 1. DOI: <https://doi.org/10.1057/s41599-020-00681-x>. Available at: <https://www.nature.com/articles/s41599-020-00681-x>. Accessed on 08 April 2024.

¹⁰⁹⁸ Sweet, W. (2016). **Climate Diplomacy from Rio to Paris: The Effort to Contain Global Warming**. Yale University Press, New Haven and London, p. 3-4. ISBN 9780300224771.

¹⁰⁹⁹ E Doğan, E.Ö.; *et. al.* (2020). *Ob. cit.*, p. 31.

¹¹⁰⁰ The “2°C goal” is the most accurate prediction that scientists have been able to provide, representing the point at which climate change will become extremely dangerous. In: Sweet, W. (2016). *Ob. cit.*, p. 17.

negotiation, and representation, allows a sovereign country to defend and promote its interests and values in its relations with other countries¹¹⁰¹.

Therefore, the nation-state actors remain the most potent players within this climate change complexity. While one should look for sources and potential solutions of these issues at the transnational, regional, or global level, the nation-state remains the policy authority for addressing global challenges. The role and influence of NGOs in environmental politics, however, becomes greater when the political stakes are lower¹¹⁰². Anyways, educational opportunities for students and practitioners with backgrounds in science and diplomacy are necessary to build bridges between these two communities¹¹⁰³.

Science diplomacy is thus an undeniably important part of achieving not only a transition towards climate neutral societies, but also towards the SDG in their entirety, in particular the targets embedded in SDG 17 “*revitalize the global partnership for sustainable development*”¹¹⁰⁴.

There is a wide-open field: from the continuous monitoring of political commitments to the rise of science-society dialogue, to coalitions of transition actors, to the highlighting of academic and scientific networks working on solutions for sustainable development on our planet, creativity must be there¹¹⁰⁵, so science diplomacy can also exist outside the framework of international cooperation¹¹⁰⁶.

While the field matures and expands across the world, there is an increasing demand for education and training¹¹⁰⁷. As the Secretary General of the UN, António Guterres, emphasised “*science is the core of solutions*”¹¹⁰⁸.

In this context, the path to the start of negotiations for the future LBI on plastics has been long, but it is undeniable that the evolution of scientific knowledge was (and is) essential to support international legal measures and to provide decision-makers with sufficient communication, specifically aimed at combating plastic pollution¹¹⁰⁹.

¹¹⁰¹ Ruffini, P.B. (2019). *Ob. cit.*, p. 68.

¹¹⁰² Doğan, E.Ö.; *et. al.* (2020). *Ob. cit.*, p. 32.

¹¹⁰³ Mauduit, J.C.; Soler, M.G. (2020). *Ob. cit.*, p. 2.

¹¹⁰⁴ Brunon-Meunier, C. (2023). *Ob. cit.*, p. 1.

¹¹⁰⁵ *Ibid.*, p. 2.

¹¹⁰⁶ Ruffini, P.B. (2019). *Ob. cit.*, p. 73.

¹¹⁰⁷ Mauduit, J.C.; Soler, M.G. (2020). *Ob. cit.*, p. 1.

¹¹⁰⁸ Organisation Météorologique Mondiale (2023). *Unis autour de la science 2023*. Coordination d'ensemble et édition par l'OMM: Lauren Stuart, Jürg Luterbacher, Roseline Devillier, Laura Paterson, Kate Solazzo et Isha Bhasin, Genève, Suisse, p. 3. Available at: <https://www.unep.org/fr/resources/rapport/unis-autour-de-la-science-2023>. Accessed on 13 April 2024.

¹¹⁰⁹ In this regard, it is important to highlight that, in addition to its relevance, ocean research remains poorly funded: it receives only a small portion – less than 2% on average – of national research budgets. In: IOC-UNESCO (2021). *Ob. cit.*, p. 10.

Plastic was seen as a product linked to benefits such as convenience, safety and hygiene until recently. The fact that plastics do not exist in a vacuum or in isolation – but as part of a global trade chain that impacts humans, the natural resources and ecosystems they depend on for survival – was ignored¹¹¹⁰.

Not so long ago, the understanding of plastic production was limited as well. Thanks to scientific advancements, it is now well-known that plastic production has direct consequences on the triple planetary crisis – biodiversity loss, pollution and climate change – constituting another urgent environmental challenge. In the absence of the necessary interventions, the amount of plastic waste entering aquatic ecosystems could almost triple to 37 million tonnes per year by 2040¹¹¹¹.

Science diplomacy – or ocean diplomacy –, in this sense, is a powerful tool for negotiating bi and multilateral agreements, seeking to implement the legal provisions contained in the various multilateral instruments that rule ocean governance¹¹¹². In fact, from a science diplomacy perspective, instruments addressing MPP have been shaped by governance structures that span multiple levels, supported by key elements of science diplomacy¹¹¹³.

The international mechanisms previously analysed in Part I of this thesis have also employed features of science diplomacy to bridge the expertise (scientific cooperation and advice) of international organisations and advanced nations in plastic pollution management with developing countries, thereby informing foreign policy. All instruments foster scientific research and technical collaboration to tackle marine environmental pollution¹¹¹⁴.

International organisations such as the GESAMP, through scientific cooperation, are ideally positioned to offer scientific advice that informs environmental policy. The scientific community has established guidelines and methodologies for analysing marine macro- and microplastics, conducting research, and offering relevant policy recommendations to member countries. Furthermore, the support and application of scientific research through international instruments are anticipated to indirectly advance scientific progress¹¹¹⁵.

¹¹¹⁰ UNEP (2021d). *Ob. cit.*, p. 10.

¹¹¹¹ UNEP (2021b). *Ob. cit.*, p. 14.

¹¹¹² Gonçalves, L.R.; Polejack, A.A.S. (2022). *Ob. cit.*, p. 140.

¹¹¹³ Arnaldi, S. (2023). **Science Diplomacy: Foundations and practice**. Trieste: EUT Edizioni Università di Trieste, p. 80. eISBN 978-88-5511-403-5 (online). Available at: <https://www.openstarts.units.it/server/api/core/bitstreams/71b32984-3958-4286-b5cb-a26cc28060f3/content>. Accessed on 17 December 2024.

¹¹¹⁴ Beltran, M.; *et. al.* (2024). *Ob. cit.*, p. 250.

¹¹¹⁵ GESAMP (2019). *Ob. cit.*, p. 83.

Protocols and conventions offer a platform for collaboration within the international community, promoting regional and multilateral agreements that are expected to influence the international relations and foreign policy of state parties. Furthermore, the creation of international and regional instruments would not have been possible without existing diplomatic ties and agreements (political capital) between the participating countries – which have, in turn, fostered scientific research. However, the use of political capital may not fully address the needs of international scientific research cooperation – as evidenced by the varying levels of commitment from countries, reflected in their reluctance to ratify conventions, protocols, and sign LBIs, often prioritising national interests over collective goals¹¹¹⁶.

The cost of addressing plastic pollution and the existing international mechanisms, however, provide little incentive for individual countries to confront this pressing issue alone. In this context, adopting a science diplomacy approach could help strengthen foreign policies and national strategies, as well as foster international cooperation and scientific endeavours, finally leading to the development and finalisation of the text of the treaty¹¹¹⁷.

After all, Resolution 5/14 emphasises that science is crucial at every stage of the process, stressing that it is urgent to

(...) **strengthen the science-policy interface at all levels**, improve understanding of the global impact of plastic pollution on the environment, and promote effective and progressive action at the local, regional and global levels, recognizing the important role played by plastics in society (...) ¹¹¹⁸.
(author's emphasis)

¹¹¹⁶ Beltran, M.; *et. al.* (2024). *Ob. cit.*, p. 250.

¹¹¹⁷ *Ibid.*, p. 253.

¹¹¹⁸ UNEA (2022a). *Ob. cit.*, p. 1.

3.1.1.2 Structure, Principles, and a Full Life-cycle Approach

The creation of treaties is undoubtedly the most widely used method for the creation of international norms¹¹¹⁹. The architecture and design of a treaty can often become a contentious issue among negotiating states. This is because these elements serve as the foundation of the treaty, shaping the obligations, if any, that states will agree to¹¹²⁰.

The stipulation of treaties and the events relating to the life of treaties (the process of formation, effectiveness, interpretation, causes of nullity, termination and suspension, i.e. the law of treaties) are governed by customary law, currently largely codified by the 1969 Vienna Convention on the Law of Treaties (VCLT)¹¹²¹. The VCLT applies only to treaties in written form concluded between States, as provided in its Article 2:

For the purposes of the present Convention:

(a) “treaty” means an **international agreement concluded between States in written form** and governed by international law, whether embodied in a single instrument or in two or more related instruments and whatever its particular designation; (...) ¹¹²² (*author’s emphasis*)

States frequently engage in international agreements, which can vary significantly across different aspects. Some of these are formal treaties, while others are categorised as “soft law”¹¹²³.

Some agreements include mechanisms for dispute resolution, while others do not, and some feature advanced monitoring systems, which may be missing from other agreements. When drafting these agreements, states often make decisions – such as opting for soft law or choosing to leave out provisions for dispute resolution or monitoring – that can undermine the strength and credibility of their commitments¹¹²⁴.

The term stipulation refers to the expression of consent by a State or other subject to be bound by the legal discipline contained in the text of a treaty. States (and other

¹¹¹⁹ Cassese, A. (2021). **Diritto Internazionale**. Quarta Edizione. Bologna: il Mulino, p. 259. ISBN: 978-88-15-29366-4.

¹¹²⁰ Guzman, A.T. (2005). The Design of International Agreements. **The European Journal of International Law**, vol. 16, n. 4, p. 579–612. DOI: 10.1093/ejil/chi134. Available at: <https://academic.oup.com/ejil/article-pdf/16/4/579/18272535/chi134.pdf>. Accessed on 22 May 2024.

¹¹²¹ The VCLT entered into force on 27 January 1980. Numerous States are part to the Convention, which represents the essential point of reference when speaking of treaties.

¹¹²² For more, see note 88 and page 147 *supra*. In: UN (2005a). *Ob. cit.*, p. 3.

¹¹²³ For more, see note 385 *supra*. In: Diniz, A.C. (2017). *Ob. cit.*, p. 390.

¹¹²⁴ Guzman, A.T. (2005). *Ob. cit.*, p. 580.

subjects of international law) have full freedom in the way they express such consent¹¹²⁵, as provided by Article 11 et seq. of the VCLT, which state that

The consent of a State to be bound by a treaty **may be expressed by signature, exchange of instruments constituting a treaty, ratification, acceptance, approval or accession, or by any other means if so agreed.**

(...) 1. The consent of a State to be bound by a treaty is **expressed by the signature of its representative** when:

- (a) the treaty provides that **signature shall have that effect**;
- (b) it is otherwise established that the negotiating States were **agreed that signature should have that effect**; or
- (c) the **intention of the State to give that effect to the signature** appears from the full powers of its representative or was expressed during the negotiation.

(...)

(...) The consent of States to be bound by a treaty **constituted by instruments exchanged between them** is expressed by that exchange when:

- (a) the **instruments provide that their exchange shall have that effect**; or
- (b) it is otherwise established that **those States were agreed that the exchange of instruments should have that effect.**

(...) 1. The consent of a State to be bound by a treaty is **expressed by ratification** when:

- (a) the **treaty provides for such consent to be expressed by means of ratification**;
- (b) it is otherwise established that the negotiating States were agreed that **ratification should be required**;
- (c) the **representative of the State has signed the treaty subject to ratification**; or
- (d) the **intention of the State to sign the treaty subject to ratification** appears from the full powers of its representative or was expressed during the negotiation.

2. The **consent of a State to be bound by a treaty is expressed by acceptance or approval under conditions similar to those which apply to ratification.**

(...) The **consent of a State to be bound by a treaty is expressed by accession** when:

- (a) the **treaty provides that such consent may be expressed by that State by means of accession**;
- (b) it is otherwise established that the **negotiating States were agreed that such consent may be expressed by that State by means of accession**; or
- (c) **all the parties have subsequently agreed that such consent may be expressed by that State by means of accession.**¹¹²⁶ (*author's emphasis*)

Both for treaties concluded in simplified form and for those concluded in solemn form, the formative process normally begins with negotiations, conducted by plenipotentiaries (*i.e.* by representatives of the State who have been granted, by the competent national bodies, full powers to conduct negotiations), and during which the parties seek an agreement on the legal discipline that will constitute the text of the treaty¹¹²⁷.

¹¹²⁵ Cassese, A. (2021). *Ob. cit.*, p. 260.

¹¹²⁶ UN (2005a). *Ob. cit.*, p. 6-7.

¹¹²⁷ Cassese, A. (2021). *Ob. cit.*, p. 261.

In addition, the structure and design of the treaty can determine whether states are willing to commit to the treaty, and if so, whether they will adhere to its obligations¹¹²⁸.

Decisions regarding the architecture and design made early in the treaty's creation are difficult to alter and can have significant and lasting effects on the agreement. Therefore, it is crucial to give careful thought to these elements when crafting a treaty¹¹²⁹.

Regarding the “choice of form”¹¹³⁰ of the plastics agreement more specifically, as it is the focus of this thesis, the mandate specifies the need for a “*legally binding instrument*”:

Underlining that further international action is needed by **developing an international legally binding instrument on plastic pollution**, including in the marine environment, (...)
 2. Acknowledges that some legal obligations arising out of a **new international legally binding instrument** will require capacity-building and technical and financial assistance in order to be effectively implemented by developing countries and countries with economies in transition;
 3. Decides that the intergovernmental negotiating committee is **to develop an international legally binding instrument on plastic pollution**, including in the marine environment, henceforth referred to as “the instrument”, which could include both **binding and voluntary approaches**, based on a comprehensive approach that addresses the full life cycle of plastic (...)¹¹³¹.
 (author's emphasis)

Ultimately, states engage into international agreements to exchange commitments regarding future actions. These agreements hold value only if the promises made are binding on the parties. Consequently, the agreements are of greater worth when they can effectively enforce those commitments¹¹³².

The Resolution 5/14, however, does not define the specific structure or architecture of this instrument, leaving negotiating states considerable flexibility in determining the treaty's framework. Thus, it is important to explore the available options.

- *Architecture*

The different ways to structure an international agreement, which are referred to as the “architecture” of a treaty, include how its various parts are organised and function together as a cohesive whole¹¹³³.

¹¹²⁸ Guzman, A.T. (2005). *Ob. cit.*, p. 581.

¹¹²⁹ Punka, A.K. (2023). *Ob. cit.*, p. 68.

¹¹³⁰ The distinction between soft law and hard law can be referred to as the choice of “form”. In: Guzman, A.T. (2005). *Ob. cit.*, p. 583.

¹¹³¹ UNEA (2022a). *Ob. cit.*, p. 2.

¹¹³² Guzman, A.T. (2005). *Ob. cit.*, p. 580.

¹¹³³ Punka, A.K. (2023). *Ob. cit.*, p. 69.

In a broader sense, the “design” of a treaty refers to how the agreement is envisioned beyond its architecture, encompassing its objectives, the type and nature of control measures, its approach to altering behaviour (if applicable), possible implementation support, monitoring mechanisms, and so on¹¹³⁴.

The main models of treaty architecture here described are not mutually exclusive, and it is possible to combine some of these features or to adopt entirely different models. For example, parties may choose a framework plus protocol structure, as seen in the Vienna Convention for the Protection of the Ozone Layer¹¹³⁵.

This type of convention establishes the framework for the regime and may outline general obligations, objectives agreed upon by the parties, and other elements. The specific regulations and measures are typically outlined in subsequent protocols, such as the Montreal Protocol on Substances that Deplete the Ozone Layer¹¹³⁶.

Another example of a framework plus protocol treaty structure is the UNFCCC, with the subsequent Kyoto Protocol¹¹³⁷. A key feature of this structure is that the convention and its protocols must be ratified separately. This can be either an advantage or a disadvantage, depending on the issue and political context¹¹³⁸.

When the issue at hand demands broad cooperation and significant changes in state behaviours – potentially impacting industries, production, and economies – a gradual, step-by-step approach may be less daunting and more likely to garner support¹¹³⁹.

This could be more attractive to participants, rather than a single, comprehensive instrument that imposes potentially overwhelming obligations all at once. However, in the case of plastics, a framework convention is understood to possibly delay the adoption of control measures, leading to a (yet another) fragmented framework¹¹⁴⁰.

¹¹³⁴ Guzman, A.T. (2005). *Ob. cit.*, p. 581.

¹¹³⁵ The Vienna Convention was the first of its kind to be signed by all participating countries, coming into effect in 1988 and achieving universal ratification by 2009. As a framework convention, it outlines principles that were agreed upon by multiple parties. However, it does not mandate countries to take specific actions to protect the ozone layer, a requirement that was later addressed through the Montreal Protocol. In: UNEP (2020e). **The Vienna Convention for the Protection of the Ozone Layer**. Ozone Secretariat – Treaties. Available at: <https://ozone.unep.org/treaties/vienna-convention>. Accessed on 16 December 2023.

¹¹³⁶ UN Treaty Collection (1987). **Montreal Protocol on Substances that Deplete the Ozone Layer** (with annex). Concluded at Montreal on 16 September 1987. Entry into force on 1 January 1989. Available at: <https://treaties.un.org/doc/publication/unts/volume%201522/volume-1522-i-26369-english.pdf>. Accessed on 16 December 2023.

¹¹³⁷ UN (1998). **Kyoto Protocol to the United Nations Framework Convention on Climate Change**. Adopted on 11 December 1997. Entry into force on 16 February 2005. Available at: <https://unfccc.int/resource/docs/convkp/kpeng.pdf>. Accessed on 15 December 2023.

¹¹³⁸ Punka, A.K. (2023). *Ob. cit.*, p. 70.

¹¹³⁹ Guzman, A.T. (2005). *Ob. cit.*, p. 588.

¹¹⁴⁰ Environmental Investigation Agency (2022a). Global Plastics Treaty: Initial Considerations for INC-1. Available at: https://resolutions.unep.org/resolutions/uploads/briefing_-_initial_considerations_for_inc-1_2022.pdf. Accessed on 18 July 2023.

Pursuant to Paragraph 5 of the Resolution 5/14¹¹⁴¹, the Secretariat of UNEP has provided a document with broad options for the structure of the international LBI on plastic pollution¹¹⁴². Regarding the structure of the treaty, the Secretariat, in fact, mentions these two options:

(...) (a) **Specific convention:** The core obligations and some control measures appear in the **body of the instrument and may be supplemented or elaborated upon by additional control measures**, such as technical information and substantive details found in one or more annexes, which form an integral part of the instrument.

(b) **Framework convention:** The convention includes the **standard structure**, categories and provisions described in section I¹¹⁴³, but some or all of the **control measures appear in one or more separate protocols to the convention**. The convention and its protocol(s) are legally distinct instruments that are usually **adopted at separate conferences**.¹¹⁴⁴ (*author's emphasis*)

Although a framework convention supplemented by protocols could be more adaptable in response to the evolving science of plastic pollution¹¹⁴⁵, it is argued that a specific convention is the most appropriate option. First, it aligns with both the letter and spirit of Resolution 5/14, which established a comprehensive mandate for control measures aimed at eliminating plastic pollution. This includes provisions to promote sustainable production and consumption of plastics (upstream¹¹⁴⁶), product design and use (midstream¹¹⁴⁷), environmentally sound waste management (downstream¹¹⁴⁸), and addressing existing pollution in the marine environment (legacy pollution¹¹⁴⁹). Settling

¹¹⁴¹ Which “Requests the Executive Director of the United Nations Environment Programme to convene an ad hoc open-ended working group to hold one meeting during the first half of 2022 to prepare for the work of the intergovernmental negotiating committee and to discuss in particular the timetable and organization of the work of the committee, taking into account the provisions and elements identified in paragraphs 3 and 4 of the present resolution; (...)”. In: UNEA (2022a). *Ob. cit.*, p. 4.

¹¹⁴² UNEP (2022i). **Broad options for the structure of the international legally binding instrument on plastic pollution, including in the marine environment, taking into account paragraphs 3 and 4 of United Nations Environment Assembly resolution 5/14** (UNEP/PP/INC.1/4). Note by the Secretariat. Available at: <https://documents.un.org/doc/undoc/gen/k22/120/79/pdf/k2212079.pdf>. Accessed on 13 June 2023.

¹¹⁴³ According to Section I of the document, “each multilateral environmental agreement contains a preamble, introductory provisions, control measures, provisions related to implementation, provisions establishing treaty institutions to support implementation, provisions related to the further development of the treaty and standard administrative provisions, which are often referred to as ‘final provisions’”. 3 While the specific text of provisions of multilateral environmental agreements can vary considerably the categories themselves remain generally consistent across different agreements”.

¹¹⁴⁴ UNEP (2022i). *Ob. cit.*, p. 2-3.

¹¹⁴⁵ Punka, A.K. (2023). *Ob. cit.*, p. 70.

¹¹⁴⁶ The term “upstream” typically refers to activities associated with the extraction of raw materials (such as oil and gas) and the early stages of the plastics value chain.

¹¹⁴⁷ The term “midstream” usually refers to the stage of design, manufacture, packaging, distribution and use of plastics.

¹¹⁴⁸ The term “downstream” refers to the management of plastics at the end of their life cycle, including tasks such as segregation, collection, sorting, recycling, and disposal.

¹¹⁴⁹ For more, see note 324 *supra*. In: Farrelly, T.; *et. al.* (2021). *Ob. cit.*, p. 247.

for a less robust framework, such as a framework convention, would not be in line with these objectives.

Second, it would fail to address the urgency of the plastic pollution crisis. A framework convention would delay the implementation of necessary control measures, resulting in a fragmented framework that, while likely ratified, would lack immediate impact¹¹⁵⁰.

Third, it disregards the substantial body of work that has already been done. Unlike past instances where framework conventions were adopted, such as the Vienna Convention for the Protection of the Ozone Layer or the UNFCCC, the scientific understanding of plastic pollution and its sources is already far advanced¹¹⁵¹, with viable response options developed through initiatives like the *Ad Hoc* Open-Ended Expert Group on Marine Litter and Microplastics (AHEG)¹¹⁵².

Given these considerations, it is both appropriate and crucial to negotiate a specific convention with clear control measures integrated into the final text¹¹⁵³. In this case, the convention and annexes form an integrated whole and do not require separate adoption¹¹⁵⁴.

The UNEA mandate does not prescribe any particular structure for the “international legally binding instrument on plastic pollution”. However, it does outline certain provisions that the INC is expected to include in the treaty. For example, Paragraph 3 of Resolution 5/14 specifies provisions that would facilitate the establishment of a treaty regime, such as the objective of the treaty in letter “a”, as well as letters “g” and “h” which focus on assessing the implementation and effectiveness of the instrument in achieving the objective, specifying arrangements for assistance in letter “n”, and addressing compliance in letter “p”¹¹⁵⁵.

Paragraph 3 does not mandate the inclusion of concrete obligations and measures supporting the objective but instead calls for the “development” and “promotion” of national action plans. The parties are encouraged to “consider” obligations, as noted in Paragraph 4 of the mandate

¹¹⁵⁰ Environmental Investigation Agency (2022a). *Ob. cit.*, p. 4-5.

¹¹⁵¹ For instance, two decades of research on microplastics have uncovered their numerous sources, extensive environmental distribution, bioavailability, and impacts. This body of evidence, combined with the associated socio-political dynamics, has begun to fuel global actions. In: Thompson, R.C.; *et. al.* (2024). Twenty years of microplastic pollution research—what have we learned? *Science*, vol. 386, n. 6720, p. 7. DOI: 10.1126/science.adl2746. Available at: <https://www.science.org/doi/10.1126/science.adl2746>. Accessed on 07 December 2024.

¹¹⁵² UNEA (2022b). *Ob. cit.*, n.p.

¹¹⁵³ Environmental Investigation Agency (2022a). *Ob. cit.*, p. 4-5.

¹¹⁵⁴ Punka, A.K. (2023). *Ob. cit.*, p. 70-71.

¹¹⁵⁵ *Cfr.* p. 266, *supra*.

(...) the intergovernmental negotiating committee, in its deliberations on the instrument, is to **consider the following**:

- (a) **Obligations, measures and voluntary approaches** in supporting the **achievement of the objectives of the instrument**;
- (b) The need for a financial mechanism to support the implementation of the instrument, including the option of a dedicated multilateral fund;
- (c) Flexibility that some provisions could allow countries discretion in the implementation of their commitments, taking into account their national circumstances;
- (d) **The best available science**, traditional knowledge, knowledge of indigenous peoples and local knowledge systems;
- (e) Lessons learned and best practices, including those from informal and cooperative settings;
- (f) The possibility of a mechanism to provide policy-relevant scientific and socioeconomic information and assessment related to plastic pollution;
- (g) Efficient organization and streamlined secretariat arrangements;
- (h) Any other aspects that the intergovernmental negotiating committee may consider relevant; (...) ¹¹⁵⁶. (*author's emphasis*)

Thus, the negotiating states may choose to create a framework convention without specific measures in the framework itself, instead addressing them in subsequent protocols, for example. The mandate also indicates that the instrument “could” include “*both binding and voluntary approaches*” which opens the possibility for a specific treaty – one that includes substantive provisions within the treaty body¹¹⁵⁷.

UNEP highlights that a specific treaty model would allow for easier adaptation to changing circumstances through the amendment or adjustment of annexes or the convention body¹¹⁵⁸. The main advantage of a framework treaty, instead, would be that it can enable parties to address the issue incrementally, without needing consensus on all appropriate measures¹¹⁵⁹.

This is particularly relevant for a treaty addressing the complex issue of (marine) plastic pollution – which was expected to be concluded after just two years of negotiations, although this deadline has been slightly extended¹¹⁶⁰.

In fact, the likelihood of reaching consensus on a specific model treaty with annexes within such a short timeframe seems low¹¹⁶¹. However, empirical evidence

¹¹⁵⁶ UNEA (2022a). *Ob. cit.*, p. 3.

¹¹⁵⁷ *Cfr.* p. 280 *supra*.

¹¹⁵⁸ UNEP (2022i). *Ob. cit.*, p. 4.

¹¹⁵⁹ A framework convention structure features a less detailed set of provisions within the main treaty text. This system enables States to commit to core principles and key terms in the main text, while utilising protocols and subsequent agreements to address scientific, technical, and other related issues. In: IUCN (2023). IUCN Briefing for Negotiators – Global Plastics Treaty Inc-2 Session Legal Process of Treaty Negotiations. Available at: <https://iucn.org/sites/default/files/2023-05/legal-process-of-treaty-negotiations-final-25-may-2023.pdf>. Accessed on 12 September 2024.

¹¹⁶⁰ The second part of the fifth session (INC-5.2) is scheduled for 5-14 August 2025 at the Palais des Nations in Geneva, Switzerland. The resumed session will be preceded by regional consultations on 4 August 2025.

¹¹⁶¹ Punka, A.K. (2023). *Ob. cit.*, p. 71.

suggests that treaties structured as frameworks have generated less cooperation compared to other types of agreements¹¹⁶².

Others argue that the framework model is superior for international environmental agreements, as it can address challenges in the international legislative process, serving as a catalyst for further law-making¹¹⁶³. Nevertheless, while the framework model can help tackle fragmentation and allow parties to respond to scientific and technical developments, it may not resolve larger issues related to cooperation and political barriers¹¹⁶⁴. As UNEP stated, “*the success of framework conventions depends on the continued willingness of parties to the main convention to also adopt subsequent protocols*”¹¹⁶⁵.

Ultimately, while the architecture of the plastics treaty should be carefully considered, it is unlikely to be the decisive factor in determining the treaty’s success. The type of control measures, design elements regarding implementation, financial and technical support, and compliance are likely to be more significant¹¹⁶⁶.

The fact that the mandate calls for a “binding” instrument suggests that voluntary approaches, or legally non-binding norms, principles, or goals alone, may not suffice. This is implicit in Paragraph 3, letter “n”, where the INC is tasked with “specifying” arrangements for assistance¹¹⁶⁷ – a provision that would bind parties to certain obligations related to offering assistance¹¹⁶⁸.

Whether this obligation is substantive, or procedural remains unclear, but it would have considerable implications for how it is implemented. A substantive obligation would

¹¹⁶² Downs, G.W.; *et al.* (2000). The Transformational Model of International Regime Design: Triumph of Hope or Experience. **Columbia Journal of Transnational Law**, vol. 38, p. 465. Available at: <https://heinonline.org/HOL/LandingPage?handle=hein.journals/cjtl38&div=22&id=&page=>. Accessed on 30 April 2022.

¹¹⁶³ UNEP (2022i). *Ob. cit.*, p. 6.

¹¹⁶⁴ For instance, the climate change governance faces these barriers, having been showing signs of conflictive fragmentation. Governance structures of a conflicting nature, which fail to bring all key actors into a unified and consistent regulatory framework and include conflicting norms and principles, are likely to send mixed signals, ultimately diminishing the system’s overall effectiveness. In addition, conflictive fragmentation, where different actors pull in different directions, could complicate connections with other policy areas. The UN climate regime, thus, should also be more effectively coordinated with non-environmental institutions, particularly the WTO, to minimise conflicting fragmentation. In: Biermann, F.; *et al.* (2009). The Fragmentation of Global Governance Architectures: A Framework for Analysis. **Global Environmental Politics**, vol. 9, n. 4, p. 14-40. DOI: <https://doi.org/10.1162/glep.2009.9.4.14>. Available at: <https://direct.mit.edu/glep/article-abstract/9/4/14/14757/The-Fragmentation-of-Global-Governance?redirectedFrom=fulltext>. Accessed on 15 March 2023.

¹¹⁶⁵ UNEP (2022i). *Ob. cit.*, p. 6.

¹¹⁶⁶ Punka, A.K. (2023). *Ob. cit.*, p. 72.

¹¹⁶⁷ *Cfr.* p. 266, *supra*.

¹¹⁶⁸ Stöfen-O’Brien, A. (2022). Current Legal Developments United Nations Environment Programme. **The International Journal of Marine and Coastal Law**, vol. 37, p. 727-740. Available at: https://brill.com/view/journals/estu/37/4/article-p727_5.xml. Accessed on 12 January 2023.

require a specific goal or target for the level of assistance to be provided, clarifying what is expected of states both offering and receiving assistance. A procedural obligation, in turn, could involve reporting on projected levels of finance or technology support/transfer, or detailing the support provided over a set period. In this case, the obligation would not be tied to the actual provision of funds¹¹⁶⁹.

It is clear that a treaty with only non-binding norms, goals, and objectives would not align with the mandate. However, vague commitments to provide assistance, without further action or facilitation, could risk turning into empty promises¹¹⁷⁰. The same applies to other provisions with ambiguous language that might undermine the perceived legal binding nature of the treaty, such as phrases like “*as appropriate*” or “*as long as possible*”¹¹⁷¹.

- *Objectives*

The objective of a treaty is a crucial factor to consider, as it significantly determines the mandate and scope of the agreement. It also serves as a guide for interpreting the treaty, as outlined in Article 31 of the VCLT, which presents general rules on interpretation for a treaty, as it

(...) **shall be interpreted in good faith** in accordance with the ordinary meaning to be given to the terms of the treaty in their context and in the light of its object and purpose.

2. The context for the purpose of the interpretation of a treaty shall comprise, **in addition to the text, including its preamble and annexes:**

- (a) any agreement relating to the treaty which was made between all the parties in connection with the conclusion of the treaty;
- (b) any instrument which was made by one or more parties in connection with the conclusion of the treaty and accepted by the other parties as an instrument related to the treaty.

3. There shall be taken into account, together with the context:

¹¹⁶⁹ In any case, the treaty should establish an effective financial and technical assistance mechanism, which should allocate funds and facilitate capacity-building, technical assistance, and technology transfer to developing countries, enabling them to implement the treaty. This support, for instance, could focus on improving waste collection and recycling infrastructures, thus eliminating the need for harmful practices like plastic incineration. The need for financial and technical assistance was emphasised by Colombian lawyer Monica de Greiff Lindo, speaking on behalf of the G77 and China at UNEA 5.2. She stressed that developing nations must receive this support from developed countries in order to transition to sustainable consumption and production systems. In: Nagtzaam, G.; *et. al.* (2023). *Ob. cit.*, p. 280.

¹¹⁷⁰ Environmental Investigation Agency (2022b). Convention on Plastic Pollution Essential Elements: Financial Aspects. Available at: <https://eia-international.org/wp-content/uploads/EIA-Essential-Elements-Finance-SINGLES.pdf>. Accessed on 07 May 2023.

¹¹⁷¹ As it is seen in Resolution 5/14, Paragraph 3, letter “f” and in the preamble “Underlining the importance of promoting sustainable design of products and materials so that they can be reused, remanufactured or recycled and therefore retained in the economy for as long as possible, along with the resources they are made of, and of minimizing the generation of waste, which can significantly contribute to sustainable production and consumption of plastics, (...)”.

- (a) any **subsequent agreement** between the parties regarding the interpretation of the treaty or the application of its provisions;
- (b) any **subsequent practice in the application of the treaty** which establishes the agreement of the parties regarding its interpretation;
- (c) any **relevant rules of international law** applicable in the relations between the parties.

4. A special meaning shall be given to a term if **it is established that the parties so intended**¹¹⁷². (*author's emphasis*)

Some treaties include an article specifically outlining the objective(s) of the instrument, while others lack such provisions, with the objective being implicitly inferred from the preamble. The UNEA mandate outlines that the INC is to “*specify the objectives of the instrument*”, which suggests that the plastics treaty will likely include a specific provision focused on the (possibly multiple) objectives¹¹⁷³.

The Resolution 5/14 does not provide guidance on what these objectives might be, although some direction can be inferred from the mandate's wording, which states that the INC is to develop an international LBI “*on plastic pollution, including in the marine environment*” and that it should be “*based on a comprehensive approach that addresses the full life cycle of plastic*”¹¹⁷⁴.

The mandate also emphasises the need for immediate action

(...) towards the **long-term elimination of plastic pollution in marine and other environments**, and to **avoid detriment from plastic pollution** to ecosystems and the human activities dependent on them, (...) ¹¹⁷⁵. (*author's emphasis*)

It is crucial that the objective of the new treaty is broad enough to address the issue of plastic pollution comprehensively, yet not so broad that it risks losing legitimacy among states¹¹⁷⁶.

A vague, overly broad objective may leave parties uncertain about their responsibilities and could imply an excessive loss of sovereignty for states considering participation. While the control measures will define the specific expectations for the

¹¹⁷² UN (2005a). *Ob. cit.*, p. 12-13.

¹¹⁷³ In this regard, in the pre-session submissions for INC-2, six distinct objectives proposed across 68 contributions were identified: Objective 1 - End plastic pollution; Objective 2 - Reduce production; Objective 3 - Benefits of plastics; Objective 4 - Protect human health; Objective 5 - Protect biodiversity and (marine) environment; and Objective 6 - Address the full life cycle. In: Dreyer, E.; *et. al.* (2024). **Towards a Global Plastics Treaty**: Tracing the UN Negotiations. Lund University. Lund, Sweden, p. 13. ISBN: 978-91-7895-993-8. Available at: https://portal.research.lu.se/files/173635177/Dreyer_et_al._2024_-_Towards_a_Global_Plastics_Treaty_-_Tracing_the_UN_negotiations.pdf. Accessed on 30 December 2024.

¹¹⁷⁴ UNEA (2022a). *Ob. cit.*, p. 2-3.

¹¹⁷⁵ UNEA (2022a). *Ob. cit.*, p. 1.

¹¹⁷⁶ Dreyer, E.; *et. al.* (2024). *Ob. cit.*, p. 9.

parties¹¹⁷⁷, the objective should be clear and realistic to avoid any ambiguity regarding the collective goal agreed upon. However, it should not be so narrowly defined that it restricts the treaty's scope or limits its potential for evolution¹¹⁷⁸.

A working document by the INC suggests three potential options for the objective of the instrument

The committee may wish to consider using one, or a combination, of the following statements of objective of the instrument:

(a) **End plastic pollution**; protect human health and the environment from its adverse effects throughout the life cycle of plastic.

(b) **Protect human health and the environment** from the adverse effects of plastic pollution throughout the life cycle.

(c) **Reduce the production, use and discharge of plastics across their life cycle**, including through the promotion of a **circular plastics economy** with a view to ending plastic pollution by X year and protecting human health and the environment from its adverse effects¹¹⁷⁹. (*author's emphasis*)

All of these suggestions are relatively concrete – though the final objective would likely benefit from incorporating elements of each. Alternative “a” sets a very specific long-term goal of ending plastic pollution, giving the treaty a broad enough scope to implement a variety of measures – a feature lacking in suggestion “b”. Alternative “c” also presents the long-term goal of ending plastic pollution, but adds a deadline for achieving this goal, which further solidifies the objective and may create a sense of urgency¹¹⁸⁰.

An interest differentiation is the language used, which is somewhat weaker: “*with a view to ending plastic pollution*” rather than stating the goal as “*to end plastic pollution by X year*”¹¹⁸¹. Including a date in the objective of the treaty, however, could pose issues,

¹¹⁷⁷ Control measures should focus on addressing each stage of the full lifecycle of plastics in sequence, specifically: i) raw materials (sourcing), including oil and gas extraction, processing, and petrochemical production, which account for 90% of the GHG emissions related to plastics; ii) polymer production and consumption (upstream); iii) product design and use (midstream); iv) waste management and treatment (downstream); and v) plastic in the environment (leakage), which would involve actions to remediate existing plastic pollution, particularly in marine environments, focusing on minimising impacts on local communities, biodiversity hotspots, fisheries and food security, tourism, and navigational safety. In: Environmental Investigation Agency (2022a). *Ob. cit.*, p. 5.

¹¹⁷⁸ Dreyer, E.; *et. al.* (2024). *Ob. cit.*, p. 9.

¹¹⁷⁹ UNEP (2023g). Potential options for elements towards an international legally binding instrument, based on a comprehensive approach that addresses the full life cycle of plastics as called for by United Nations Environment Assembly resolution 5/14. Note by the Secretariat, p. 4. Available at: <https://wedocs.unep.org/xmlui/bitstream/handle/20.500.11822/42190/UNEP-PP-INC.2-4%20English.pdf?sequence=13&isAllowed=y>. Accessed on 12 June 2023.

¹¹⁸⁰ Dreyer, E.; *et. al.* (2024). *Ob. cit.*, p. 13.

¹¹⁸¹ In this regard, it should be noted that the United Kingdom stated that “*the instrument should contain a time-bound commitment to ending plastic pollution*”. Similarly, Japan noted that “*we need to set a global common goal to reduce additional plastic pollution particularly in the marine environment to zero by a*

as it would need to be amended if the goals are not achieved. For that, it could be better to specifying dates only in the annexes, which could be amended through a more straightforward procedure¹¹⁸².

Additionally, suggestion “c” emphasises the reduction of “*production, use, and discharge of plastics across their lifecycle*” as the primary objective, with the goal of ending plastic pollution positioned as a consequence, rather than the main goal¹¹⁸³.

Later, these three options for the objectives were refined into two, in the Revised draft text of the future LBI

Option 1

1. The objective of this instrument is to end plastic pollution, including in the marine environment [and other aquatic as well as terrestrial ecosystems], [based on a comprehensive approach that addresses the full life cycle of plastic]¹¹⁸⁴ [through the prevention, progressive reduction and elimination of [additional] plastic pollution] [by 2040] [and enhanced efforts thereafter], [in order] to protect human health and the environment [from its adverse effects] [and to achieve sustainable development].

Option 2

2. The objective of this instrument is to protect human health and the environment from [the adverse effects of] plastic pollution, including in the marine environment [and other aquatic as well as terrestrial ecosystems], [by ending plastic pollution based on a comprehensive approach that addresses the full life cycle of plastic] [through the prevention, progressive reduction and remediation of [additional] plastic pollution] [management] [and utilization of plastic and plastic waste] [according to national priorities] [by 2040] [and enhanced efforts thereafter], [and to achieve sustainable development][, poverty eradication and just transition,] [considering the principle of common but differentiated responsibilities and respective capabilities] [as well as financial and technical support]¹¹⁸⁵.

Both of these options are viable, but Option 2 is considered as more suitable, as it emphasises the protection of human health and the environment, which serves as the core reason for negotiating and adopting this instrument¹¹⁸⁶.

certain year”. The 4 submissions that proposed a specific year – Iceland (“*goal of ending plastic pollution by 2040*”), Monaco (“*to end plastic pollution (by 2040 at latest)*”), Morocco (“*Eliminate plastic pollution by 2040*”), and the HAC (“*our common ambition to end plastic pollution by 2040*”) – recommended the year 2040. In: UNEP (2023h). Second Session (INC-2): Pre-session submissions. Available at: <https://www.unep.org/inc-plastic-pollution/session-2/submissions#Members>. Accessed on 18 January 2024.

¹¹⁸² Center for International Environmental Law (2024a). Analysis of the Revised Zero Draft of the Plastics Treaty. Available at: https://www.ciel.org/wp-content/uploads/2024/03/Annotated_Zero_Draft_INC4.pdf. Accessed on 05 April 2024.

¹¹⁸³ Punka, A.K. (2023). *Ob. cit.*, p. 74.

¹¹⁸⁴ Note that the square brackets are used around text that has been drafted but remains subject to further debate – they highlight the parts of the text that still need additional discussion. They signify language that may either be kept or removed based on the outcome of negotiations.

¹¹⁸⁵ UNEP (2023i). Revised draft text of the international legally binding instrument on plastic pollution, including in the marine environment. Note by the secretariat, p. 6-7 (UNEP/PP/INC.4/3). Available at: <https://wedocs.unep.org/bitstream/handle/20.500.11822/44526/RevisedZeroDraftText.pdf>. Accessed on 11 January 2024.

¹¹⁸⁶ Center for International Environmental Law (2024a). *Ob. cit.*, p. 10.

In general, the treaty would likely benefit from a clear long-term goal, such as ending plastic pollution by a specific year, as the primary objective, followed by partial goals and actions, such as reducing plastic production, use, and discharge across its lifecycle. The language adopted, however, should not restrict the parties to these actions and partial goals to allow for the potential evolution of a dynamic treaty¹¹⁸⁷.

- *National Action Plans*

Moving forward, the Resolution 5/14 places significant emphasis on National Action Plans (NAPs) as a central element of the new treaty by

Recognizing that **each country is best positioned to understand its own national circumstances**, including its stakeholder activities, related to addressing plastic pollution, including in the marine environment, (...)

Decides that the intergovernmental negotiating committee is to develop an international legally binding instrument on plastic pollution, including in the marine environment, (...) which could include (...) provisions:

(...) (c) To **promote national action plans** to work towards the prevention, reduction and elimination of plastic pollution, and to support regional and international cooperation; (...)

Calls upon all Member States to continue and step up activities, and adopt voluntary measures, to combat plastic pollution, including measures related to sustainable consumption and production, which may include circular economy approaches, and **to develop and implement national action plans**, while fostering international action and initiatives under national regulatory frameworks, and, on a voluntary basis, to provide statistical information on the environmentally sound management of plastic waste, as appropriate, taking into account national circumstances; (...) ¹¹⁸⁸. (*author's emphasis*)

This wording suggests that the instrument may adopt a bottom-up approach, where the objective is defined, but the methods for achieving it are left to the contributions that the Parties choose to propose¹¹⁸⁹.

While this mechanism emphasises the domestic aspect of addressing the issue, NAPs do not necessarily indicate a treaty that leaves Parties to determine their own methods for achieving the overall objective. A treaty could establish a mechanism that binds Parties to their respective NAPs in order to fulfil international, regional, or national obligations and commitments related to that specific policy area or issue¹¹⁹⁰.

¹¹⁸⁷ Punka, A.K. (2023). *Ob. cit.*, p. 74.

¹¹⁸⁸ UNEA (2022a). *Ob. cit.*, p. 2-4.

¹¹⁸⁹ Environmental Investigation Agency (2022a). *Ob. cit.*, p. 3.

¹¹⁹⁰ March, A.; *et. al.* (2024). National Action Plans: Effectiveness and requirements for the Global Plastics Treaty. **Cambridge Prisms: Plastics**, vol. 2, e11, p. 2. DOI: <https://doi.org/10.1017/plc.2024.11>. Available at: <https://www.cambridge.org/core/journals/cambridge-prisms-plastics/article/national-action-plans-effectiveness-and-requirements-for-the-global-plastics-treaty/E1948E36233B8E0BBB6CE1CCB80061C9>. Accessed on 19 November 2024.

The downside of this approach, nevertheless, is that Parties might be overly cautious in setting ambitious goals, opting for modest targets and actions¹¹⁹¹.

Despite that, NAPs are frequently used in many Multilateral Environmental Agreements (MEAs). They are typically described in broad terms within the agreement, with detailed guidance on their development – both in terms of content and process – provided at a later stage. It is interesting, thus, to draw a parallel with other MEAs and their NAPs¹¹⁹².

In this context, Article 4, Paragraph 2 of the Paris Agreement requires each Party to

prepare, communicate and maintain successive **nationally determined contributions that it intends to achieve**. Parties shall pursue **domestic mitigation measures, with the aim of achieving the objectives** of such contributions.¹¹⁹³ (*author's emphasis*)

The NAPs of the Paris Agreement, or the Nationally Determined Contributions (NDCs), are central to it, representing each country's efforts to reduce national emissions and adapt to climate change impacts. Similarly, an important aspect of the future Global Plastics Treaty will be country-specific NAPs that align with international obligations, detailing the policies and measures needed to prevent and reduce plastic pollution. These plans will be tailored to the national context, reflecting local realities and challenges¹¹⁹⁴.

There is, however, a significant risk that relying too heavily on the NDC approach established under the Paris Agreement could result in inefficiency and ineffectiveness – as the current non-binding nature of NAPs significantly weakens their effectiveness, as they often depend on voluntary commitments and lack enforcement mechanisms to ensure compliance¹¹⁹⁵.

Additionally, the lack of international coordination on key obligations upstream weakens national efforts. Therefore, the NAP framework within the plastics treaty would need to learn from the limitations of the Paris Agreement's NDC approach and seek to find a balance between national actions and internationally applied core obligations, especially in upstream and midstream areas¹¹⁹⁶.

¹¹⁹¹ Punka, A.K. (2023). *Ob. cit.*, p. 75.

¹¹⁹² Raubenheimer, K.; Urho, N. (2020). Possible elements of a new global agreement to prevent plastic pollution. Nordic Council of Ministers, Denmark, Copenhagen, p. 66. Available at: <http://norden.diva-portal.org/smash/get/diva2:1477124/FULLTEXT02.pdf>. Accessed on 12 November 2024.

¹¹⁹³ UN (2015c). **Paris Agreement**. Adopted on 12 December 2015. Entry into force on 4 November 2016. Available at: https://unfccc.int/sites/default/files/english_paris_agreement.pdf. Accessed on 07 November 2023.

¹¹⁹⁴ Environmental Investigation Agency (2022a). *Ob. cit.*, p. 3.

¹¹⁹⁵ March, A.; *et. al.* (2024). *Ob. cit.*, p. 2.

¹¹⁹⁶ Environmental Investigation Agency (2022a). *Ob. cit.*, p. 3.

Other experiences have also shown that granting Parties significant flexibility in developing NAPs may come at the cost of comparability. For example, the CBD requires its Parties to create National Biodiversity Strategy and Action Plans (NBSAPs) based on the flexible Aichi Biodiversity Targets¹¹⁹⁷, in accordance with its Article 6

Each Contracting Party shall, in accordance with its particular conditions and capabilities:

(a) **Develop national strategies, plans or programmes for the conservation and sustainable use of biological diversity** or adapt for this purpose existing strategies, plans or programmes which shall reflect, inter alia, the measures set out in this Convention relevant to the Contracting Party concerned; and

(b) Integrate, as far as possible and **as appropriate**, the conservation and sustainable use of biological diversity into relevant sectoral or cross-sectoral plans, programmes and policies.¹¹⁹⁸ (*author's emphasis*)

Although the flexibility to establish national targets has allowed parties to consider their unique priorities and capacities, it has resulted in varying targets within the NBSAPs, which undermines comparability. Crucially, parties are encouraged to include the full spectrum of activities from all biodiversity-related conventions in their NBSAPs, aiding in the alignment of convention activities with shared objectives¹¹⁹⁹.

In contrast, the new Kunming-Montreal Global Biodiversity Framework requires Parties to revise and update their NBSAPs – as in Decision 15/6, where the 15th meeting of the COP to the CBD

6. *Requests* Parties to **revise and update their national biodiversity strategies and action plans in accordance with Article 6 of the Convention**, following the guidance provided in annex I to the present decision, aligned with the Kunming-Montreal Global Biodiversity Framework and its goals and targets, including those related to means of implementation, and to submit them through the clearing-house mechanism by the sixteenth meeting of the Conference of the Parties;

7. *Requests* Parties not in a position to submit their revised national biodiversity strategies and action plans by the sixteenth meeting of the Conference of the Parties to communicate national targets **reflecting, as applicable, all the goals and targets of the Kunming-Montreal Global Biodiversity Framework, including those related to all means of implementation**, in accordance with the reporting template provided in annex I, as a standalone submission, by the sixteenth meeting of the Conference of the Parties, in advance of the full submission of the national biodiversity strategy and action plan; (...) ¹²⁰⁰ (*author's emphasis*)

¹¹⁹⁷ CBD (2011). NBSAP training modules version 2.1 – Module 1. An Introduction to National Biodiversity Strategies and Action Plans. Montreal, June 2011. Available at: <https://www.cbd.int/doc/training/nbsap/b1-train-intro-nbsap-revised-en.pdf>. Accessed on 11 September 2023.

¹¹⁹⁸ UNEP (2011a). *Ob. cit.*, p. 6.

¹¹⁹⁹ Raubenheimer, K.; Urho, N. (2020). *Ob. cit.*, p. 66-67.

¹²⁰⁰ UNEP (2022j). 15/6. Mechanisms for planning, monitoring, reporting and review. Conference of the Parties to the Convention on Biological Diversity Fifteenth meeting – Part II Montreal, Canada, 7-19

This approach represents a step toward standardising national reports, although verification methods remain incomplete¹²⁰¹. In general, without clear guidelines for designing plans and coordinating measurement units and methods, it becomes challenging to compare and summarise the plans effectively, making it difficult to assess overall action and progress¹²⁰².

Still, if supported by specific overall objectives, targets, and mechanisms for accountability, NAPs could become a key and robust element of the plastics treaty. Several countries have already developed and begun implementing NAPs for managing plastic pollution using various approaches, but coordination is crucial for these plans to contribute effectively to the collective goal of addressing plastic pollution through a circular approach¹²⁰³.

In this sense, it is interesting pointing out that many countries have supported the implementation of NAPs within the future treaty. For instance, Japan considers that

(...) The following illustrative effective **measures for plastic circularity and its leakage prevention must be reflected in National Action Plans** which covers measures at every stage of plastic lifecycle, with a **concrete roadmap on the measures to attain the global goal until a target year by strengthening Members' efforts over time**, according to national circumstances. (...)

The National Action Plans should **include targets, actions and relevant indicators in the medium term as well as long-term strategies** towards the realization of the global goal and objectives of the instrument. (...)

National Action Plans will constitute the most essential part of the instrument particularly with regard to **accelerating country-driven actions to end plastic pollution**, in addition to monitoring and evaluating implementation and progress. (...)

Ensuring transparent assessment of progress by Members, visualization of implementation should be **realized by using objective data and its evidence on measures in National Action Plan**.¹²⁰⁴ (*author's emphasis*)

December 2022 (CBD/COP/DEC/15/6). Available at: <https://www.cbd.int/doc/decisions/cop-15/cop-15-dec-06-en.pdf>. Accessed on 13 September 2023.

¹²⁰¹ Punka, A.K. (2023). *Ob. cit.*, p. 75.

¹²⁰² Raubenheimer, K.; Urho, N. (2020). *Ob. cit.*, p. 70.

¹²⁰³ Punka, A.K. (2023). *Ob. cit.*, p. 75.

¹²⁰⁴ UNEP (2022k). Japan submission for potential options for elements towards an international legally binding instrument, based on a comprehensive approach that addresses the full life cycle of plastics. Call for written submissions – Proposed response template on the potential options for elements towards an international legally binding instrument. Proposed response template (16 December 2022) / INC on Plastic Pollution. Available at: <https://wedocs.unep.org/bitstream/handle/20.500.11822/41794/Japansubmission.pdf?sequence=1&isAllowed=y>. Accessed on 12 September 2023.

Although Resolution 5/14 is not legally binding, NAPs are likely to play a key role in the future Global Plastics Treaty, as they can serve as a valuable tool for Parties to assess their progress on the issue, their capabilities, and their priorities – in fact, progression should be a central principle, allowing action plans to serve as a “living document” that evolves to reflect increasing ambition and progress over time¹²⁰⁵.

NAPs could also be integrated with other management approaches. By combining NAPs, whether binding or not, with other mechanisms and control measures, the treaty could effectively address the issue at hand while allowing for some autonomy for the Parties¹²⁰⁶.

For example, the mechanism of NAPs could be paired with collective goals or targets, using incentive mechanisms to encourage states to meet them. This approach provides flexibility¹²⁰⁷ for actors to choose how to achieve the targets and do so efficiently, maximising benefits and minimising costs¹²⁰⁸.

A further departure from a top-down model would be to frame the goals in broader terms, such as implementing sound waste management or mandatory technical standards for the design and recyclability of plastics, or even a more flexible goal of eliminating plastic waste flows into the environment, with concrete measures left to the discretion of the Parties¹²⁰⁹. This could involve offering a set of regulatory options, similar to the approach of the Minamata Convention on Mercury¹²¹⁰.

Another approach might involve negotiating differentiated goals and targets – although this could prove challenging for states to agree upon¹²¹¹.

In summary, what matters most, considering the discussed topics, is that it is taken into account that: i) NAP-based approaches backed by strong national legal and institutional frameworks are more likely to be effective; ii) approaches with strict compliance measures tend to improve the likelihood of achieving national commitments; iii) NAP-based strategies should include comprehensive monitoring, evaluation,

¹²⁰⁵ This will ensure that the targets and measures set by countries build on each other in successive plans. Achieving this requires strong political support for more ambitious actions. In: Raubenheimer, K.; Urho, N. (2020). *Ob. cit.*, p. 70.

¹²⁰⁶ March, A.; *et. al.* (2024). *Ob. cit.*, p. 7.

¹²⁰⁷ This level of flexibility can make it more challenging to establish consistent international baselines, create uniform monitoring metrics across NAP-based approaches, and assess progress on a global scale.

¹²⁰⁸ Environmental Investigation Agency (2022a). *Ob. cit.*, p. 3.

¹²⁰⁹ Simon, N.; *et. al.* (2021). *Ob. cit.*, p. 45.

¹²¹⁰ UNEP (2024d). **Minamata Convention on Mercury** (Text and Annexes) – 2024 Edition. Adopted on 10 October 2013. Entry into force on 16 August 2017. Available at: <https://minamataconvention.org/sites/default/files/documents/2024-10/Minamata-Convention-booklet-Oct2024-EN.pdf>. Accessed on 13 October 2024.

¹²¹¹ Punka, A.K. (2023). *Ob. cit.*, p. 76.

reporting, and data sharing systems, as full transparency and disclosure are essential for ensuring accountability; iv) regular updates to NAP-based approaches will allow for the integration of new knowledge and adjustments based on policy successes or shortcomings; v) NAPs require both technical and financial support to ensure proper implementation and compliance; and vi) clear national targets and implementation measures aligned with the Treaty should also be central to NAP-based approaches¹²¹².

- *Principles*

Principles are undoubtedly important to guide the application of legal instruments¹²¹³ – as they can provide context for interpreting the scheme to ensure effective implementation¹²¹⁴ – and Resolution 5/14 references the principles outlined in the 1992 Rio Declaration, reaffirming them and calling for the future LBI on plastic pollution to “*take into account*” both the principles and the “*national circumstances and capabilities*” of the Parties¹²¹⁵.

The Rio Declaration has had great impact on international environmental law, providing the fundamental principles of what would be a “law of sustainable development”. It serves as a crossroads where various historical trends converge and are expressed¹²¹⁶.

The 1992 Declaration is seen as a synthesis of principles, incorporating some that existed prior to its adoption. It has undeniable “normative impact” – referring to the influence its principles have in shaping subsequent instruments, primarily treaties¹²¹⁷ – and continues to resonate to this day, as seen in instances like its invocation in Resolution 5/14¹²¹⁸.

¹²¹² March, A.; *et. al.* (2024). *Ob. cit.*, p. 11-12.

¹²¹³ UNEP (2022). Potential elements, based on provisions in paragraphs 3 and 4 of United Nations Environment Assembly resolution 5/14, including key concepts, procedures and mechanisms of legally binding multilateral agreements that may be relevant to furthering implementation and compliance under the future international legally binding instrument on plastic pollution, including in the marine environment. Note by the secretariat, p. 4. (UNEP/PP/INC.1/5). Available at: https://wedocs.unep.org/bitstream/handle/20.500.11822/41269/Potential_Elements_E.pdf. Accessed on 20 October 2022.

¹²¹⁴ Kohen, M.G. (1997). *Le rôle des principes fondamentaux du droit international*. In: **Possession contestée et souveraineté territoriale**. Genève: Graduate Institute Publications, p. 367-424. ISBN 978-2-940549-20-7.

¹²¹⁵ UNEA (2022a). *Ob. cit.*, p. 2-3.

¹²¹⁶ Boon, K. (1992). The Rio Declaration and its Influence on International Environmental Law. **Singapore Journal of Legal Studies**, p. 347-364. Available at: <https://www.jstor.org/stable/24866183>. Accessed on 13 March 2022.

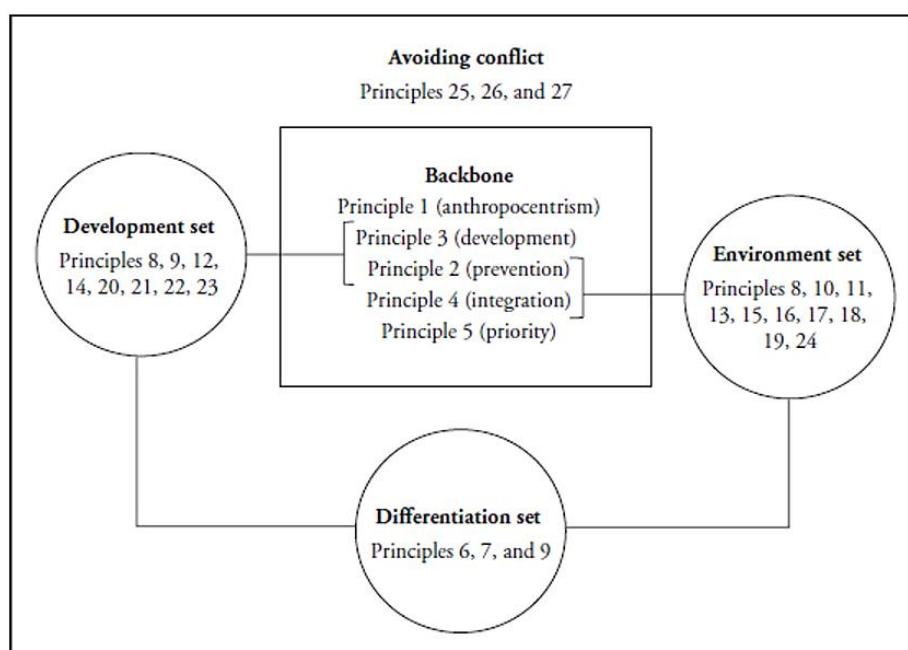
¹²¹⁷ Viñuales, J.E. (2015). The Rio Declaration on Environment and Development: Preliminary Study. In: **The Rio Declaration on Environment and Development: A Commentary**. Oxford Commentaries on International Law, Viñuales, J.E. (ed.). Oxford, United Kingdom: Oxford University Press, p. 90. ISBN 9780199686773.

¹²¹⁸ UNEA (2022a). *Ob. cit.*, p. 2-3.

It stands as the only international instrument adopted by consensus that unites most of the foundational principles of international environmental law (the “environment set”) with a developmental perspective (the “development set”), aiming to reconcile them with socio-economic development. Crucially, the environment and development sets are harmonised through a set of principles (the “differentiation set”), which are now recognised as a fair compromise¹²¹⁹. This balance is situated within the broader framework of peace and conflict resolution as outlined in the United Nations Charter¹²²⁰.

In this sense, Figure 36 provides a panorama of the Rio Declaration’s structure:

Figure 36 – The architecture of the Rio Declaration¹²²¹



Source: Viñuales, J.E. (2015). The Rio Declaration on Environment and Development: Preliminary Study. In: **The Rio Declaration on Environment and Development: A Commentary**. Oxford Commentaries on International Law, Viñuales, J.E. (ed.). Oxford, United Kingdom: Oxford University Press.

¹²¹⁹ Viñuales, J.E. (2015). *Ob. cit.*, p. 139.

¹²²⁰ UN (1945). *Ob. cit.*, n.p.

¹²²¹ This architecture is valuable because: i) it clarifies the scope of environmental principles within the declaration; ii) it distinguishes principles focused primarily on economic and social development, which also link to the international law of development that emerged in the 1970s and 1980s, as well as to other areas of international law (such as international economic law, human rights, and humanitarian law); iii) it highlights the central role of differentiation principles in bridging the development and environmental sets; and iv) it emphasises the role of the prevention principle within the “backbone” of the declaration, serving as the link between the right to development and the requirement for integration. In: Viñuales, J.E. (2015). *Ob. cit.*, p. 91.

As it is perceived in the Figure above, the Rio Declaration contains 27 principles, emphasising the interconnection between humanity and the Earth. Importantly, many of them relate to the crisis of (marine) plastic pollution, such as

Principle 2 – States have, in accordance with the Charter of the United Nations and the principles of international law, the sovereign right to exploit their own resources pursuant to their own environmental and developmental policies, and the **responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other States or of areas beyond the limits of national jurisdiction.**

Principle 7 – States shall cooperate in a spirit of global partnership to **conserve, protect and restore the health and integrity of the Earth’s ecosystem.** In view of the **different contributions to global environmental degradation**, States have **common but differentiated responsibilities.** The developed countries acknowledge the responsibility that they bear in the international pursuit of sustainable development in view of the pressures their societies place on the global environment and of the technologies and financial resources they command.

Principle 8 – To achieve **sustainable development and a higher quality of life for all people**, States should **reduce and eliminate unsustainable patterns of production and consumption** and promote appropriate demographic policies.

Principle 15 – In order to protect the environment, **the precautionary approach shall be widely applied by States according to their capabilities.** Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation.

Principle 16 – National authorities should endeavour to promote the internalization of environmental costs and the use of economic instruments, taking into account **the approach that the polluter should, in principle, bear the cost of pollution**, with due regard to the public interest and without distorting international trade and investment.¹²²² (*author’s emphasis*)

Although the Rio Declaration and its principles are not legally binding, they serve as guidance for future legal developments. The inclusion of the Rio Principles in the Resolution 5/14 was a natural choice, especially considering that plastic pollution results from human activity and shares many parallels with economic development¹²²³.

The principles outlined could be fundamental to guide Parties in the measures taken to achieve the objective of the future LBI and implement its provisions¹²²⁴.

¹²²² UNGA (1992). *Ob. cit.*, p. 1-4.

¹²²³ Punka, A.K. (2023). *Ob. cit.*, p. 80.

¹²²⁴ Centre International de Droit Comparé de l’Environnement (2023). *Propositions du CIDCE*. Deuxième session du Comité intergouvernemental de négociation chargé d’élaborer un instrument international juridiquement contraignant sur la pollution plastique, y compris dans le milieu marin (Paris, 29 mai - 2 juin 2023). Available at: <https://cidce.org/fr/plastiques/>. Accessed on 30 June 2023.

First, the Principle 2, or the principle of prevention, which is, in many respects, the core principle of the Rio Declaration¹²²⁵. Not only does it reaffirm the continuity with the Stockholm Declaration (with Principle 21 being nearly identical in wording)¹²²⁶, but it also links the development and environmental frameworks that form the foundation of the Rio Declaration. This connection is evident in the wording of Principle 2 (*supra*).

This principle is also enshrined in the Preamble of the CBD, where the Contracting Parties note “*that it is vital to anticipate, prevent and attack the causes of significant reduction or loss of biological diversity at source,*”¹²²⁷.

The Convention on the Protection and Use of Transboundary Watercourses and International Lakes has also adopted this principle in its Preamble and Articles 2 and 3

Emphasizing the **need for strengthened national and international measures to prevent**, control and reduce the release of hazardous substances into the aquatic environment and to abate eutrophication and acidification, as well as pollution of the marine environment, in particular coastal areas, from land-based sources, (...)

Article 2 – General Provisions.

1. The Parties shall take all appropriate **measures to prevent**, control and reduce any transboundary impact. (...)

Article 3 – Prevention, Control and Reduction.

1. **To prevent, control and reduce transboundary impact**, the Parties shall develop, adopt, implement and, as far as possible, render compatible relevant legal, administrative, economic, financial and technical measures, in order to ensure, inter alia, that:

(a) **The emission of pollutants is prevented**, controlled and reduced at source through the application of, inter alia, low- and non-waste technology» (...) ¹²²⁸. (*author’s emphasis*)

The same is observed in the Convention on International Watercourses for Non-Navigational Purposes, in its Article 21

(...) 2. **Watercourse States shall**, individually and, where appropriate, jointly, **prevent, reduce and control the pollution of an international watercourse that may cause significant harm to other watercourse States or to their environment**, including harm to human health or safety, to the use of the waters for any beneficial purpose or to the living resources of the

¹²²⁵ Duvic-Paoli, L.A.; Viñuales, J.E. (2015). Principle 2: Prevention. In: **The Rio Declaration on Environment and Development: A Commentary**. Oxford Commentaries on International Law, Viñuales, J.E. (ed.). Oxford, United Kingdom: Oxford University Press. ISBN 9780199686773.

¹²²⁶ Stockholm Declaration, Principle 21 “States have, in accordance with the Charter of the United Nations and the principles of international law, the sovereign right to exploit their own resources pursuant to their own environmental policies, and the responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other States or of areas beyond the limits of national jurisdiction.” In: UN (1972b). **Declaration of the United Nations Conference on the Human Environment**. Stockholm, 5 to 16 June 1972. Available at: https://www.ipcc.ch/apps/nj-lite/srex/nj-lite_download.php?id=6471. Accessed on 02 April 2023.

¹²²⁷ For more, see *supra* p. 89. In: UNEP (2011a). *Ob. cit.*, p. 2.

¹²²⁸ UNECE (2014). *Ob. cit.*, p. 1-4.

watercourse. Watercourse States shall take steps to harmonize their policies in this connection.

3. Watercourse States shall, at the request of any of them, **consult with a view to arriving at mutually agreeable measures and methods to prevent, reduce and control pollution** of an international watercourse, (...).¹²²⁹ (*author's emphasis*)

Additionally, a key aspect of UNCLOS is the inclusion of a whole section (Part XII) dedicated to the protection and preservation of the marine environment. Part XII is grounded in the principle of prevention, with its elements outlined in Articles 193 (sovereignty over natural resources) and 194 (limitations on such sovereignty to safeguard the environment)

Article 193 – Sovereign right of States to exploit their natural resources.
States have the sovereign right to exploit their natural resources pursuant to their environmental policies and in accordance with their **duty to protect and preserve the marine environment**.

Article 194 – **Measures to prevent, reduce and control pollution of the marine environment.**

1. States shall take, individually or jointly as appropriate, all measures consistent with this Convention that are **necessary to prevent**, reduce and control pollution of the marine environment from any source, using for this purpose the best practicable means at their disposal and in accordance with their capabilities, and they shall endeavour to harmonize their policies in this connection.

2. States shall take all measures necessary to ensure that activities under their jurisdiction or control are so conducted as not to cause damage by pollution to other States and their environment, and that pollution arising from incidents or activities under their jurisdiction or control does not spread beyond the areas where they exercise sovereign rights in accordance with this Convention.
(...)¹²³⁰ (*author's emphasis*)

The prevention principle is firmly established as a customary norm of international law. Beyond the Stockholm and Rio Declarations, this norm is reflected in numerous environmental treaties and major codification efforts led by entities such as the ILC, the Commission on Sustainable Development, the *Institut de Droit International*, and the International Law Association. There is also broad consensus among scholars regarding the customary status of the prevention principle¹²³¹.

In sequence, Principle 7 is another very relevant principle when it comes to (marine) plastic pollution. It has solidified the provisions in earlier agreements that promoted universal participation by offering incentives, such as differentiated standards,

¹²²⁹ UN (2014). *Ob. cit.*, p. 9.

¹²³⁰ UN (1982a). *Ob. cit.*, p. 100.

¹²³¹ Duvic-Paoli, L.A.; Viñuales, J.E. (2015). *Ob. cit.*, p. 232-235.

“grace periods”, and financial support to cover some of the additional costs associated with meeting treaty obligations¹²³².

The principle of “common but differentiated responsibilities” combines with cooperation, as developed countries must support the capacity building of other countries through knowledge and technology transfers, as stated in the UNFCCC

Article 3 – Principles.

In their actions to achieve the objective of the Convention and to implement its provisions, the Parties shall be guided, inter alia, by the following:

1. The Parties should **protect the climate system for the benefit of present and future generations of humankind, on the basis of equity and in accordance with their common but differentiated responsibilities and respective capabilities**. Accordingly, the developed country Parties should take the lead in combating climate change and the adverse effects thereof.

Article 4 – Commitments.

(...) 5. The developed country Parties and other developed Parties included in Annex II **shall take all practicable steps to promote, facilitate and finance, as appropriate, the transfer of, or access to, environmentally sound technologies and knowhow to other Parties, particularly developing country Parties**, to enable them to implement the provisions of the Convention. In this process, the developed country Parties shall support the development and enhancement of endogenous capacities and technologies of developing country Parties. Other Parties and organizations in a position to do so may also assist in facilitating the transfer of such technologies.¹²³³ (*author’s emphasis*)

The same is observed in the Preamble of the Stockholm Convention on POPs, in its Paragraph 13, where the Parties to the Convention note

(...) **the respective capabilities of developed and developing countries, as well as the common but differentiated responsibilities of States** as set forth in Principle 7 of the Rio Declaration on Environment and Development, (...) ¹²³⁴. (*author’s emphasis*)

The principle assigns more responsibility to developed countries due to their historically greater environmental impact, driven by industrialisation, and their greater financial and technological capacities¹²³⁵.

It is important to consider how the common but differentiated responsibilities principle applies to (marine) plastic pollution, as both developed and developing countries contribute to MPP, but in different ways.

¹²³² Sands, P.; *et. al.* (2018). **Principles of International Environmental Law**. 4th ed., Cambridge: Cambridge University Press, p. 43. ISBN 978-1-108-42095-2.

¹²³³ UN (1992b). **United Nations Framework Convention on Climate Change**. Adopted in New York on 9 May 1992. Entry into force on 21 March 1994. Available at: https://unfccc.int/files/essential_background/background_publications_htmlpdf/application/pdf/conveng.pdf. Accessed on 11 June 2023.

¹²³⁴ UNEP (2011b). *Ob. cit.*, p. 7.

¹²³⁵ Sands, P.; *et. al.* (2018). *Ob. cit.*, p. 226.

While developed countries have higher *per capita* production and consumption of plastics, the direct discharge of plastic waste is more significant in developing countries. Additionally, high-income nations have historically exported plastic waste to lower-income countries with inadequate waste management infrastructure, exacerbating the issue¹²³⁶ – as discussed in Chapter II, Section I, Subsection B “2.2.1.2” of this thesis. Therefore, the historical dimension of plastic pollution may be relevant in applying this principle.

This principle, however, is not solely concerned with the historical aspect of an issue; it also considers the current situation and states’ capabilities. This is exemplified in UNCLOS, which grants specific privileges to developing and fish-dependent nations based on geographical and economic differences, as provided in its Articles 61 and 70

(...) 3. Such measures shall also be designed to maintain or restore populations of harvested species at levels which can produce the maximum sustainable yield, **as qualified by relevant environmental and economic factors, including the economic needs of coastal fishing communities and the special requirements of developing States**, and taking into account fishing patterns, the interdependence of stocks and any generally recommended international minimum standards, whether subregional, regional or global.

(...) 4. When the harvesting capacity of a coastal State approaches a point which would enable it to harvest the entire allowable catch of the living resources in its exclusive economic zone, the coastal State and other States concerned **shall cooperate in the establishment of equitable arrangements on a bilateral, subregional or regional basis to allow for participation of developing geographically disadvantaged States** of the same subregion or region in the exploitation of the living resources of the exclusive economic zones of coastal States of the subregion or region, as may be appropriate in the circumstances and on terms satisfactory to all parties. In the implementation of this provision the factors mentioned in paragraph 3 shall also be taken into account.¹²³⁷ (*author’s emphasis*)

Resolution 5/14 references “*national circumstances and capabilities*”, which likely draws from the Paris Agreement’s adaptation of the principle, emphasising current situations rather than solely historical emissions¹²³⁸. This formulation highlights the need for a global approach to managing plastic pollution, considering the varying circumstances and capabilities of nations around the world.

The UNEA mandate further recognises the common but differentiated responsibilities principle by recognising that “*the effective implementation of some legal*

¹²³⁶ Clift, R.; *et. al.* (2019). *Ob. cit.*, p. 103.

¹²³⁷ UN (1982a). *Ob. cit.*, p. 45-51.

¹²³⁸ Voigt, C.; Ferreira, F. (2016). Differentiation in the Paris Agreement. *Climate Law*, vol. 6, n. 1-2, p. 66. DOI: <http://dx.doi.org/10.2139/ssrn.2827633>. Available at: <https://ssrn.com/abstract=2827633>. Accessed on 12 March 2023.

*obligations under the instrument will depend on the availability of capacity-building and adequate financial and technical assistance (...)*¹²³⁹.

Nevertheless, making developing countries' obligations contingent on financial aid from developed nations could hinder progress and undermine the principle of "common" responsibility. This is especially pertinent as the distinction between "developed" and "developing" countries is increasingly contested, with many nations previously considered developing having seen significant economic growth in recent decades¹²⁴⁰.

Although the mandate does not explicitly refer to "developed" and "developing" countries, it acknowledges this dichotomy in Paragraph 2, by acknowledging

(...) that some legal obligations arising out of a new international legally binding instrument **will require capacity-building and technical and financial assistance** in order to be effectively implemented **by developing countries and countries with economies in transition**; (...) ¹²⁴¹. (*author's emphasis*)

While this division remains challenging, the focus should be on shared responsibility for tackling plastic pollution. Linking some countries' legal obligations to the willingness of others to provide assistance may hinder the treaty's effectiveness¹²⁴².

Financial assistance and technology transfer are important aspects of implementation but should not be the sole basis for compliance¹²⁴³. If such dependence is included, the obligations of developed countries to provide assistance should be clearly outlined to avoid stalling treaty implementation¹²⁴⁴.

¹²³⁹ UNEA (2022a). *Ob. cit.*, p. 3.

¹²⁴⁰ The classification of a developing country is a highly politicised matter. The geopolitical rise of emerging economies has sparked ongoing debates and re-negotiations regarding the definition of developing country status. In: Weinhardt, C.; Petry, J. (2024). Contesting China's Developing Country Status: Geoeconomics and the Public-Private Divide in Global Economic Governance. **The Chinese Journal of International Politics**, vol. 17, n. 1., p. 71. DOI: <https://doi.org/10.1093/cjip/poae004>. Available at: <https://academic.oup.com/cjip/article/17/1/48/7623843>. Accessed on 13 May 2024.

¹²⁴¹ UNEA (2022a). *Ob. cit.*, p. 2.

¹²⁴² Punka, A.K. (2023). *Ob. cit.*, p. 80.

¹²⁴³ In this sense, multilateral non-compliance procedures are incorporated into most MEAs to "identify Parties' compliance challenges and facilitate improved compliance in a non-confrontational way". As a result, most agreements include provisions to help countries meet their treaty obligations, often through dedicated implementation funding and capacity-building efforts. Numerous treaties also feature specific provisions that aid Parties in compliance processes. Generally, the compliance mechanisms in these treaties focus on offering solutions, guidance, and support to encourage compliance, while also allowing the governing body to develop alternative approaches for addressing persistent or intentional non-compliance. In: Center for International Environmental Law (2023). Implementation, Compliance, and Reporting: Key Elements to Consider in the Context of a Treaty to End Plastic Pollution. Available at: https://www.ciel.org/reports/preparatory-materials-for-the-plastics-treaty-inc-3-august-2023/implementation-compliance-and-reporting-key-elements-to-consider-in-the-context-of-a-treaty-to-end-plastic-pollution_final/. Accessed on 11 January 2024.

¹²⁴⁴ Punka, A.K. (2023). *Ob. cit.*, p. 80.

Differentiation could also take other forms, depending on the treaty's mechanisms. For instance, the Montreal Protocol allowed developing countries more time to phase out chlorofluorocarbons (CFCs)¹²⁴⁵, and a similar grace period could be granted for prohibiting certain additives or polymers in plastic products under the plastics treaty. Additionally, the 1990 Montreal Protocol Amendment established a Multilateral Fund for its implementation, an option that could be considered for the plastics treaty as well¹²⁴⁶.

Similarly, the recent BBNJ treaty has established a hybrid financing system, in addition to the general obligation on all State Parties to

provide, within its capabilities, resources in respect of those activities that are intended to achieve the objectives of this Agreement, taking into account its national policies, priorities, plans and programmes.¹²⁴⁷ (*author's emphasis*)

The BBNJ treaty explicitly designates State Parties capable of providing funding as the primary sources of financial support for all BBNJ-related activities. Article 52 creates the financing mechanism to assist in the treaty's implementation, with a particular focus on helping developing State Parties through measures like capacity building and technology transfer¹²⁴⁸.

In view of this, it is vital that the plastics treaty uses the principle of common but differentiated responsibilities and “*national circumstances and capabilities*” in a manner that emphasises cooperation, shared responsibility, and solutions tailored to the diverse

¹²⁴⁵ Under this treaty, all parties are assigned specific responsibilities concerning the phase-out of various groups of ozone depleting substances, the regulation of ozone depleting substances trade, annual data reporting, the establishment of national licensing systems to control ozone depleting substances imports and exports, and other related matters. Both developing and developed countries share equal yet differentiated responsibilities. Most importantly, both groups are bound by commitments that are time-bound, measurable, and enforceable. In: UNEP (2018f). About Montreal Protocol. Available at: <https://www.unep.org/ozonaction/who-we-are/about-montreal-protocol>. Accessed on 09 June 2023.

¹²⁴⁶ The Multilateral Fund for the Implementation of the Montreal Protocol was established in 1991 under Article 10 of the treaty. Its purpose is to offer financial and technical support to developing country parties to the Montreal Protocol, whose annual per capita consumption and production of ozone depleting substances is below 0.3 kg, to help them meet the Protocol's control measures. The activities of the Multilateral Fund are carried out by four international agencies: the UNEP, the UNDP, the UN Industrial Development Organization (UNIDO), and the World Bank, along with bilateral agencies from non-Article 5 countries. In: *Ibidem*.

¹²⁴⁷ BBNJ Agreement, Article 52 “Funding”, Paragraph 1. It is important to note that the Agreement is open for signature by all States and regional economic integration organisations from 20 September 2023 to 20 September 2025 and will enter into force 120 days after the date of deposit of the sixtieth instrument of ratification, approval, acceptance or accession. In: UN (2023a). *Ob. cit.*, p. 47.

¹²⁴⁸ IUCN (2024). Legal aspects of Financing Mechanism Options Summary under the Compilation Document (Expert Group 1). INC - Plastic Pollution Treaty Intersessional Work. Available at: <https://iucn.org/sites/default/files/2024-08/iucn-wcel-legal-brief-inc-intersessional-eg-1-financing-aug-2024-final-en.pdf>. Accessed on 20 August 2024.

challenges faced by countries¹²⁴⁹. Focusing solely on the actions of other states and making compliance contingent upon their behaviour could undermine the goal of a successful treaty¹²⁵⁰.

Further, Principle 8 of the Rio Declaration is also to be enshrined in the future LBI, considering that its main goal is to “decouple” economic growth from environmental degradation by enhancing the efficiency of resource use throughout the production, distribution, and consumption of goods. This approach aims to ensure that the energy, material, and pollution intensity of production and consumption remain within the natural ecosystems’ carrying capacities¹²⁵¹.

This principle establishes relationships, for example, with the 2030 Agenda, particularly with SDG 12 “*ensure sustainable consumption and production patterns*” and its target 12.5 “*by 2030, substantially reduce waste generation through prevention, reduction, recycling and reuse*”¹²⁵².

In this sense, the Osaka Blue Ocean Vision – which is mentioned in the Resolution 5/14¹²⁵³ –, in its “G20 Report on Actions against Marine Plastic Litter”, provides an analysis of the domestic legislation of countries, and mentions that the “*common use of plastic must move away from ‘take-make-waste’ towards a sustainable circular economy built on the 4R principles: reduce, reuse, recycle and renew*”. Some countries are going further on that approach – as it is a trend observed in the national legislation of nations like Finland and the Netherlands – and adding “refuse” to these “Rs”, making it “refuse, reduce, reuse, recycle and renew”¹²⁵⁴.

¹²⁴⁹ Cowan, E. (2025). **Orchestrating a Global Plastics Agreement**: Understanding the Actors in the Negotiating Arena with an Arctic Case Study on the Road to End Plastic Pollution. Norwegian University of Science and Technology, thesis for the Degree of Doctor Philosophiae Faculty of Social and Educational Sciences. Doctoral theses at NTNU, 2025:40, p. 44. ISSN 2703-8084. Available at: <https://ntnuopen.ntnu.no/ntnu-xmlui/handle/11250/3177832?show=full>. Accessed on 20 February 2025.

¹²⁵⁰ Punka, A.K. (2023). *Ob. cit.*, p. 81.

¹²⁵¹ Voigt, C. (2015). Principle 8: Sustainable Patterns of Production and Consumption and Demographic Policies. In: **The Rio Declaration on Environment and Development: A Commentary**. Oxford Commentaries on International Law, Viñuales, J.E. (ed.). Oxford, United Kingdom: Oxford University Press, p. 414. ISBN 9780199686773.

¹²⁵² UN (2015d). Goal 12 – Ensure sustainable consumption and production patterns. Available at: https://sdgs.un.org/goals/goal12#targets_and_indicators. Accessed on 09 May 2023.

¹²⁵³ “Welcoming efforts made by Governments and international organizations, in particular through national, regional and international action plans, initiatives and instruments, including relevant multilateral agreements such as the initiatives of the Group of 7 and the Group of 20, including the action plans of 2015 and 2017 addressing marine litter; the Group of 20 Implementation Framework for Actions on Marine Litter; Osaka Blue Ocean Vision; (...)”. In: UNEA (2022a). *Ob. cit.*, p. 2.

¹²⁵⁴ MoEFCC (2023). **G20 Report on Actions Against Marine Plastic Litter**. Fifth Information Sharing Based on the G20 Implementation Framework. Ministry of Environment, Forest and Climate Change, New Delhi, India. 1st Edition. 575 pp. Available at: https://g20mpl.org/wp-content/uploads/2023/07/MPL-report-_2023.pdf. Accessed on 02 March 2023.

In the case of (marine) plastic pollution, it is essential to ban the circulation and deposit of plastics in the environment, following the principle of the 5Rs, which calls for an increase in the ratio of recyclable materials, increased reuse of raw materials and manufacturing waste, and an overall reduction in resources and energy use, but above all to refuse the use of plastics that are not absolutely necessary and to extend the life of sustainable products¹²⁵⁵. This principle is similarly stated as “recover, recycle, reclamation, reuse” in the 2019 Minamata Convention on Mercury as well¹²⁵⁶.

This principle is being ventilated – in another of its many variants – in the context of the negotiation sessions as, actually, a possible core obligation “*encouraging reduce, reuse and repair of plastic products and packaging*”¹²⁵⁷.

Moreover, Principles 15 and 16 of the Rio Declaration are other essential elements for the future LBI, as Principle 15 supports the “precautionary approach”, while Principle 16 implicitly acknowledges the polluter pays principle¹²⁵⁸.

Where there is a risk of serious or irreversible harm from plastics, lack of scientific certainty must not delay the adoption of effective measures to address it, in application of the precautionary principle or approach, as appropriate¹²⁵⁹.

This principle is present in many instruments – several of which have been previously analysed in this thesis – such as the 1989 Basel Convention, the 1992 CBD, the 1997 MARPOL Convention, the 2001 Stockholm Convention on POPs and the 2023 BBNJ Treaty, as it is possible to read from their provisions

- Basel Convention, Article 4 – General Obligations.
 (...) 2. Each Party shall take the appropriate measures to:
 (...) (c) Ensure that persons involved in the management of hazardous wastes or other wastes within it **take such steps as are necessary to prevent pollution due to hazardous wastes and other wastes arising from such management and, if such pollution occurs, to minimize the consequences thereof for human health and the environment;**
 (d) Ensure that the transboundary movement of hazardous wastes and other wastes is reduced to the minimum consistent with the environmentally sound and efficient management of such wastes, and **is conducted in a manner which will protect human health and the environment against the adverse effects which may result from such movement;** (...)

¹²⁵⁵ Centre International de Droit Comparé de l’Environnement (2023). *Ob. cit.*, p. 10.

¹²⁵⁶ Article 3: “(...) recovery, recycling, reclamation, direct re-use or alternative uses”. In: UNEP (2024d). *Ob. cit.*, p. 10.

¹²⁵⁷ In this sense, according to the working document for INC-2, the “reduction, reuse and repair of products and packaging can be facilitated through the product design stage. Reuse schemes can contribute to resource efficiency. They have the potential to decrease life cycle greenhouse gas emissions by 60 to 80 per cent compared to emissions of single-use plastic products. It is also estimated that new reuse schemes and delivery models could create 1.4 million jobs globally by 2040.” In: UNEP (2023b). *Ob. cit.*, p. 9.

¹²⁵⁸ Sands, P.; *et. al.* (2018). *Ob. cit.*, p. 43.

¹²⁵⁹ Centre International de Droit Comparé de l’Environnement (2023). *Ob. cit.*, p. 9.

(g) **Prevent the import of hazardous wastes** and other wastes if it has **reason to believe that the wastes in question will not be managed in an environmentally sound manner**; (...) ¹²⁶⁰ (*author's emphasis*)

- CBD, Preamble, Paragraph 9.

Noting also that where there is a threat of significant reduction or loss of biological diversity, **lack of full scientific certainty should not be used as a reason for postponing measures to avoid or minimize such a threat**, (...) ¹²⁶¹ (*author's emphasis*)

- MARPOL 1997 (Protocol - Annex VI).

RECALLING **Principle 15 of the Rio Declaration** on Environment and Development which calls for the **application of a precautionary approach**, (...)

(...) Regulation 3 MARPOL Annex VI shall not apply to: (...) Any emissions resulting from damage to a ship or its equipment:

Provided that **all reasonable precautions have been taken after the occurrence of the damage or discovery of the emission for the purpose of preventing or minimizing the emission**; (...) ¹²⁶² (*author's emphasis*)

- Stockholm Convention on POPs.

Article 1 – Objective.

Mindful of the precautionary approach as set forth in **Principle 15 of the Rio Declaration on Environment and Development**, the objective of this Convention is to protect human health and the environment from persistent organic pollutants. ¹²⁶³ (*author's emphasis*)

- BBNJ Treaty

Article 7 – General principles and approaches.

In order to achieve the objectives of this Agreement, Parties shall be guided by the following principles and approaches: (...)

(e) The **precautionary principle or precautionary approach**, as appropriate; (...) ¹²⁶⁴ (*author's emphasis*)

In the context of plastic pollution, in order to take into account the uncertainty linked to the life cycle of plastics (temporality and impacts of all forms of degradation on health and the environment), the precautionary principle applies to all stages of decision-making.

¹²⁶⁰ SBC (2023). *Ob. cit.*, p. 14-16.

¹²⁶¹ UNEP (2011a). *Ob. cit.*, p. 2.

¹²⁶² IMO (2005). Resolution MEPC.132(53). Amendments to the Annex of the Protocol of 1997 to amend the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 Relating Thereto (adopted on 22 July 2005). Available at: <https://www.transport.govt.nz/assets/Uploads/Policy/OC05343-MARPOL-Annex-VI-treaty-text.pdf>. accessed on 02 June 2022.

¹²⁶³ UNEP (2011b). *Ob. cit.*, p. 2.

¹²⁶⁴ UN (2023a). *Ob. cit.*, p. 5.

It is also worth stating that all principles of environmental law are interdependent and inseparable, as are all human rights. In this regard, the precautionary principle and the principle of non-regression go hand in hand and must complement each other¹²⁶⁵.

The principle of non-regression, which seeks to prevent setbacks in environmental protection, is recognised in various legal frameworks (explicit or implicit) and could apply to the fight against plastic pollution¹²⁶⁶.

It is important to note that the adoption of such a principle does not prevent the repeal or amendment of existing laws. It is not about “freezing” environmental law. On the contrary, as scientific progress occurs through the application of the precautionary principle, laws may either be strengthened to address emerging threats to health and nature, or relaxed if evidence shows that a previously harmful source of pollution is no longer a concern. The key is that any new rule must continue to support environmental and health protection, without exacerbating pollution or biodiversity loss¹²⁶⁷.

In the case of plastic pollution, the “polluter pays” principle should apply within the framework of international cooperation¹²⁶⁸, whereby the costs of measures to prevent, combat and reduce plastic pollution shall be borne by the polluter, as reflected in the Stockholm Convention

Reaffirming Principle 16 of the Rio Declaration on Environment and Development which states that national authorities should endeavour to promote the **internalization of environmental costs** and the use of economic instruments, taking into account the **approach that the polluter should, in principle, bear the cost of pollution**, with due regard to the public interest and without distorting international trade and investment, (...).¹²⁶⁹ (*author's emphasis*)

Most of these analysed principles were consistently reinforced during the negotiation sessions – with many being explicitly advocated by Member States¹²⁷⁰ and mentioned in official documents, as it is seen in the Report of the INC-1

¹²⁶⁵ Prieur, M. (2021). *L'émergence du principe de non régression ou l'illustration du rôle de la doctrine dans la création du droit de l'environnement*. *Rivista Quadrimestrale Di Diritto Dell'ambiente*, n. 2, p. 27. ISSN 2239-964X. Available at: https://www.rqda.eu/?dl_id=269. Accessed on 19 May 2022.

¹²⁶⁶ Centre International de Droit Comparé de l'Environnement (2023). *Ob. cit.*, p. 9.

¹²⁶⁷ Prieur, M. (2012). Non-regression in environmental law. *S.A.P.I.E.N.S.*, vol. 5, n. 2, p. 55. Available at: <http://journals.openedition.org/sapiens/1405>. Accessed on 11 March 2022.

¹²⁶⁸ Centre International de Droit Comparé de l'Environnement (2023). *Ob. cit.*, p. 10.

¹²⁶⁹ UNEP (2011b). *Ob. cit.*, p. 5.

¹²⁷⁰ In fact “(...) Many supported implementing the polluter-pays principle, including through EPR schemes, and many supported the principle of common but differentiated responsibilities (CBDR). A number of Members supported the establishment of a contact group on means of implementation.” In: UNEP (2022m). Report of the intergovernmental negotiating committee to develop an international legally binding instrument on plastic pollution, including in the marine environment, on the work of its first session. Punta del Este, Uruguay, 28 November–2 December 2022 (UNEP/PP/INC.1/14). Available at:

(...) to specific principles of international environmental law (e.g., **common but differentiated responsibilities and respective capabilities, equity, precautionary principle, polluter pays principle**); to establishing **extended producer responsibility (EPR)** schemes and addressing hazardous plastics; to the importance of ambitious means of implementation, including the establishment of a dedicated multilateral fund; (...) ¹²⁷¹. (*author's emphasis*)

Beyond the Principles of the Rio Declaration, as stated by the INC-1 Report, it is expected that Extended Producer Responsibility (EPR) schemes are established, as these align with the ambition of the future convention. The EPR is a model founded on the polluter-pays principle – which seeks to involve producers of material goods in waste management and treatment, while ensuring that raw materials and products remain within the economic cycle ¹²⁷².

Although not expressly mentioned in the Resolution 5/14, EPR is a crucial environmental policy tool for addressing (marine) plastic pollution, where a producer's responsibility for a product extends beyond its creation – which is very significant when it comes to land-based MPP as well ¹²⁷³.

EPR shall be applied to reinforce the responsibilities of the manufacturer of plastic products at the various stages of the lifecycle of plastics, including take-back, recycling and disposal – so the costs of the negative environmental externalities of the products shall be transferred to the producers ¹²⁷⁴. In this sense, see Figure 37:

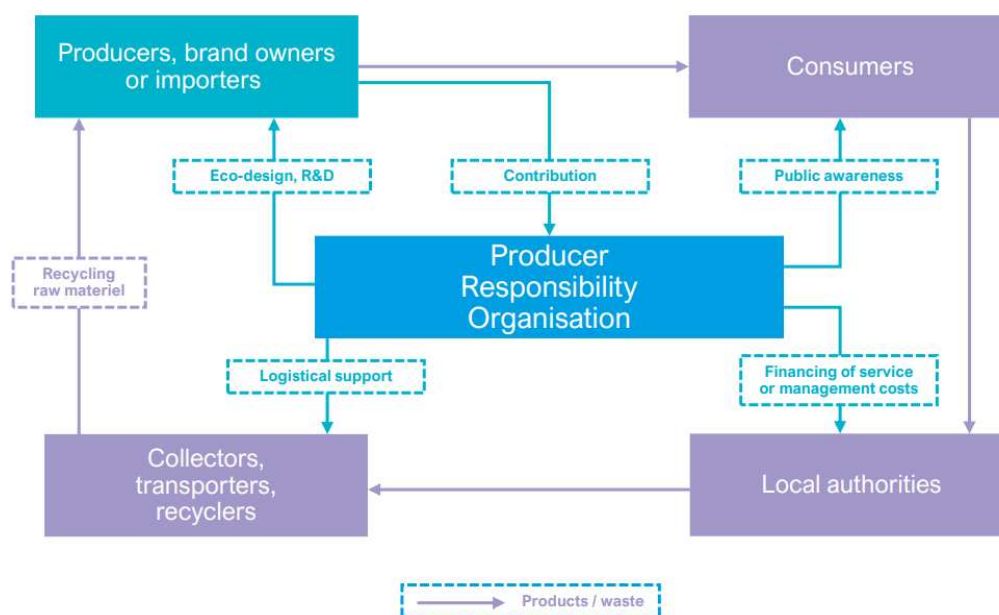
<https://wedocs.unep.org/bitstream/handle/20.500.11822/42282/INC1reportReissuedAdvance.pdf>. Accessed on 21 January 2023.

¹²⁷¹ *Ibidem*.

¹²⁷² UNEP (2022n). Integrate Extended Producer Responsibility within the International plastics Treaty. Common position Paper. Available at: https://apps1.unep.org/resolutions/uploads/integrate_epr_within_the_international_treaty_on_plastics_pollution_1.pdf. Accessed on 21 January 2023.

¹²⁷³ UNEP (2022e). *Ob. cit.*, p. 3.

¹²⁷⁴ OECD (2022b). **Deposit-refund systems and the interplay with additional mandatory extended producer responsibility policies**. OECD Environment Working Papers No. 208. DOI: <https://dx.doi.org/10.1787/a80f4b26-en>. Available at: https://www.oecd.org/content/dam/oecd/en/publications/reports/2022/12/deposit-refund-systems-and-the-interplay-with-additional-mandatory-extended-producer-responsibility-policies_c92a063b/a80f4b26-en.pdf. Accessed on 13 January 2023.

Figure 37 – Simplified operation of an Extended Producers Responsibility¹²⁷⁵

Source: UNEP (2022n). Integrate Extended Producer Responsibility within the International plastics Treaty. Common position Paper.

In practice, EPR requires producers to manage their products after they become waste, which includes tasks such as collection, pre-treatment (*e.g.*, sorting, dismantling, or depollution), preparation for reuse, recovery (including recycling and energy recovery), or final disposal. EPR systems enable producers to fulfil this responsibility by providing financial support or taking on the operational responsibilities previously handled by municipalities¹²⁷⁶.

- *Full Life-cycle Approach*

The Resolution 5/14 emphasises the need for the instrument to adopt a “comprehensive approach that addresses the full life cycle of plastic”¹²⁷⁷. This aligns with a recent shift in perspective regarding plastic waste, moving from a traditional “take-

¹²⁷⁵ UNEP (2022n). *Ob. cit.*, p. 4.

¹²⁷⁶ UNEP (2022e). *Ob. cit.*, p. 3.

¹²⁷⁷ UNEA (2022a). *Ob. cit.*, p. 2.

make-waste” model to a circular or life-cycle approach¹²⁷⁸ - as well as it stresses the connections between EPR and the full life cycle approach¹²⁷⁹.

Since the mass production of plastics began in the late 1950s, the approach has been predominantly linear¹²⁸⁰ and, to create a CE for plastics, a complete shift in how this versatile material is perceived and handled is fundamental¹²⁸¹.

In this regard, a working definition of “*full life cycle approach*” has been developed as a key term in the document “Plastics science”, which highlights that scientific evidence underscores the necessity for a comprehensive and integrated approach to addressing solutions throughout the entire plastics life cycle. These solutions could involve a mix of regulatory, economic, technological, and behavioural measures, alongside the use of trade policies¹²⁸².

In addition, the document also recognises that

Throughout its life cycle, **plastic also contributes to climate change**. In 2019, plastics generated 1.8 billion metric tons of **greenhouse gas emissions** – 3.4 per cent of global emissions – with 90 per cent of those emissions coming from plastics production and conversion from fossil fuels.¹²⁸³ (*author’s emphasis*)

The “Plastics science” document further emphasises that

Following a life-cycle approach is critical. (...) the best combination of policies across the life cycle will differ based on each Member State’s needs. But **following a life-cycle approach and applying policies in an integrated way can set the world on the path to a circular plastics economy.**¹²⁸⁴ (*author’s emphasis*)

Although the Resolution 5/14 calls for the instrument to “*promote sustainable production and consumption of plastics through (...) product design and environmentally sound waste management, including through (...) circular economy approaches*”¹²⁸⁵, the

¹²⁷⁸ A more detailed analysis on circular economy is provided in Part I, Chapter II, Section I “A” of this thesis.

¹²⁷⁹ EPR is closely linked to the full life-cycle approach, as it extends a producer’s responsibility beyond the point of sale, incorporating the entire life cycle of a product. This includes the upstream stages such as raw material extraction and product design, as well as the downstream stages like collection, recycling, and disposal, aiming for a comprehensive management of plastic waste from production to final disposal. By embracing the full life-cycle perspective, EPR helps address plastic pollution at every stage of a product’s existence, encouraging a more sustainable and circular approach. In: Kar, J.,; *et. al.* (2024). Extended producer responsibility and a global plastics treaty – what do the experts say? World Economic Forum – Circular Economy (Centre for Nature and Climate). Available at: <https://www.weforum.org/stories/2024/11/extended-producer-responsibility-global-plastics-treaty-experts/>. Accessed on 20 February 2025.

¹²⁸⁰ Villarrubia-Gómez, P.; *et. al.* (2018). *Ob. cit.*, p. 2015.

¹²⁸¹ Punka, A.K. (2023). *Ob. cit.*, p. 81.

¹²⁸² UNEP (2022b). *Ob. cit.*, p. 3.

¹²⁸³ For more about the “plastic-climate nexus”, see Part II, Chapter II of this thesis.

¹²⁸⁴ UNEP (2022b). *Ob. cit.*, p. 3.

¹²⁸⁵ UNEA (2022a). *Ob. cit.*, p. 3.

use of the verb “to promote” does not imply mandatory obligations or enforcement, allowing for flexibility in implementation¹²⁸⁶.

Promotion could involve provisions with weaker legal status, such as “welcoming” states to adopt sustainable practices, or rather, stronger provisions that imply binding obligations, such as requiring states to “take immediate action” to develop these approaches¹²⁸⁷. Additionally, promotion could include mechanisms that support the transition to sustainable production and consumption¹²⁸⁸, such as technology transfers, financial assistance, and research and development for best practices¹²⁸⁹.

While the Resolution 5/14 highlights the need to address the entire life cycle of plastics, no unified definition has been reached so far¹²⁹⁰. This became evident during INC-3, when some more progressive states argued that the full life cycle should encompass the upstream production of raw plastic materials and products and therefore should be included in the treaty’s provisions¹²⁹¹.

In contrast, other states contended that the treaty’s scope should be confined to enhancing plastic pollution management, as pollution is primarily caused by mismanagement of the material¹²⁹². These states maintained that a treaty covering the full life cycle of plastics would start at the midstream, focusing on product design¹²⁹³.

For instance, in a China’s text proposal on Primary Plastic Production, the country stated that “*turning off the tap should not be turning off the production. It should be turning off the plastics flowing to the environment*”¹²⁹⁴ – this is, however, misleading, as the real priority should be dedicated to preventing waste by tackling the root causes – production processes and (over-) consumption¹²⁹⁵.

¹²⁸⁶ Punka, A.K. (2023). *Ob. cit.*, p. 81.

¹²⁸⁷ UNEA (2022a). *Ob. cit.*, p. 1-4.

¹²⁸⁸ Recalling SDG 12, which is about promoting sustainable consumption and production patterns, as they are essential to preserving the livelihoods of both present and future generations.

¹²⁸⁹ Punka, A.K. (2023). *Ob. cit.*, p. 82.

¹²⁹⁰ There is no legally recognised definition of a full life-cycle approach for plastics. In: Center for International Environmental Law (2024b). Plastic Polymers under the Full Life Cycle Approach: Key Considerations on the Scope of the Future Plastics Treaty. Available at: <https://www.ciel.org/wp-content/uploads/2024/04/plastic-polymers-full-life-cycle-of-plastics-brief.pdf>. Accessed on 18 May 2024.

¹²⁹¹ Dreyer, E.; *et al.* (2024). *Ob. cit.*, p. 25.

¹²⁹² As extensively discussed in Part I, Chapter II, Section I “A”, strategies that target only one element of the economy (in this case, the “management”, but it could also be “recycling”) fail to address the problem in its complexity – as there is a need for systemic change. In: UNEP (2023e). *Ob. cit.*, p. 58.

¹²⁹³ Dreyer, E.; *et al.* (2024). *Ob. cit.*, p. 25.

¹²⁹⁴ UNEP (2023j). China’s text proposal in CG1 on B1 Primary Plastic Production. Third Session (INC-3): In-session documents. Available at: https://resolutions.unep.org/resolutions/uploads/china_primaryplasticproduction.pdf. Accessed on 11 January 2024.

¹²⁹⁵ For more, see Part I, Chapter II, Section I “A”. In: Lesniewska, L.; Steenmans, K. (2023). *Ob. cit.*, p. 75-76.

In conclusion, the mandate's reference to a “*comprehensive approach*” may suggest that at least part – if not the entirety – of the CE framework will be integrated into the treaty¹²⁹⁶.

¹²⁹⁶ Punka, A.K. (2023). *Ob. cit.*, p. 83.

3.1.2 Shaping a Global Plastics Treaty: Analysing the Negotiation Process and Key Outcomes

Plastic pollution is rapidly outpacing current efforts to stop it. Without additional action, the volume of plastic on the market will double, the annual volume of plastic entering the ocean will triple, and ocean plastic stocks will quadruple in the next 20 years. The costs of inaction are mounting year by year, and it is truly welcome that work is underway to finally find a global solution as a matter of urgency.

The negotiation process for a global legally binding instrument to combat (marine) plastic pollution has been a complex journey, marked by significant discussions and disagreements over the past few years.

From the early sessions of the Intergovernmental Negotiating Committee to the most recent rounds, delegates have worked to establish a comprehensive framework that can effectively address the growing plastic pollution crisis. As these negotiations have unfolded, the challenges of balancing diverse national interests, economic concerns, and environmental priorities have been at the forefront of the discussions.

The INC-4 and INC-5 sessions, in particular, revealed deep divisions over critical issues such as plastic production limits, waste management strategies, and financing mechanisms, all of which have complicated efforts to reach a consensus.

Despite these challenges, progress has been made in clarifying areas of common ground and differences in perspective. The draft texts have evolved over time, with increasing focus on refining core obligations and institutional arrangements, though many contentious points remain unresolved.

The treaty's potential to address the full lifecycle of plastics, from production to disposal, is central to its effectiveness in tackling plastic pollution. As the process moves toward its final stages, the future of the treaty hinges on navigating these remaining disagreements while ensuring the treaty is both ambitious and inclusive.

One critical aspect that has emerged is the need for a just and inclusive transition, which takes into account the impacts on vulnerable communities, particularly those in the informal sector, who may be affected by policy changes.

Looking ahead, the outcome of the final treaty remains uncertain, with three main scenarios possible: a highly ambitious treaty with comprehensive global rules, a medium-ambition treaty focused on key aspects such as plastic production and waste management, or a low-ambition approach that allows for regional or national solutions to address plastic pollution. The future of the treaty will depend on the ability of negotiators to bridge the

divides between countries, secure financial mechanisms, and ensure that the treaty's measures align with global sustainability goals.

The final version of the treaty will need to provide clear, binding commitments that can drive systemic change in the global plastics economy, while also protecting human health and the environment.

As the negotiations continue, the hope is that the treaty will not only address the urgent issue of (marine) plastic pollution but also pave the way for a fair, just, and inclusive transition to a more sustainable circular economy.

With (*at least*) another round of negotiations yet to be held, the INC process will need to deliver a treaty that is both globally binding and flexible enough to accommodate national and regional differences. Ultimately, the success of the treaty will be measured by its ability to foster international cooperation and deliver tangible outcomes in the fight against plastic pollution, ensuring a cleaner and healthier planet for future generations.

In view of this, this section is divided into two subsections.

Subsection A “3.1.2.1” provides a detailed overview of the negotiation process, highlighting key moments and challenges during the various sessions of the INC, examining the progress made, the areas of disagreement, and the evolving draft texts that have shaped the course of the treaty's development.

Subsection B “3.1.2.2”, on the other hand, looks ahead to the potential outcomes of the treaty, considering the various scenarios for its final form. It explores the ongoing challenges and the critical issue of ensuring a just and inclusive transition, particularly for vulnerable communities, while emphasising the need for the treaty to address the entire plastic lifecycle and balance global ambition with national and regional realities.

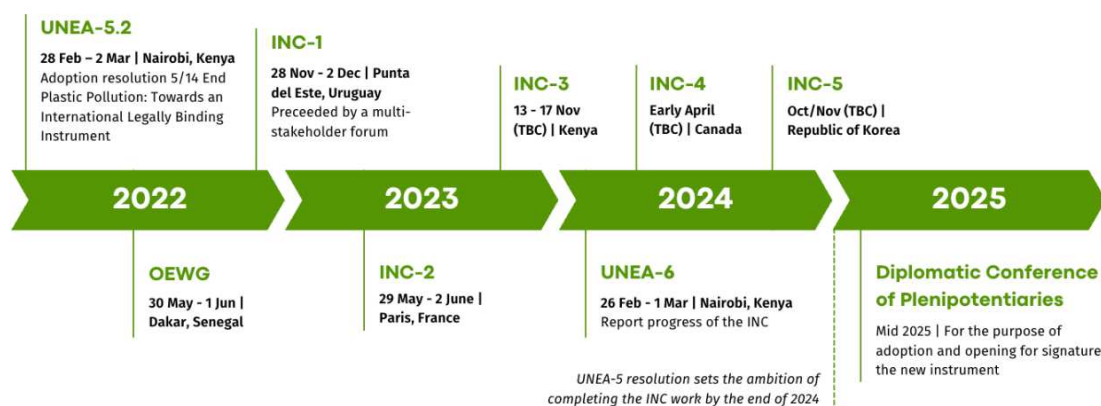
3.1.2.1 The INC Sessions: Uncovering Challenges and Diverging Perspectives

The path until the beginning of the negotiations for the future plastics LBI has been complex¹²⁹⁷, but it must be considered that the evolution of scientific knowledge is essential to support international legal measures and to provide sufficient communications to decision-makers, aimed specifically at fighting (marine) plastic pollution¹²⁹⁸.

Although the UNEA mandate had established a deadline for the end of negotiations, delegates acknowledged the need for additional time to address differing perspectives and refine the treaty's framework.

In this regard, Figure 38 represents the ambitious timeline set by Resolution 5/14:

Figure 38 – The INC Process¹²⁹⁹



Source: Geneva Environment Network (2022). Plastic Pollution INC-1. Update.

Figure 39, on the other hand, illustrates the current scenario, following the failures of INC 5.1 and INC 5.2 to finalise the agreement – due to the lack of consensus among the parties – which made it necessary to convene a third part of the fifth negotiating session:

¹²⁹⁷ This process can be described as complex for several reasons. First, it required sufficient scientific and technical knowledge about plastic pollution to convince the international community of the urgency of taking collective action. Second, although the mandate provided by UNEA through Resolution 5/14 was ambitious, aiming to finalise the agreement by the end of 2024, this timeline proved unattainable in practice.

¹²⁹⁸ It is worth recalling, in this sense, that besides its relevance, ocean research remains poorly funded: it receives only a tiny part – less than 2% on average – of national research budgets. In: IOC-UNESCO (2021). *Ob. cit.*, p. 10.

¹²⁹⁹ Geneva Environment Network (2022). Plastic Pollution INC-1. Update. Available at: <https://www.genevaenvironmentnetwork.org/resources/updates/towards-plastic-pollution-inc-1/>. Accessed on 17 December 2024.

Figure 39 – The updated INC Process¹³⁰⁰

Source: Adapted from Geneva Environment Network (2025). International Cooperation on Plastic Pollution | Plastics and the Environment Series. Update.

The negotiations so far have highlighted substantial disagreements among countries on crucial issues, including the treaty's scope, limitations on plastic production, regulations regarding harmful chemical additives in plastics, and funding for implementation in the most impacted regions. These unresolved conflicts are hindering progress toward a treaty that could protect both human and environmental health across the entire plastic lifecycle, from production and design to disposal.

To better understand the development and progression of this process, the INC sessions are analysed below.

- *First Round: INC-1 Meeting*

More than 160 countries were represented, with more than 2.300 registered delegates, during the INC-1. The President of Uruguay, the host country, stressed the importance of knowledge, individual, corporate, and state responsibility, and optimism on the path to a treaty¹³⁰¹.

During the meetings, general options for the structure of the international LBI on plastic pollution were discussed¹³⁰², as well as its potential elements, including key

¹³⁰⁰ Geneva Environment Network (2025). International Cooperation on Plastic Pollution | Plastics and the Environment Series. Update. Available at: <https://www.genevaenvironmentnetwork.org/resources/updates/international-cooperation-on-plastic-pollution/>. Accessed on 17 August 2025.

¹³⁰¹ Earth Negotiations Bulletin (2022). Summary of the First Meeting of the Intergovernmental Negotiating Committee to Develop an International Legally Binding Instrument on Plastic Pollution: 28 November – 2 December 2022, p. 2. Available at: <https://enb.iisd.org/sites/default/files/2022-12/enb3607e.pdf>. Accessed on 31 May 2023.

¹³⁰² UNEP (2022i). *Ob. cit.*, n.p.

concepts, procedures and mechanisms of legally binding multilateral agreements that can be relevant to foster the implementation of and compliance with the new LBI¹³⁰³.

The INC-1 organised its work through an agenda, which determined, after the adoption of the rules of procedure, to move forwards with the proper discussions about the treaty. In the topic 4 of the agenda adopted for the session¹³⁰⁴, then, Delegates were allowed to give their statements – opportunity where many members emphasised the direct and disproportionate impact of plastic pollution on their futures, ecosystems, environments, national identities and culture, and livelihoods. Others also stressed the links between plastic pollution and climate change¹³⁰⁵.

Concerning the LBI's structure, several States manifested that the future treaty should approach the Paris Agreement as far as it should take the form of a framework convention with NAPs, *i.e.*, a bottom-up approach. There were many other interventions highlighting other MEAs, including the need to promote synergies among important mechanisms¹³⁰⁶.

The focus of deliberations during the working week was not only on the substantive issues of the agreement, such as the objectives, scope and structure of the treaty, but also on procedural and organisational issues, such as the determination of the deliberation protocol to be adopted, the methods of implementation and monitoring of the effectiveness of the instrument and the form of participation of other interested parties in the construction of the agreement¹³⁰⁷.

During most of the week, discussions on substantive issues occupied a large part of the work programme, but some time was also reserved for voting procedures and the election of the Committee's bureau. However, there was no consensus to approve candidates to form the bureau and the elections for INC-2 were postponed.

There was also no consensus regarding the voting procedure, especially after some countries questioned the voting rights of regional economic integration organisations, such as the EU. Without an agreement, INC-1 was unable to determine the procedure for approving substantive issues, and decision-making processes had to be adopted on the basis of consensus rather than voting, which left room for countries to delay or block the flow of activities¹³⁰⁸.

¹³⁰³ UNEP (2022l). *Ob. cit.*, n.p.

¹³⁰⁴ “4. Preparation of an international legally binding instrument on plastic pollution, including in the marine environment”. In: UNEP (2022m). *Ob. cit.*, p. 3.

¹³⁰⁵ *Ibid.*, p. 12.

¹³⁰⁶ *Ibid.*, p. 13.

¹³⁰⁷ UNEP (2022m). *Ob. cit.*, p. 14.

¹³⁰⁸ Earth Negotiations Bulletin (2022). *Ob. cit.*, p. 9.

Again, with regards to the deliberative procedures, there has been much debate on the level and form of stakeholder participation in the negotiation process of the new instrument.

While in the speech delegates repeatedly underlined that stakeholder participation is essential for the development of the treaty and its implementation, in practice virtually all delegations agreed that the involvement of relevant actors should be more limited – differentiated from the participation of interested Member States – and that their contributions should be submitted only in writing and during periods between meetings of the INC, so that Committee members have time to analyse them.

Although some delegations supported virtual and in-person participation of key actors, as they play an important role in the implementation of MEAs, the flexibility to include their participation was not achieved in this first meeting¹³⁰⁹.

Another point of strong divergence between the delegations present at INC-1 concerned the participation of sector stakeholders in the negotiation process.

Some delegates said that it was necessary to include them, as without them the treaty would be unbalanced and difficult to comply with, and that the procedure adopted by the UNFCCC, in which these actors are involved in the process, should be observed.

However, other delegates pointed out that the involvement of the petrochemical industry could corrupt the entire negotiation, due to the strength of its lobby. In this case it was suggested to follow the measures of the Framework Convention on Tobacco Control, which prohibited the involvement of the tobacco industry in its negotiation process. Again, there was no consensus on this agenda item during INC-1¹³¹⁰.

During discussions on financing mechanisms to assist in the implementation of the treaty, developing countries expressed support for the creation of a dedicated fund, among other forms of financial support.

Developed countries, especially the EU, have assumed that the best way to solve the problem would be to use the resources of existing innovative funds, which collect amounts from taxes and fines imposed on polluters, as well as private donations.

Nonetheless, the adoption of this type of funding raised concerns among some delegations, who stated that they feared that raising funds through this means would become an indirect incentive to pollute, like a “*permission to pollute*”, since many polluters have sufficient resources to indefinitely pay fines for failure to comply with

¹³⁰⁹ *Ibid.*, p. 4-5.

¹³¹⁰ Earth Negotiations Bulletin (2022). *Ob. cit.*, p. 4.

environmental protection standards or provide large amounts of donations in exchange for the benefit of relaxing standards¹³¹¹.

During the development of the work, some delegations expressed the importance of first addressing the subjective issues of the treaty, before determining the form of the instrument.

This is because, before we even know what form this agreement will take, it would be necessary to level out some basic concepts, such as the definition of the life cycle of plastic, so that all countries start from the same point.

There is no consensus on determining where the life cycle of this material begins and ends, whether it will begin in the early stages of production or only in the product design phase, for example.

Controversy has also been noted regarding the ability and safety of current methods used to recycle plastic, as most products contain highly toxic additives in their production, which is not desirable. Scientists say there is currently no safe way to recycle plastic that contains a high volume of these additives. The CE is based on the tripod of reduce, reuse and recycle. If safe recycling was still not a viable option, the entire model would have to be rethought¹³¹².

Regarding the objectives of this LBI, delegations supported the definition that the treaty must protect the environment and human health from plastic pollution and ultimately eliminate this type of pollution.

However, there is a divergence between the delegations that support a drastic reduction in plastic production and those that argue that it is only necessary to close the cycle of this material, that is, to reuse and recycle all the plastic produced, reinserting it into the production chain without the need to produce less product.

In turn, the need for objectives covering the environmentally sound management of plastic waste was reaffirmed, as well as the means of implementing the treaty, approaches to the CE, human and labour rights, intergenerational equity and a just transition¹³¹³.

Regarding the scope, most delegations expressed a preference for an approach that encompasses the entire life cycle of plastic, sources of plastic pollution, materials,

¹³¹¹ UNEP (2022m). *Ob. cit.*, p. 13.

¹³¹² *Ibid.*, p. 14.

¹³¹³ Earth Negotiations Bulletin (2022). *Ob. cit.*, p. 7.

products, substances, uses and processes in the polymerization phase, materials, alternative raw materials and the fight against plastic in the marine environment¹³¹⁴.

As regards the structure, a divergence of position was found between the States in favour of the adoption of a legally binding format, with rigid obligations and control measures (hard law), and those who considered it more interesting to invest in the construction of a Framework Convention, guided by national action plans, with recommendations and weaker control measures (soft law). There were also those who supported the creation of a hybrid treaty, including provisions of both a voluntary and binding nature¹³¹⁵.

Disagreement over the form of the treaty was one of the major obstacles to continuing the negotiation work¹³¹⁶. The scientific community is unanimous in stating that the best recommendation is that the tool developed is legally binding and includes global standards, bans and restrictions on the production of new plastic.

Nevertheless, for it to be successful, the treaty must be adopted by as many UN Member States as possible, which has proven to be a delicate mission, as some countries, including the USA¹³¹⁷, are trying to undermine the chances of consensus in the creation of a LBI, pushing for the creation of a system of voluntary commitments that deviate from the most restrictive measures, such as limiting or banning plastic production¹³¹⁸.

At this point, it is interesting to note how the concept of “reluctance” becomes relevant for this analysis. Reluctance is often linked to a mixed attitude, indecisiveness, and selective engagement. For instance, the USA initially championed the idea of an International Trade Organization after World War II but later withdrew its support. It signed numerous human rights conventions yet failed to ratify them during the Cold War. In the post-Cold War era, the USA has been described as a “reluctant sheriff”, grappling with the costs of maintaining global order and growing domestic indifference and division

¹³¹⁴ UNEP (2022m). *Ob. cit.*, p. 5-6.

¹³¹⁵ *Ibid.*, p. 13.

¹³¹⁶ Cowan, E. (2024). Event Ethnography to study the global negotiations on the treaty to end plastic pollution: dataset from the first session of negotiations (INC-1). **Journal of Environmental Studies and Sciences**, p. 5. DOI: <https://doi.org/10.1007/s13412-024-00914-4>. Available at: <https://link.springer.com/article/10.1007/s13412-024-00914-4>. Accessed on 20 April 2024.

¹³¹⁷ In September 2022, reports indicated that the USA was working to build a coalition of countries to lead negotiations on a global plastic pollution treaty. The USA aims to shape the treaty based on the approach of individual countries, such as the 2015 Paris Agreement, rather than establish new universal rules preferred by other UN Member States. In: Ammendolia, J.; Walker, T.R. (2022a). U.S. Seeks Weaker Global Plastics Treaty. SSRN, Abstract. Available at: <https://ssrn.com/abstract=4248247>. Accessed on 22 December 2022.

¹³¹⁸ Ammendolia, J.; Walker, T.R. (2022b). Global plastics treaty must be strict and binding. **Nature**, vol. 611, n. 236. DOI: [10.1038/d41586-022-03581-z](https://doi.org/10.1038/d41586-022-03581-z). Available at: <https://pubmed.ncbi.nlm.nih.gov/36347957/>. Accessed on 17 February 2023.

on foreign policy matters. This reluctance tends to result in ad hoc, short-term strategies and a lack of clear direction and purpose¹³¹⁹ – a reluctance that is being reflected also in the context of this negotiation.

At the end of INC-1, it was obvious that there were many disagreements regarding the delegations' vision for how the treaty should strongly reflect their level of economic development and their countries' association with plastic production or the generation of plastic waste¹³²⁰.

Developing countries advocate for a differentiation of responsibilities based on each country's capabilities and the degree of their contribution in causing and increasing the world's plastic pollution problem – pursuant to the principle of the common but differentiated responsibilities. Smaller countries with less capacity to impact the ecosystem would also participate in the implementation of the agreement, but in a manner that is proportional to the impact they cause, so as not to create a burden when they join the treaty.

In this way, the first meeting of the INC was the beginning of a seemingly complex and winding journey towards building the Global Treaty against Plastic Pollution. The countries represented were expected to differ on several points during the negotiations, but what was seen in reality was that there was: i) a large discrepancy in the way the delegations think of a final format for the text; and ii) there are many disagreements when it comes to the level of openness to making major concessions for the conclusion of the most relevant MEA negotiations in recent history¹³²¹.

Based on the first impressions generated, the difficulties highlighted and the possibilities identified in the first round of negotiations, INC-2 would need to foresee the proposed solutions to the bottlenecks observed in INC-1 and be able to better manage conflicts of interest of all the parties involved in this process, guiding the delegations towards a common middle ground, under penalty, once again, of closing the meetings without conclusive solutions to resolve the differences on the key points of the instrument.

At the end of INC-1, the Committee asked the Secretariat to prepare an “options document” ahead of INC-2, setting out the existing possibilities for the elements that will constitute the international LBI, based on addressing the whole life cycle of plastics, identifying possible objectives and substantive provisions such as core obligations,

¹³¹⁹ Destradi, S. (2023). **Reluctance in World Politics**: Why States fail to act decisively. Bristol: Bristol University Press, p. 15. ISBN 978-1-5292-3023-9.

¹³²⁰ Cowan, E. (2024). *Ob. cit.*, p. 5.

¹³²¹ UNEP (2022h). *Ob. cit.*, n.p.

control and implementation measures and means, and voluntary approaches, including binding and voluntary provisions¹³²².

The options document provides an overview of all possible solutions presented to overcome problem and was proposed to serve as a basis for analysis by delegations during the period between sessions 1 and 2 of the INC and, thus, facilitate negotiations during INC-2.

It should be noted, however, that while there are working papers and contributions submitted before, during, and after every session of negotiations, there is a lack of structured documentation within the negotiation space to gain a clearer understanding of power dynamics and influencing tactics¹³²³.

In conclusion, at the end of INC-1 there was still a lot of work to do, and a general impression seemed to be shared by many of those present: there is an urgent and enormous problem, and a large number of solutions suggested to overcome it, but still no common ground or agreement on how to translate them into the future treaty¹³²⁴.

- *Second Round: INC-2 Meeting*

From the INC-1 experience, there were many expectations from the participants when moving forward with the negotiation until INC-2. The second session counted with 1.656 attendees, from 169 countries and the EU, and over 300 observer organisations¹³²⁵.

The session was opened with statements from the INC Chair and from several representatives of Member States, passing to item 2 of the agenda¹³²⁶. At this point – starting a discussion that later lasted for almost 3 days – many representatives, drawing attention to Rule 38 of the Draft Rules of Procedure (RoP), stated their understanding that, for the election process of vice-chairs and the designation of a rapporteur to allow for further consultations, voting would be used only as an exception. In this way, the proposed vote on a procedural matter could not set a precedent for the voting to be used

¹³²² UNEP (2022m). *Ob. cit.*, p. 9.

¹³²³ Cowan, E. (2024). *Ob. cit.*, p. 3.

¹³²⁴ Earth Negotiations Bulletin (2022). *Ob. cit.*, p. 7-8.

¹³²⁵ Earth Negotiations Bulletin (2023a). Summary of the Second Meeting of the Intergovernmental Negotiating Committee to Develop an International Legally Binding Instrument on Plastic Pollution: 29 May – 2 June 2023. Available at: <https://enb.iisd.org/sites/default/files/2023-06/enb3612e.pdf>. Accessed on 6 July 2023.

¹³²⁶ Item 2 was “Election of Officers”. In: UNEP (2023k). Provisional Agenda. Organizational matters: adoption of the agenda (UNEP/PP/INC.2/1). United Nations Environment Programme, 6 March 2023. Available at: <https://wedocs.unep.org/xmlui/bitstream/handle/20.500.11822/42199/2304071English.pdf?sequence=1&isAllowed=y>. Accessed on 1 July 2023.

on substantive issues, once they advocated that decisions should be adopted by consensus¹³²⁷.

Going further with the agenda, representatives of States debated the provisional application of the draft RoP and discussed brackets around rules 37 (voting rights) and 38 (adoption of decisions)¹³²⁸.

At the second plenary meeting, the Chair recalled that, with respect to the decision of the INC-1, the Draft RoP would apply to its work provisionally until their adoption, and that their adoption would be deferred until the committee's second session in order to allow more time for consultations. Since further consultations would be needed on the bracketed text in question (for the Rule 37), the draft RoP would continue to be applied on a provisional basis until their adoption, as agreed at INC-1¹³²⁹.

After an extended debate, delegates went into open-ended consultations, and informal discussions, eventually agreeing to an interpretative statement to reflect divergent opinions¹³³⁰.

In parallel, it is interesting noticing that, compared to what has been observed in this plastics treaty process, the Paris Agreement, specifically concerning the RoP, share a similar experience.

When the COP to the UNFCCC launched a process to develop a protocol, another legal instrument or an agreed outcome with legal force under the UNFCCC, that could be applicable to all Parties¹³³¹, the Draft RoP provided have never been adopted because of divergent views on Rule 42, which inside the chapter about voting procedures, refers to the consensus¹³³².

Therefore, since COP-1 in 1995, the adoption of the RoP is among the first items on the COP agenda and it is a common practice for the COP to apply the rules, except for Rule 42. While the adoption of the RoP remains formally an agenda item of the COP, in

¹³²⁷ UNEP (2023l). Report of the intergovernmental negotiating committee to develop an international legally binding instrument on plastic pollution, including in the marine environment, on the work of its second session (UNEP/PP/INC.2/5), 7 July 2023, p. 5. Available at: <https://wedocs.unep.org/bitstream/handle/20.500.11822/42953/FinalINC2Report.pdf>. Accessed on 12 July 2023.

¹³²⁸ Earth Negotiations Bulletin (2023a). *Ob. cit.*, p. 3.

¹³²⁹ UNEP (2023l). *Ob. cit.*, p. 6.

¹³³⁰ Earth Negotiations Bulletin (2023a). *Ob. cit.*, p. 3.

¹³³¹ UN (2023b). Paris Agreement – Procedural History. Audiovisual Library of International Law, Codification Division, Office of Legal Affairs, 2023. Available at: <https://legal.un.org/avl/ha/pa/pa.html>. Accessed on 12 June 2023.

¹³³² UN (1996). Organizational Matters Adoption of The Rules of Procedure (FCCC/CP/1996/2). Framework Convention on Climate Change, Conference of the Parties, Second Session Geneva, 8 - 19 July 1996 - Item 4 (b) of the provisional agenda. Available at: <https://documents-dds-ny.un.org/doc/UNDOC/GEN/G96/617/99/PDF/G9661799.pdf?OpenElement>. Accessed on 12 June 2023.

practice, there is no debate since Parties still have very divergent views on the modality of taking decisions. The result of this gap is that every decision adopted by the COP has been taken applying the practice of consensus since the inaugural session of 1995¹³³³.

The procedural issues of the future plastics LBI were still to be develop in the next sessions, however, it was – at least – disappointing to observe that, in a negotiation that deals with such an urgent issue, the delegates only started to discuss main substantive item of the agenda by the third day of that session¹³³⁴.

By then, two Contact Groups (CGs) were established, using the annex to document UNEP/PP/INC.2/4¹³³⁵ as the guiding source for their work¹³³⁶.

The mandate of CG 1, was to focus on the elements set out in part II, section A, on objective(s); and in part II, section B, on substantive obligations, of the annex to document UNEP/PP/INC.2/4, whereas the mandate of CG 2, was to focus on the elements set out in part II, section C, on means of implementation, in part II, section D, on implementation measures, and in part II, section E, on additional matters, of the annex to the same document. Following the discussions in the CGs, the cofacilitators were to prepare a summary that would constitute the report to plenary on the result of the debates¹³³⁷.

The main point of dispute between delegations on substantive issues was the form in which the instrument would be used to construct a legal mandate. Some countries, such as the USA, China and India, have positioned themselves in favour of the “bottom-up” approach – implying that states would be able to determine their commitments based on their capacity and good faith. Developing countries, in contrast, have defended strong commitments applied to all countries, with common but differentiated responsibilities, considering the legacy of plastic pollution left by developed countries for decades¹³³⁸.

¹³³³ Vihma, A. (2014). How to reform the un climate negotiations? Perspectives from the past, present and neighbour negotiations. 82 FIIA Working Paper, p. 11. The Finnish Institute of International Affairs. Available at: <https://www.files.ethz.ch/isn/184844/wp82.pdf>. Accessed on 15 June 2023.

¹³³⁴ Item 4 of the Agenda: Preparation of an ILBI on Plastic Pollution, including in the Marine Environment. In: UNEP (2023m). Annotated provisional agenda (UNEP/PP/INC.2/1/Add.1). Organizational matters: organization of work, 6 March 2023. Available at: <https://wedocs.unep.org/xmlui/bitstream/handle/20.500.11822/42205/2304072English.pdf?sequence=8&isAllowed=y>. Accessed on 12 July 2023.

¹³³⁵ UNEP (2023b). *Ob. cit.*, n.p.

¹³³⁶ The CGs were established two days later than originally planned, as the first days were occupied by negotiations on procedural issues.

¹³³⁷ UNEP (2023l). *Ob. cit.*, p. 14.

¹³³⁸ Earth Negotiations Bulletin (2023a). *Ob. cit.*, p. 3-8.

Developing countries have also expressed a preference for applying stringent control measures throughout the upstream phase of the plastic cycle. Other countries have preferred to concentrate control measures on the midstream and downstream phases¹³³⁹.

As a result of INC-2, it was proposed by the delegates that the President and the Secretariat of the INC should prepare, in the period between sessions 2 and 3, the “Zero Draft” of the treaty, to support and assist the negotiations during the INC-3.

This “Zero Draft” would include definitions, options and criteria at points along the plastic production chain; identification of the most problematic plastic and polymeric products and those to avoid; design for circularity; substitute and alternative inputs; and methods of implementation. Furthermore, it was requested by delegations that a summary report was prepared taking into account elements that were not present in the options document used in INC-2, such as principles and scope¹³⁴⁰.

Other INC-2 outcomes were the definition of the countries that would host the following INC meetings (Kenya, Canada and South Korea, respectively), and the compilation by the co-facilitators of the work of the two CGs, to be presented before starting INC-3 work, for general knowledge¹³⁴¹.

At the end that session, it remained clear that there is a polarisation between developed and developing countries (the classic North x South dichotomy¹³⁴²) regarding the strength of the instrument, how responsibilities should be distributed among members, when to intervene in the plastics cycle, how to implement and the forms of financing.

While developed countries, major polluters and headquarters of large petrochemical companies that produce plastic, support milder measures, modulated on the basis of voluntary commitments determined by each nation, developing countries ask for more severe measures, including the possibility of banning the plastic, and strong

¹³³⁹ UNEP (2023I). *Ob. cit.*, p. 20.

¹³⁴⁰ Earth Negotiations Bulletin (2023a). *Ob. cit.*, p. 6.

¹³⁴¹ *Ibid.*, p. 3.

¹³⁴² A closer look at its historical origins, evolution, and present-day expression highlights the significant impact of asymmetric power and economic inequality in shaping its normative principles and direction. It is the pursuit of power and economic influence that has led to conflicts of competing interests, historically framed as “civilised” versus “primitive”, or “West” versus “East”, or even “developed” versus “developing”, and the “clash of civilisations”. Currently, this division is referred to as the North–South divide, reflecting disparities in geostrategic and economic power, including the digital divide in the realm of technology. In: Islam, M.R. (2015). History of the North–South Divide in International Law: Colonial Discourses, Sovereignty, and Self-Determination. In: Alam, S.; *et. al.* (eds.). **International Environmental Law and the Global South**. Cambridge University Press, p. 23. DOI: <https://doi.org/10.1017/CBO9781107295414.003>. Available at: <https://www.cambridge.org/core/books/abs/international-environmental-law-and-the-global-south/history-of-the-northsouth-divide-in-international-law-colonial-discoursesovereignty-and-selfdetermination/CF4988C74A64BEA8FCB9E4CC363B92EF>. Accessed on 13 May 2022.

commitments applied to all countries, with a gradation proportional to each one's ability to pollute the planet.

It is known that economically favoured countries tend to exert influence on negotiations. However, it is hoped that, at the end of the process, the main motivation that led to the creation of the treaty will not be forgotten: the protection of nature, of living and non-living elements but also of human health and permanence of life on Earth, preventing that (marine) plastic pollution makes the planet uninhabitable.

The protection of communities, the responsibility of richer countries towards poorer ones, the fight against transboundary marine pollution, especially when located in areas outside the jurisdiction of states, and the sharing of technologies, implementation and financing methods must be stronger than the leverage of capital so that the treaty does not lose its primary objective.

In conclusion, although some might have considered that, at the end of the session, the INC was able to successfully demonstrate its strength¹³⁴³, in reality, when facing a disheartening procedural failure, INC-2 showed that it would be unlikely that negotiations ended by the end of 2024 – as it was initially planned.

- *Third Round: INC-3 Meeting*

This session was held from November 13 to 19, 2023, at the UNEP headquarters in Nairobi, Kenya, and saw over 1900 participants, including delegates from 161 UN Member States¹³⁴⁴.

Unlike the INC-2 session, procedural statements from the UN Member States did not consume valuable time during INC-3. Instead, delegates were eager to move forward with the Zero Draft, initiating substantive discussions on the treaty's content and text as early as the second day of negotiations.

The first step in the treaty negotiation process is developing a draft for delegation review and negotiation, moving beyond pre-prepared statements to engage in discussions on the core issues.

The Zero Draft incorporated submissions from regional groups and individual Member States and was informed by stakeholder inputs. Published on September 4, 2023, the Zero Draft outlined key components of the future global plastics treaty,

¹³⁴³ Earth Negotiations Bulletin (2023a). *Ob. cit.*, p. 8.

¹³⁴⁴ UNEP (2023n). Third Session (INC-3). Available at: <https://www.unep.org/inc-plastic-pollution/session-3>. Accessed on 26 May 2024.

including its primary objectives, core obligations, and implementation measures¹³⁴⁵.

Over seven days of negotiations differing perspectives from UN Member States and regional groups were debated and integrated into the revised treaty drafts. These deliberations occurred in three CGs, each tasked with addressing different parts of the treaty text. The CGs met regularly, often in parallel, and the discussions reflected a range of positions on the treaty's scope.

The Zero Draft, initially 31 pages long, expanded significantly by the end of INC-3, with documents from CGs 1 and 2 exceeding 60 pages¹³⁴⁶.

The CG 3 (which was in charge of Part V “institutional arrangements” and Part VI “final provisions”) did not reach a consensus, and thus its content could not be included within the given timeframe. However, two of the three CGs successfully produced revised drafts in preparation for INC-4, addressing the treaty's objectives, core obligations, and implementation mechanisms.

The future Global Plastics Treaty will not exist in isolation but within a broader landscape of existing regimes and agreements that also address plastic pollution. As seen in previous sessions, divisions persist between countries that view plastic pollution as a matter of reducing primary plastic production and those who see it primarily as a waste management issue – and, in fact, during INC-3 a coalition of countries called the “Global Coalition for Plastics Sustainability” was formed with the goal of supporting a bottom-up approach, where each country would decide its own actions and contributions within the treaty¹³⁴⁷.

The outcome of these debates will ultimately determine whether the treaty adopts top-down legally binding measures or a more voluntary bottom-up approach¹³⁴⁸.

¹³⁴⁵ UNEP (2023o). Zero draft text of the international legally binding instrument on plastic pollution, including in the marine environment (UNEP/PP/INC.3/4). Available at: <https://wedocs.unep.org/bitstream/handle/20.500.11822/43239/ZERODRAFT.pdf>. Accessed on 19 March 2024.

¹³⁴⁶ The full compilation of the revised zero draft text provided by the CG-1 has 73 pages. In: UNEP (2023p). Contact Group 1 – REV Co-facilitators' updated full compilation of the revised zero draft text (19 November 2023, 14.55). Available at: <https://wedocs.unep.org/bitstream/handle/20.500.11822/44069/CG1ZeroDraftCompilation.docx>. Accessed on 13 May 2024.

¹³⁴⁷ Are part of the coalition nations like Russia, China, Iran, Saudi Arabia, Cuba, and Bahrain. They emphasise that the primary focus of the treaty should be on waste management, rather than on production. In: Cowan, E. (2025). *Ob. cit.*, p. 28-29.

¹³⁴⁸ UNEP (2023s). Report of the intergovernmental negotiating committee to develop an international legally binding instrument on plastic pollution, including in the marine environment, on the work of its third session (UNEP/PP/INC.3/5). Available at: <https://wedocs.unep.org/bitstream/handle/20.500.11822/44760/INC3ReportE.pdf>. Accessed on 12 May 2024.

At INC-3, several Member States and intergovernmental organisations emphasised the need for the future treaty to complement existing frameworks, such as the Stockholm Convention (chemicals of concern), Basel Convention (plastic waste trade), and the UNFCCC (climate agreements), ensuring that efforts are not duplicated¹³⁴⁹.

This synergy was a recurring theme in CG-1 discussions. Negotiators acknowledged the need for the new instrument to avoid overlap with existing agreements and to build upon the work that has already been achieved¹³⁵⁰.

In CG-2, delegates focused on financing and implementing the treaty. The negotiations explored options for financing, including the establishment of a new fund, integrating existing financial arrangements such as the Global Environment Fund (GEF), or a hybrid approach combining both. The discussions emphasised the importance of NAPs for implementing global commitments at the national level. However, some countries viewed NAPs as a way to weaken the global strength of the treaty, leaving the responsibility for action to individual nations¹³⁵¹.

CG3 negotiated the opening and closing sections of the future instrument's text, covering elements such as the preamble, definitions, scope, and institutional arrangements¹³⁵².

The lack of consensus on definitions and the scope of the treaty presented challenges, particularly regarding terms like “Extended Producer Responsibility”. A clear definition of EPR is critical to ensuring cooperation on monitoring and reporting. At the same time, some like-minded countries, including Russia, Saudi Arabia, China, Cuba, Iran, and Bahrain, raised concerns about the direction of the negotiations and advocated for pausing discussions due to the unresolved definitions and scope¹³⁵³.

As the session progressed, delegates shifted the focus of CG-3 to institutional arrangements, with most participants agreeing that the governing body of the treaty

¹³⁴⁹ Earth Negotiations Bulletin (2023b). Summary of the Third Session of the Intergovernmental Negotiating Committee to Develop an International Legally Binding Instrument on Plastic Pollution: 11-19 November 2023. Vol. 36, n. 20. Available at: <https://enb.iisd.org/sites/default/files/2023-11/enb3620e.pdf>. Accessed on 30 December 2023.

¹³⁵⁰ UNEP (2023q). Contact Group 1 Co-facilitators' summary of discussions INC-3, Nairobi, 13-19 November 2023. Available at: https://wedocs.unep.org/bitstream/handle/20.500.11822/44081/CG1_Report.pdf. Accessed on 13 January 2024.

¹³⁵¹ Earth Negotiations Bulletin (2023b). *Ob. cit.*, p. 6.

¹³⁵² UNEP (2023r). Guidance for Contact Groups to be established at INC-3 (14 November 2023). Available at: <https://wedocs.unep.org/bitstream/handle/20.500.11822/43991/ContactGroups.pdf>. Accessed on 17 January 2024.

¹³⁵³ Earth Negotiations Bulletin (2023b). *Ob. cit.*, p. 7.

should take the form of a COP, following the model of other environmental agreements¹³⁵⁴.

In conclusion, while remained much work to be done, the path ahead became clearer at this session – INC-3 may not have achieved the level of progress desired by some, but it clarified the areas of common ground and differing perspectives.

- *Fourth Round: INC-4 Meeting*

The fourth session of the INC took place from April 23 to 29, 2024, at the Shaw Centre in Ottawa, Canada – this session came only five months after the INC-3 meeting in Nairobi¹³⁵⁵.

The treaty's broad goals – ending plastic pollution, including in the marine environment – remained the focus of the negotiations. During the early days of the session, optimism ran high, with the end of the process seemingly within reach. The agenda for the week, however, was focused on Part II of the draft treaty text, which listed 13 core obligations that the treaty might include¹³⁵⁶ – which were still a source of disagreement among delegates¹³⁵⁷.

The first day's goal was to quickly move from introductory remarks and pleasantries into substantial discussions, allowing delegates to begin refining the draft treaty text received in late 2023. The plenary session was adjourned by the afternoon, and delegates split into CGs to engage in more focused discussions for the remainder of the week¹³⁵⁸ – the CGs were further divided into more specialised subgroups, a proposal that

¹³⁵⁴ UNEP (2023p). *Ob. cit.*, p. 25.

¹³⁵⁵ UNEP (2024e). Fourth Session (INC-4). Available at: <https://www.unep.org/inc-plastic-pollution/session-4>. Accessed on 16 May 2024.

¹³⁵⁶ Which were related to: 1. Primary plastic polymers; 2. Chemicals and polymers of concern; 3. Problematic and avoidable plastic products, including short-lived and single-use plastic products and intentionally added microplastics; 4. Exemptions available to a Party upon request; 5. Product design, composition and performance; 6. Non-plastic substitutes; 7. Extended producer responsibility; 8. Emissions and releases of plastic throughout its life cycle; 9. Waste management; 10. Trade [in listed chemicals, polymers] and products, and in plastic waste][related measures]; 11. Existing plastic pollution, including in the marine environment; 12. Just transition; and 13. Transparency, tracking, monitoring and labelling. In: UNEP (2023i). *Ob. cit.*, p. 3.

¹³⁵⁷ Earth Negotiations Bulletin (2024a). Summary of the Fourth Session of the Intergovernmental Negotiating Committee to Develop an International Legally Binding Instrument on Plastic Pollution: 23-29 April 2024. Vol. 36, n. 27, p. 12. Available at: <https://enb.iisd.org/sites/default/files/2024-05/enb3627e.pdf>. Accessed on 17 July 2024.

¹³⁵⁸ UNEP (2024f). Report of the intergovernmental negotiating committee to develop an international legally binding instrument on plastic pollution, including in the marine environment, on the work of its fourth session (UNEP/PP/INC.4/5). Available at: https://wedocs.unep.org/bitstream/handle/20.500.11822/45872/INC4_Report.pdf. Accessed on 10 May 2024.

led to confusion among delegates about the process, and many questions arose about the reasons for further dividing the text¹³⁵⁹.

This organisational issue was eventually resolved by the Chair, who recommended that such discussions take place in the CGs instead of in plenary, allowing the focus to shift to more substantive matters.

Once the plenary session moved into the CGs, the goal was to conduct an initial review of the draft text, allowing facilitators to gain approval for streamlining the text further. Some time was spent discussing the format of the process, but discussions soon shifted to the core substantive elements, with the chairs requesting mandates to begin removing duplicate text and merging similar sections¹³⁶⁰.

The objective of the chairs of the two CGs, along with the co-facilitators of the five subgroups, was to proceed with actual line-by-line textual negotiations as soon as the text had been revised and streamlined for each section. In its original form, coming from INC-3, the text was filled with options and bracketed text from delegations, many of which were similar or redundant.

The aim was to streamline the text, making it easier to manage during the negotiations and allowing the final round of discussions to focus entirely on line-by-line negotiations. The structure of the negotiations involved parallel discussions on various topics in different subgroups, which would then be condensed into a more manageable text to serve as the foundation for the negotiations in November¹³⁶¹.

Despite the efforts of the co-chairs to streamline the text during the seven days of negotiations in Canada, significant divergent positions remained. Even after the co-chairs had worked to simplify the text in each subgroup, there was not enough time to engage in full line-by-line negotiations across all sections – the text shows the division in opinions, with various options (e.g., OP1, OP2bis) proposed by delegates, and square brackets indicating disagreement on certain words, sentences, or entire paragraphs¹³⁶².

A look at how the treaty text evolved during INC-4 shows a reduction in the overall number of pages and options in the draft text from the initial document of INC-3. However, the amount of bracketed text (*i.e.*, text still under negotiation) significantly increased from the start to the end of INC-4, indicating that reaching consensus on key

¹³⁵⁹ Earth Negotiations Bulletin (2024a). *Ob. cit.*, p. 3.

¹³⁶⁰ UNEP (2024f). *Ob. cit.*, p. 6.

¹³⁶¹ Earth Negotiations Bulletin (2024a). *Ob. cit.*, p. 4.

¹³⁶² UNEP (2023i). *Ob. cit.*, p. 24.

issues would be a challenge – to adopt the treaty, all text must be agreed upon, and no brackets can remain.

There were areas of convergence that emerged in the session – such as on plastic waste management and just transition. Regarding Part I (preamble, objective, definitions, principles, and scope), negotiators agreed on the mandate to “end plastic pollution” but struggled with differing interpretations of its meaning, particularly regarding waste management versus addressing the full lifecycle of plastics¹³⁶³.

Part II, covering core obligations, saw major divisions, especially over the inclusion of primary plastic polymer production limits, with disagreements from oil-producing nations. Other sharp divergences included financing, EPR and, notably, the scope of the agreement¹³⁶⁴.

Part III focused on financing, capacity building and technology transfer, emphasising support for developing countries and the need for financial mechanisms; Part IV dealt with institutional matters, including progress reporting and international cooperation; and Part V addressed governance and implementation¹³⁶⁵.

At the end of the session, it was agreed to use the compilation of this session’s work as a basis for negotiations at the next meeting and a legal drafting group was established to begin work on INC-5 to ensure legal clarity of the new legal instrument on (marine) plastic pollution¹³⁶⁶.

- *Fifth Round: INC-5 Meeting*

The fifth round (or its first part) – which should end the negotiation process – was a decisive moment. It took place from 25 November to 1 December 2024, in Busan, Republic of Korea and was attended by over 3.300 participants from more than 170 countries and 450 organisations, underscoring the global commitment to addressing plastic pollution. Interestingly, a total of 220 lobbyists from the fossil fuel and chemical industries were registered to attend INC-5, marking the highest number observed at any plastics treaty negotiation – surpassing the previous record of 196 lobbyists identified at INC-4¹³⁶⁷.

¹³⁶³ UNEP (2023i). *Ob. cit.*, p. 11.

¹³⁶⁴ Earth Negotiations Bulletin (2024a). *Ob. cit.*, p. 1-6.

¹³⁶⁵ UNEP (2023i). *Ob. cit.*, p. 7-11.

¹³⁶⁶ Earth Negotiations Bulletin (2024a). *Ob. cit.*, p. 8-11.

¹³⁶⁷ Center for International Environmental Law (2024c). Fossil Fuel Lobbyists Flood Final Scheduled Round of Global Plastics Treaty Negotiations. Available at: <https://www.ciel.org/news/inc-5-lobbyist-analysis/>. Accessed on 12 January 2025.

According to the agenda, delegates were expected to work in four CGs and produce a substantive draft of the international LBI by 29 November 2024¹³⁶⁸. This would have allowed the Legal Drafting Group to review the draft before negotiators aimed to adopt it by Sunday, 1 December 2024. However, the process was slower than anticipated, and no text was finalised.

The three main areas of disagreement were: hazardous products and chemicals in plastic products; supply; and finance, including the establishment of a financial mechanism. The draft articles regarding these subjects, proposed in the 3rd Non-Paper provided by the Chair of the Committee were written as follows

Article 3 – Plastic products and chemicals of concern as used in plastic products.

I have heard **support for management of plastic products, including the elimination from the market of some products, and the avoidance of certain chemicals of concern in plastic products**, as being essential in protecting the environment and human health from plastic pollution.

However, beyond that general recognition and agreement, **I have not detected sufficient convergence to suggest draft text.** (...)

I note that many national and regional initiatives globally have eliminated some plastic products and banned some chemicals of concern in their manufacture, or are restricting their use, but **these efforts are fragmented**.

One concern that has been raised with me is that **all countries, while sharing similar high ambition, do not share the same legal and administrative structures or national circumstances**, that would allow for a “one size fits all” approach to plastic products, including with regard to certain chemicals of concern as used in plastic products. This suggests to me that **we need to include considerations that combine the level of ambition with flexibility in approaches at the national level**.

A further concern that has been expressed is the need to avoid delaying initial action until after COP1: this suggests that initial lists of plastic products and/or chemicals of concern as used in plastic products to be controlled, could allow Members and industry to take early action including before, and in anticipation of, entry into force.

The article could include:

- Initial list or lists of plastic products to be controlled, to be contained in an annex or annexes.
- Some exclusions or exceptions may need to be reflected.
- A list of measures that could be applied to plastic products.
- Criteria that could be applied to identify additional plastic products or chemicals of concern as used in plastic products.
- Possible linkage to applications.
- Process for the Conference of the Parties (COP) to identify further plastic products and chemicals of concern as used in plastic products to be subject to control, including process to review the lists.
- References to:
 - National circumstances and capabilities;
 - Procedure for amending annexes;
 - Transparency and traceability.

¹³⁶⁸ UNEP (2024g). Annotated provisional agenda – Fifth session of the Intergovernmental negotiating committee to develop an international legally binding instrument on plastic pollution, including in the marine environment (UNEP/PP/INC.5/1/Add.1). Available at: https://wedocs.unep.org/bitstream/handle/20.500.11822/46385/Annotated_Provisional_Agenda_E.pdf. Accessed on 16 January 2024.

- Additional measures that could be taken by a Party, including in relation to:
 - Product design, re-use, recyclability of products;
 - Alternatives and non-plastic substitutes. (...)

Article 6 – Supply.

(...) I propose that **INC-5 agrees on text that includes a process to address the current information gaps regarding existing and needed levels of production, as well as the lack of clarity about efficiency and effectiveness in recovering plastic polymers.**

This article could:

- Acknowledge the **need to manage the supply of primary polymers to achieve sustainable levels of production and consumption of plastics through their life cycle.**
- Encourage Parties to take **measures to promote sustainable production and consumption** of plastics throughout their life cycle.

This article could require:

- Parties to **cooperate to achieve a global objective** of sustainable levels of production.
- **Reporting on production of primary and secondary plastic polymers.**
- Decision on the need for further action at a later meeting of the Conference of the Parties.
- Keeping under review the measures and objectives set out in this article.

Article 11 – Finance, Including the Establishment of a Financial Mechanism.

(...) I expect that this Article would, *inter alia*:

- Require each Party to mobilise, within its capabilities, resources in respect of those national activities that are intended to implement this Convention, in accordance with its national policies, priorities, plans and programmes.
- Recognize that the ability of some Parties to implement some legal obligations effectively under this Convention will depend on the availability of capacity-building and technical and adequate financial assistance.
- **Define a mechanism for the provision of financial and technical cooperation to such parties to assist their compliance with the control measures of the Convention.** The mechanism could:
 - Include one or more funds;
 - Be operated by one or more entities;
 - Include entities providing multilateral, regional and bilateral financial and technical assistance;
 - Include contributions from the private sector.
- Recognize that **the financial mechanism will provide new and additional resources within a broader landscape of existing financial flows including from domestic finance, bilateral, regional, and multilateral entities, and the private sector.**
- Designate the Conference of the Parties to provide overall policies and guidance for the mechanism.
- Invite Parties to contribute resources through a mechanism.
- Require the Conference of the Parties at its first meeting to decide on the institutional arrangements of the mechanism.
- Require the Conference of the Parties to review the effectiveness of the mechanism, **its ability to address the changing needs of the developing country Parties and Parties with economies in transition**, the level of funding available through the mechanism, and the **effectiveness of the performance of any institutional entities entrusted to operate the mechanism.**
- Catalyze and align public and private financial flows with the objective and provisions of the Convention.

- The financial mechanism is established on entry into force of the Convention - the Conference of the Parties can decide the operational modalities.¹³⁶⁹(*author's emphasis*)

For drafts of Article 3 and Article 6, negotiators' opinions varied widely. Some proposed excluding these issues from the LBI entirely (a stance supported by the Like-minded countries and the Arab Group)¹³⁷⁰, while others suggested listing harmful products and chemicals to be banned in plastic products, setting a global target for reducing primary plastic polymers to sustainable levels, and promoting a circular economy throughout the entire plastics lifecycle (a position supported by the High Ambition Coalition and other "willing countries")¹³⁷¹.

On Article 11, the shared viewpoint was the need for a dedicated, autonomous financial mechanism primarily funded by developed countries, which would support the treaty's implementation in developing nations. Others proposed a financial mechanism funded by all parties and additional sources, including the private sector¹³⁷².

The INC also failed to reach an agreement on less divisive issues like waste management¹³⁷³. During the plenary on Wednesday, November 27, many negotiators voiced frustration with the delaying tactics employed by the "Like-Minded Countries" group¹³⁷⁴ – as it was felt that they were blocking progress by stressing "*that all decisions on substantive issues shall be made by consensus*"¹³⁷⁵.

In an effort to resolve the impasses, on Friday, November 29, the Chair of the Committee interrupted the CGs work and initiated informal closed-door consultations.

¹³⁶⁹ UNEP (2024h). Non-Paper 3 of the Chair of the Committee. Available at: https://wedocs.unep.org/bitstream/handle/20.500.11822/46483/Non_Paper_3_E.pdf. Accessed on 22 December 2024.

¹³⁷⁰ Earth Negotiations Bulletin (2024b). Summary of the First Session of the Fifth Session of the Intergovernmental Negotiating Committee to Develop an International Legally Binding Instrument on Plastic Pollution: 25 November – 2 December 2024. Vol. 36, n. 34, p. 3-8. Available at: <https://enb.iisd.org/sites/default/files/2024-12/enb3634e.pdf>. Accessed on 06 January 2025.

¹³⁷¹ France, Rwanda, and Mexico are leading a coalition of 95 "willing countries" advocating for legally binding measures to phase out harmful plastic products and chemicals. In: UNEP (2024i). HAC Member States Ministerial Joint Statement for INC-5. Available at: https://resolutions.unep.org/incres/uploads/final-hac-ministerial-joint-statement-for-inc-5-for-publication-67-members_0.pdf. Accessed on 16 January 2025.

¹³⁷² UNEP (2025b). Draft report of the intergovernmental negotiating committee to develop an international legally binding instrument on plastic pollution, including in the marine environment, on the work of the first part of its fifth session (UNEP/PP/INC.5/8). Available at: https://wedocs.unep.org/bitstream/handle/20.500.11822/47162/INC_5_1_Report.pdf. Accessed on 20 February 2025.

¹³⁷³ *Ibid.*, p. 9.

¹³⁷⁴ UNEP (2024j). Opening Statement for INC-5 on Behalf of Like-Minded Countries. Available at: https://resolutions.unep.org/incres/uploads/kuwait_on_behalf_of_like-minded_countries_0.pdf. Accessed on 02 January 2025.

¹³⁷⁵ Earth Negotiations Bulletin (2024b). *Ob. cit.*, p. 3.

Based on feedback from delegates, the Chair produced a new informal document (the 4th Non-Paper) circulated later that evening¹³⁷⁶.

Informal consultations continued Saturday, November 30, with rumours circulating about the possibility of a second part of INC-5 or an extension of the current meeting until Tuesday, December 3, 2024. On Sunday afternoon, December 1st, the Chair made public a fifth version of his informal document (the Chair's Text)¹³⁷⁷. During the final plenary session on Sunday evening, delegates decided to adjourn the negotiations until 2025, accepting the new text as a basis for future discussions¹³⁷⁸.

Overall, delegates engaged in complex discussions regarding whether plastic products, chemicals of concern, and issues related to plastic supply and production fell within the INC's mandate. Limited progress was made in discussions on financing. A central issue underlying all debates was whether the future treaty would adopt mandatory or voluntary measures, and whether these measures would be implemented at the global or national level¹³⁷⁹.

These debates set the stage for the second part of INC-5¹³⁸⁰, which took place in Geneva, Switzerland, from 5 to 15 August 2025, bringing together more than 2.600 delegates from 183 Member States and 400 observer organisations. Participants included environmental groups, waste pickers, Indigenous Peoples, youth representatives, as well as lobbyists from the fossil fuel and chemical industries. The session also saw the participation of 70 Ministers and Vice Ministers, alongside 30 other high-level officials, who engaged in informal roundtables on the margins of the negotiations¹³⁸¹.

At the opening of the session (5 August), INC Chair Vayas drew attention to the Chair's Text circulated on 1 December 2024¹³⁸², noting that it would serve as the basis

¹³⁷⁶ UNEP (2024k). Non-Paper Containing Draft Text of the Chair of the Committee. Available at: https://wedocs.unep.org/bitstream/handle/20.500.11822/46705/Chair_Proposal.pdf. Accessed on 07 January 2025.

¹³⁷⁷ UNEP (2024l). Chair's Text (1 December 2024). Available at: https://wedocs.unep.org/bitstream/handle/20.500.11822/46710/Chairs_Text.pdf. Accessed on 12 January 2025.

¹³⁷⁸ UNEP (2025b). *Ob. cit.*, p. 13.

¹³⁷⁹ Earth Negotiations Bulletin (2025). Summary of the Resumed Fifth Session of the Intergovernmental Negotiating Committee to Develop an International Legally Binding Instrument on Plastic Pollution, including in the Marine Environment: 5-15 August 2025. Vol. 36 No. 43, Monday, 18 August 2025. Available at: <https://enb.iisd.org/sites/default/files/2025-08/enb3643e.pdf>. Accessed on 22 August 2025.

¹³⁸⁰ During the intersessional period, Heads of Delegation met informally in Nairobi, Kenya, from 30 June to 2 July 2025. The meeting provided an opportunity for states to enhance mutual understanding and explore potential pathways forward. Delegates also addressed the modalities and organisational arrangements for INC-5.2. In: UNEP (2025c). Informal Heads of Delegation Meeting. 30 June - 2 July 2025, Nairobi, Kenya. Available at: <https://www.unep.org/inc-plastic-pollution/session-5.2/hods>. Accessed on 20 August 2025.

¹³⁸¹ Earth Negotiations Bulletin (2025). *Ob. cit.*, p. 1.

¹³⁸² See *supra* note 1375.

for negotiations. He recalled the structure of the four CGs established during the previous session, confirmed their continuation, and announced new co-chairs for Groups 2 and 4.

He requested that each group produced a draft text by 8 August, after which the Secretariat would compile an assembled document to be considered by the INC. Provisions reflecting areas of convergence were to be forwarded to the Legal Drafting Group¹³⁸³.

From 9 August onwards, discussions centred on the Assembled Text (UNEP/PP/INC.5/CRP.15)¹³⁸⁴, which integrated outcomes from the CGs together with proposals from co-chairs, co-facilitators, and delegations. Presented during a stocktaking plenary, this document was described as a “snapshot” of the state of negotiations as of 8 August¹³⁸⁵.

On process, Chair Vayas proposed reconvening the CGs to review the articles with the aim of transmitting refined drafts to the Legal Drafting Group, while continuing to work with the co-chairs to identify outstanding areas of divergence. Although several delegations called for revising working modalities – including the use of closed meetings reporting back to plenary – the negotiations largely proceeded within the contact and informal groups, which repeatedly emphasised the need for additional time to make progress¹³⁸⁶.

The Table below provides a summary of the main divergencies identified¹³⁸⁷ – across nearly all articles of the text:

Table 6 – Summary of divergences

Points of divergence	Main divergence
Preamble: it was addressed by CG 4. The group discussed whether it should refer to: the full plastics life cycle; UNEA Resolution 5/14; human and Indigenous Peoples rights; and the responsibilities of businesses.	Several delegates argued that the preamble would be better assessed after settling the substantive parts of the treaty, rather than as a stand-alone section.
Art. 1 – Objective (CG 4) “to protect human health and the environment from plastic pollution, including in the marine environment [based on a comprehensive	No agreement on full life-cycle coverage and whether to “address/end/combat” plastic pollution.

¹³⁸³ UNEP (2025d). Draft report of the intergovernmental negotiating committee to develop an international legally binding instrument on plastic pollution, including in the marine environment, on the work of its resumed fifth session (UNEP/PP/INC.5/L.2). Available at: https://resolutions.unep.org/incres/uploads/inc_5.2_report.pdf. Accessed on 20 August 2025.

¹³⁸⁴ UNEP (2025e). Assembled text. UNEP/PP/INC.5/CRP.1. Available at: https://resolutions.unep.org/incres/uploads/k2512852e_-_unep-pp-inc-5-crp.1_-_amended_final.pdf. Accessed on 23 August 2025.

¹³⁸⁵ Earth Negotiations Bulletin (2025). *Ob. cit.*, p. 4.

¹³⁸⁶ UNEP (2025d). *Ob. cit.*, p. 5-10.

¹³⁸⁷ This table was prepared based on the conference reports and official documents, with particular reliance on the Assembled Text (UNEP/PP/INC.5/CRP.1) made available during the negotiations.

approach that address the full life cycle of plastics].”	
Scope (CG 1) (there was no proposed language in the Chair’s Text)	Discussions on whether to include a stand-alone scope article and any exclusions; placeholder added.
Art. 1bis – Principles and approaches (CG 4)	Four options (including delete this article); split over “principles and approaches” vs principles only.
Art. 2 – Definitions (CG 1)	Divergencies on whether “plastic pollution” is waste-only or includes releases/emissions across life cycle; if it is or not linked to “adverse effects on human health and the environment”.
Art. 3 – Plastic products (CG1)	Divergence on whether the article should be binding or voluntary; national vs global measures; global list of products/chemicals with amendment process and criteria; roles of COP/bodies; reporting.
Art. 4 – Exemptions (CG 1)	Taken with Art. 3; joint proposal (85 countries) on phase-outs with extended periods; no line-by-line.
Art. 5 – Product design (CG 1)	Divergence on whether to establish binding or voluntary national measures; aims (circularity, reuse/recycling, toxic-free etc.); COP guidance; trade clause; additives/microplastics; no convergence.
Art. 6 – Supply and sustainable production (CG 1)	Split between global sustainable production and consumption target with national measures/reports vs deleting the article.
Art. 7 – Releases and leakages (CG 2)	Title fully bracketed; divergence on whether to reference “full plastics life cycle”.
Art. 8 – Plastic waste management (CG 2)	Divergence on the mandatory or voluntary nature of the obligation to promote EPR and to take measures to guarantee that plastic waste is managed in an environmentally sound manner (ESM); relationship with Basel Convention; more time needed.
Art. 9 – Existing/legacy pollution (CG 2)	Divergence on existing vs legacy coverage; binding vs voluntary; proposed remediation mechanism; article retitled.
Art. 10 – Just transition (CG 2)	Divergence on whether to have a stand-alone article vs split it into two; whether binding; mention positive impacts; more time needed.
Art. 11 – Financial mechanism (CG 3)	Divergence on whether to establish a new fund vs designation of the Global Environment Facility (GEF) as the interim financial mechanism vs hybrid approach.
Art. 12 – Capacity-building, Technical Assistance and technology transfer (CG 3)	Divergence on whether technology transfer should be “voluntary” or “on mutually agreed terms” or “on concessional terms”; mixed views on a dedicated cooperation mechanism.
Art. 13 – Implementation & compliance (CG 4)	Links to finance and committee membership debated.
Art. 14 – National plans (CG 4)	Divergence on whether plans should be binding or voluntary; description/start date/legal status unresolved; co-facilitators’ text as basis.
Art. 15 – Reporting (CG 4)	Regular reporting to COP per national plans; developing countries’ implementation depends on means of implementation.
Art. 16 – Effectiveness evaluation (CG 4)	Regular COP evaluations (first ≤6 years after entry into force); evaluation should not create new obligations; base on support (Arts 11-12) and life-cycle indicators.
Art. 17 – Information exchange (CG 4)	Exchange on best practices/research/impacts; add “free, prior, and informed consent” and source identification; health/environment info not confidential.
Art. 18 – Public information, awareness, education and research (CG 4)	Research and development encouraged; debates on making it binding, Indigenous/local knowledge wording, and business reporting; no agreement reached.

Art. 19 – Health (CG 4)	Mainstreaming <i>vs</i> stand-alone article; new text on scientific cooperation and evidence-based policy; title bracketed.
Art. 20 – COP (CG 4)	Divergence on the consensus to adopt rules; fallback proposal (majority/ two-thirds) opposed; no deal.
Art. 20bis – Subsidiary bodies (CG 4)	Discussions about how COP 1 shall establish scientific/technical body(ies); fully bracketed, work ongoing.
Art. 21 – Secretariat (CG 4)	Divergence on whether UNEP should be designated as the secretariat/ this could be agreed at COP 1 and excluded from the text.
Art. 22 – Dispute settlement (CG 4)	Negotiation/peaceful means; ICJ/arbitration options; many sought to delete the conciliation commission.
Art. 23 – Amendments (CG 4)	Strive for consensus; $\frac{3}{4}$ vote as last resort bracketed; voting split persists.
Art. 23bis – Relationship with other agreements (CG 4)	Debates on the implementation of the rights and obligations of the parties under this treaty, which shall be “without prejudice” to rights and obligations under other treaties (including trade agreements); whether to fold into other articles.
Art. 24 – Annexes (CG 4)	Entire article bracketed; to revisit after annex talks; no further progress.
Art. 25 – Right to vote (CG 4)	Clarifying rights of regional economic integration organisation; whether each member State must be “accredited and present”.
Art. 26 – Signature (CG 4)	Consider deleting regional economic integration organisations as possible signatories.
Art. 27 – Ratification (CG 4)	Same regional economic integration organisations question as Art. 26.
Art. 28 – Entry into force (CG 4)	Mandated but not negotiated due to time.
Art. 29 – Reservations (CG 4)	Discussed specific product reservations, national-security carve-out, and ability to make reservations.
Art. 30 – Withdrawal (CG 4)	Withdrawal period; forwarded to plenary then to Legal Drafting Group, cleared unchanged.
Art. 31 – Depositary (CG 4)	Forwarded to plenary and Legal Drafting Group.
Art. 32 – Authentic texts (CG 4)	Forwarded to plenary and Legal Drafting Group.

Amidst the numerous divergences, delegates sought to better understand each other’s positions and, in the process, expanded the original text, achieving only limited progress toward a new treaty.

Ultimately, INC Chair Luis Vayas had little choice but to – *once again* – adjourn the session, announcing that a further resumed meeting would be scheduled at a later date, though it remained unclear which draft text would serve as the basis for continued negotiations¹³⁸⁸.

As a result, INC 5.2 did not succeed in producing an ambitious final text – although the day “*14 August 2025 was not only a deadline but an opportunity for achievement*”¹³⁸⁹.

¹³⁸⁸ Earth Negotiations Bulletin (2025). *Ob. cit.*, p. 8-11.

¹³⁸⁹ In his opening statement, Mr. Vayas Valdivieso (Chair of the intergovernmental negotiating committee) recalled the common mission that had brought participants to Geneva: to carry forward and complete the work collectively initiated by their countries. In: UNEP (2025d). *Ob. cit.*, p. 2.

The objective of ending (marine) plastic pollution has encountered another setback, yet it remains attainable. The current moment calls for reflection, reassessment of positions, and identification of areas of common ground or potential compromise.

The negotiation process remains characterised by significant uncertainty, as several key issues are yet to be resolved. Although expectations for a highly ambitious agreement have been gradually tempered, there remains a prevailing hope that, once adopted, the treaty will retain sufficient flexibility to evolve and progressively strengthen over time. This would follow the trajectory observed in other MEAs – such as the Montreal Protocol, the Basel Convention, and the Convention on Biological Diversity – which have, within their respective domains, expanded and reinforced their commitments through subsequent amendments and additional protocols.

3.1.2.2 *What to expect for the final version of the Legally Binding Instrument: guaranteeing a Just and Inclusive Transition?*

Most treaties typically take around five years to negotiate¹³⁹⁰; so, the plastics treaty was given an exceptionally ambitious mandate, with expectations for its conclusion within just two years. This meant delegates would need to collaborate efficiently, and compromises would likely be necessary – particularly on the more contentious issues. However, in practice, this level of cooperation and compromise did not materialise.

With (*hopefully*) only one session remaining to conclude the negotiation process, it is appropriate to speculate on the future of the treaty. This thesis has examined various aspects of the treaty, from its overall structure to its specific provisions, highlighting several critical points that have emerged throughout the investigation.

The treaty negotiations have exposed significant divisions among countries on key issues, such as the scope of the treaty, restrictions on plastic production, regulation of toxic chemical additives in plastics, and funding for treaty implementation in the regions most impacted. These unresolved conflicts are obstructing progress towards a comprehensive treaty that could safeguard human and environmental health throughout the entire plastic lifecycle, from production and design to disposal¹³⁹¹.

Most measures focus on waste management and the downstream aspects of the plastic lifecycle, with relatively few addressing upstream issues like plastic production. The current mix of policies is unbalanced, prioritising waste management over production reduction, and many proposals lack clear implementation strategies.

While addressing waste management is important, scientists agree that limiting virgin plastic production is crucial to tackling plastic pollution. However, limiting production raises complex questions about fairness, global limits, and who should reduce production. Some countries – particularly oil producers – resist limiting plastic production, as it threatens their economic interests¹³⁹².

¹³⁹⁰ MEAs have taken varying lengths of time to negotiate treaty text, influenced by a variety of factors, with durations ranging from just over a year to nearly five years between the initiation of negotiations and the adoption of the treaty. Additionally, depending on the number of countries needed for ratification, it is common for several years to elapse between the adoption of the treaty and its entry into force.

¹³⁹¹ Bowyer, C.; Fletcher, S. (2025). We need a global agreement to safeguard human health from plastic pollution. *BMJ*, vol. 388, p. 1. DOI: <http://doi.org/10.1136/bmj.q2890>. Available at: <https://www.bmj.com/content/bmj/388/bmj.q2890.full.pdf>. Accessed on 25 January 2025.

¹³⁹² A potential solution could be a cap-and-trade system for plastic production, similar to emissions trading schemes. However, this alone cannot address the broader systemic challenges of the plastic crisis. In: Dreyer, E.; *et. al.* (2024). *Ob. cit.*, p. 26-27.

The process mirrors the lengthy journey of international climate negotiations, where economic interests, particularly those of oil- and gas-producing countries, complicate efforts to tackle the root causes of global challenges.

Another important factor to wonder is how (and if) the treaty will effectively guarantee a just and inclusive transition – an important point to be questioned, considering that many Indigenous representatives have felt excluded from participating in the process¹³⁹³.

Establishing controls for a just transition for the informal sector would safeguard workers' labour and human rights, as global, national, and local interventions – particularly the implementation of policies like EPR and deposit return schemes – could disrupt the livelihoods of these communities.

These policies should be developed through close collaboration between governments and stakeholders, ensuring the integration of the informal sector into the waste management system and relevant policy discussions. This approach would also support the creation of effective policies to improve income, working conditions, and protect the health and human rights of these communities.

A just transition, framed within a human-rights-based approach, creates opportunities for all. Beyond the climate context, there are important intersections between environmental concerns, biodiversity protection, and achieving just transitions across various sectors tied to plastics and the entire plastics value chain.

A socially inclusive just transition is essential, for instance, for aligning with the Paris Agreement's NDCs and the development of comprehensive policies and measures that support social, environmental, and economic integration.

The Global Plastics Treaty should elevate just transition from a secondary concern to a central guiding principle for the CE transition by incorporating holistic, ethical solutions that benefit both people and the planet. This can be achieved by maintaining a dedicated article on just transitions in the treaty text and mainstreaming just transitions

¹³⁹³ For some “stakeholders” being excluded from the discussions at such a critical juncture sent a troubling message. During a press conference held by the International Indigenous Peoples' Forum on Plastics, Indigenous representatives emphasised, “*We have been silenced and strategically undervalued*” throughout these negotiations. One delegate stated, “*How can you speak of a just transition when we are not given a seat at the table?*”. Another delegate remarked, “*We are rights holders in this process*” and further asserted, “*This treaty must ensure not only our participation in the negotiations but also in the implementation of measures to address the growing plastic pollution crisis, which disproportionately impacts our communities, our people, and Mother Earth*”. In: Earth Negotiations Bulletin (2024c). Plastic Pollution INC-5 Highlights: Saturday, 30 November 2024. Vol. 36, n. 33, p. 1. Available at: <https://enb.iisd.org/sites/default/files/2024-11/enb3633e.pdf>. Accessed on 07 January 2025.

throughout the treaty, from binding and voluntary requirements to reporting, oversight, and compliance mechanisms.

A just transition to a more sustainable and circular plastics economy will affect workers and communities in various ways, making it crucial to provide support for displaced workers and impacted communities to ensure a fair and equitable transformation.

In parallel, it is expected that the final text of the treaty will introduce the most ambitious regulatory framework possible, including legally binding rules that address the entire life cycle of plastics: from the production of virgin plastic to problematic polymers, from chemicals of concern to product design, and extending to corporate responsibility and waste management. Such a comprehensive approach would allow plastic pollution to be effectively tackled on a global scale.

It is also possible, however, that the treaty will reflect a “medium” level of ambition, establishing global standards for the design of durable plastic products, some limitations on plastic production, and restrictions on hazardous chemicals, alongside measures for waste management. A lower level of ambition, by contrast, would allow individual countries or regions to regulate their plastic waste independently, focusing exclusively on the downstream aspects of pollution while neglecting the upstream issues related to production and waste generation.

This variability in negotiating ambition also reflects a shift in perspective in the discussions: whereas UNEA Resolution 5/14 was negotiated primarily by environmental ministries, the current negotiations are being led by energy ministries. This has resulted in the treaty being largely considered as an economic instrument, with proposals concerning targets and measures for sustainable plastic production and consumption, and for the restriction of problematic plastic products being largely rejected.

Consequently, negotiations may continue, but without a significant shift in positions, achieving a positive outcome appears unlikely. Narrowing the scope of the treaty – by excluding upstream production issues – or lowering its level of ambition could facilitate agreement adoption, but this would produce a weaker instrument compared to the vision originally envisaged by UNEA. In such a scenario, the treaty’s structural provisions could be less robust than those of the Paris Agreement, with a potentially

limited overall impact. Alternatively, more ambitious states might attempt to advance the treaty through a voting procedure¹³⁹⁴.

Despite these challenges, the treaty represents a historic opportunity to end (marine) plastic pollution and protect both human health and the environment. For this reason, it is expected that the final outcome will pursue the highest possible ambition, ensuring a balance between environmental protection, economic sustainability, and social justice.

¹³⁹⁴ During the negotiations, all delegations agreed that consensus should remain the norm. However, 120 countries supported the introduction of a “safety mechanism”: if consensus could not be reached, decisions could be adopted by majority vote, without any state holding veto power. High voting thresholds – such as a three-quarters majority – were proposed to prevent abuse. Nonetheless, Brazil, Russia, India, and China strongly opposed this solution, insisting that decisions be made exclusively by consensus. Without the possibility of resorting to voting as a last resort, many feared that the treaty could remain paralysed, limiting its capacity to strengthen over time. In: UNEP (2025d). *Ob. cit.*, p. 5-10.

Synthesis of the chapter

This chapter provides an in-depth examination of the context of the complex negotiations surrounding the development of a global LBI to tackle (marine) plastic pollution, highlighting key issues regarding the treaty's structure, the negotiation rounds and the unresolved issues that have shaped the treaty process, and expectations for its final version.

In this scenario, ocean diplomacy plays a pivotal role, bridging scientific research, environmental policies, and international cooperation. The growing awareness of the environmental and health risks posed by plastic pollution, especially in marine environments, has prompted countries to collaborate on finding global solutions. The integration of ocean science into policy has strengthened the diplomatic approach, with scientific findings on the extent of plastic pollution in the ocean acting as a catalyst for international engagement.

The work of scientific bodies and institutions, such as the UNEP, has informed the negotiations, ensuring that discussions are guided by credible data on the severity and global impact of plastic pollution. This cross-cutting integration of science into diplomacy is central to building consensus on ambitious policies aimed at reducing plastic production, waste, and the detrimental impact on marine ecosystems.

Ocean diplomacy has thus become integral to the process, enabling countries to come together, sharing knowledge, establishing common objectives, and committing to joint actions. As a result, the treaty framework has been shaped by the goal of reducing plastic waste entering the ocean, ultimately contributing to broader environmental protection and sustainable development.

According to the UNEA mandate, the treaty's structure should be designed to address the entire lifecycle of plastics, encompassing production, design, waste management, and recycling. It aims to create a global framework for managing plastic pollution while allowing flexibility for national and regional contexts. At its core, the treaty seeks to impose legally binding commitments on plastic production, the design of products, the regulation of toxic chemical additives, and mechanisms for waste management.

Fundamental components of the treaty should include scope and objectives addressing from the upstream plastic production to downstream waste management, focusing on reducing plastic pollution at every stage of the plastics lifecycle.

In addition, obligations should require that countries implement national policies aligned with the global goals of the treaty, with flexibility for each nation based on their

context. A central financial provision would also need to be included in order to support the transition in developing countries, ensuring that the treaty's provisions are globally inclusive. Finally, the treaty should establish a governing body responsible for overseeing compliance, monitoring progress, and ensuring accountability through reporting and review mechanisms.

This comprehensive structure would balance global ambition with national sovereignty, ensuring that all countries can participate in and benefit from the treaty, regardless of their economic status or geographic location.

The negotiation sessions, however, show a different scenario for the final text. They have unfolded in several rounds, each shaping the trajectory of the treaty. The early rounds (INC-1 and INC-2) focused on framing the treaty's mandate, emphasising the importance of CE principles and reducing plastic waste. However, significant challenges arose early on, with countries diverging on key issues like the scope of the treaty and which areas should be prioritised.

By the third round (INC-3), negotiators attempted to streamline the draft text and clarify provisions, though divisions remained. Countries with strong plastic production industries, notably oil-producing nations, resisted proposals to limit production. This resistance highlighted the deep economic divides between developed and developing countries and their varying concerns regarding the impact of production limits on their economies.

INC-4 brought some incremental progress on addressing issues like hazardous plastic waste and the integration of just transition principles. However, key points of contention, including financial mechanisms and specific production limits, remained unresolved. These ongoing disagreements demonstrated the difficulty of aligning economic and political interests with the scientific urgency of tackling plastic pollution.

As the negotiations moved to INC-5, it became clear that three issues would be pivotal in determining the final shape of the treaty: the regulation of plastic production, the management of harmful chemicals in plastics, and the establishment of a financial mechanism to support developing countries. These and other areas of disagreement are still delaying the process, necessitating further deliberation in a future final session.

In this context, the second part of the fifth round of negotiations was initiated (with a third yet to follow), during which new divergences emerged, highlighting the main areas of disagreement:

- *Scope and objectives*: whether the treaty should cover the entire life cycle of plastics or focus exclusively on pollution; differences over the language to be used, for example “address,” “reduce,” or “eliminate”;
- *Principles and definitions*: lack of consensus on the definition of “plastic pollution” and on the inclusion of specific approaches (precautionary principle, extended producer responsibility, etc.);
- *Products and design*: debates on global lists of problematic plastics, criteria for phasing out, mandatory vs voluntary measures, and design standards;
- *Production and waste management*: divisions over addressing global production, extended producer responsibility, and links with the Basel Convention;
- *Persistent pollution*: divergences on strategies for remediating persistent pollution (plastics legacy) and on the most appropriate mechanisms for implementation;
- *Just transition*: disputes over including a dedicated article and its binding nature;
- *Implementation mechanisms*: disagreements on financial mechanisms, technology transfer, and international cooperation;
- *National plans, reporting, and compliance*: whether these should be binding or voluntary, and their connection to financial support;
- *Governance*: disagreements on decision-making rules (consensus vs voting), the role of the Secretariat (UNEP or alternatives), subsidiary bodies, and relations with other treaties; and
- *Cross-cutting issues*: health, information sharing, indigenous knowledge, education, and awareness – all discussed but remaining unresolved.

Although there is shared recognition of the urgency to address (marine) plastic pollution, fundamental divergences persist regarding the treaty’s scope, the binding nature of obligations, and supporting mechanisms.

On the eve of the final phase of negotiations, attention is focused on the level of ambition that the final text can realistically achieve. While a highly ambitious treaty is desirable, the current context suggests that the highest level of ambition may not be fully realised.

The success of the treaty will therefore depend on the Parties' ability to reconcile conflicting interests, ensuring fair and sustainable solutions capable of protecting both people and the planet.

3.2 The Legally Binding Instrument on Plastic Pollution: Possible Dialogues with different Environmental Agendas

Global and multi-sectoral action to mitigate the effects of (marine) plastic pollution is driven primarily by the recognition that the multiple and cascading risks posed by marine litter and plastics make them threat multipliers.

Plastics are known to have the potential to act in concert with other stressors, such as climate change and overexploitation of marine resources, to cause far greater harm than if they were to occur alone. Habitat changes in key coastal ecosystems caused by the direct impacts of marine litter and plastics affect local food production and damage coastal structures, leading to far-reaching and unpredictable consequences, including loss of resilience to extreme events and climate change in coastal communities¹³⁹⁵.

As the global plastic pollution crisis continues to escalate, the urgent need for a cohesive and coordinated response becomes ever more apparent. The growing recognition of the interconnections between plastic pollution, climate change, and biodiversity loss calls for the development of a comprehensive global framework that addresses these challenges in unison.

The plastics treaty, emerging as a critical instrument in this global effort, holds the potential to integrate various environmental agendas – particularly climate change – into a more effective and holistic approach.

This chapter explores the perspectives and pathways for the future of the global plastics treaty, emphasising its role in fostering synergies with existing international frameworks such as the Paris Agreement and the Convention on Biological Diversity.

By examining the treaty's potential to support climate mitigation strategies, promote biodiversity conservation, and facilitate the transition to a circular economy, the chapter aims to outline the essential steps needed to ensure that the treaty functions as an integral part of the global environmental governance system.

Furthermore, the challenges and opportunities inherent in the implementation of the treaty, particularly the need for cross-regional cooperation, capacity-building, and robust monitoring systems, are discussed in detail.

Ultimately, this chapter posits that the successful negotiation and implementation of a legally binding plastics treaty is not only necessary for addressing plastic pollution

¹³⁹⁵ UNEP (2021b). *Ob. cit.*, p. 15.

but also a crucial step toward achieving broader environmental sustainability goals in a rapidly changing world.

3.2.1 Identifying Synergies within the Climate Change Framework

Plastic is not merely waste; it can absorb toxic, persistent organic compounds from seawater. Furthermore, its production is closely tied to the petrochemical industry, which plays a significant role in the emission of GHGs that contribute to climate change.

At the heart of the plastic waste crisis lies a decades-long campaign of deceit and misinformation regarding the recyclability of plastics. Despite being fully aware that recycling (all) plastic is neither technically nor economically feasible, petrochemical companies – both independently and through industry trade associations and front groups – have conducted misleading marketing and public education efforts to deceive the public into believing plastic recycling is a viable solution to the waste problem¹³⁹⁶.

(Marine) plastic pollution, thus, is an urgent problem, among other things, because it interacts with many other environmental crises, such as climate change.

Other than being an environmental issue – with all the ecological, biological and chemical aspects that it encompasses –, the transboundary character of MPP also gives light to the reason why international law needs to be attentive and regulate it, as it was made with climate change through the UNFCCC¹³⁹⁷ framework and, more specifically, through the Paris Agreement.

To better understand the complexity of the relationship between the ocean and the climate – and, further, plastics and the climate –, this session is divided into subsections.

Subsection A “3.2.1.1” discusses the ocean-climate nexus and the growing recognition of the ocean’s role in climate change, particularly regarding its vulnerability and its contribution to climate solutions.

Climate change poses significant threats to marine ecosystems, such as ocean warming, acidification, and deoxygenation, which are exacerbating the impacts on biodiversity, coastal communities, and the economy. Despite these challenges, the ocean

¹³⁹⁶ The plastic waste crisis was created by the world’s leading petrochemical companies. In: Allen, D.; *et al.* (2024). *The Fraud of Plastic Recycling: How Big Oil and the plastics industry deceived the public for decades and caused the plastic waste crisis*. Center for Climate Integrity, p. 5. Available at: <https://climateintegrity.org/uploads/media/Fraud-of-Plastic-Recycling-2024.pdf>. Accessed on 15 August 2024.

¹³⁹⁷ The UNFCCC does not reference the UNCLOS, nor does it explicitly address the relationship between the two conventions. This absence of mutual recognition suggests a lack of integration between the two legal frameworks. The synergies between them have not been emphasized, reflecting a limited focus on the ocean within the climate regime. In: Guilloux, B; Schumm, R. (2016). *Which International Law for Ocean and Climate? Ocean and Climate Scientific Notes*, vol. 2, n. 2, p. 79. Available at: https://www.ocean-climate.org/wp-content/uploads/2017/03/international-law-161024_ScientificNotes_Oct2016_BD_ppp-14.pdf. Accessed on 21 August 2023.

also plays a crucial role as the world's largest carbon sink, absorbing a substantial portion of anthropogenic CO₂ emissions and heat.

The subsection highlights the shift in international climate policy, with recent COPs emphasising ocean-based climate actions and recognising the ocean's importance in achieving climate mitigation and adaptation goals. It stresses the need for integrated strategies across climate and ocean governance, with the International Tribunal for the Law of the Sea (ITLOS) playing a central role in addressing the complex relationship between ocean governance and climate change – as it has been tasked with outlining state obligations under the UNCLOS related to climate change impacts, such as ocean warming, acidification, and rising sea levels.

Subsequently, Subsection B “3.2.1.2” delve into the origins and fate of plastics, which are largely derived from the petrochemical industry, thus releasing GHGs throughout their entire lifecycle – plastics and climate change, hence, are deeply interconnected but have been treated as separate issues in policy discussions.

Plastics contribute to climate change not only through emissions from production but also from their environmental impact and these issues need to be addressed simultaneously to prevent one from exacerbating the other.

Despite the scientific consensus, international policy responses remain insufficient, with global climate agreements not directly addressing the intersection of plastics and climate change. A comprehensive solution involves global cooperation, innovative waste management, and a shift towards more sustainable production and consumption practices.

3.2.1.1 *The International Tribunal for the Law of the Sea Advisory Opinion as a Milestone: Recognising the Ocean-Climate Nexus*

Climate change – or the “climate emergency”¹³⁹⁸ – poses one of the greatest risks to the global economy, natural resources, and public health, and the ocean is particularly vulnerable to its effects. Beyond the direct impact on human societies, climate change also threatens species, ecosystems, and biodiversity, either through direct harm or due to the loss of critical habitats, potentially leading to extinction in some cases¹³⁹⁹.

Since records began in 1955, the temperature of the ocean has increased steadily, setting new records in 2023. Marine heat waves are becoming more frequent and intense because of all this extra heat¹⁴⁰⁰.

Furthermore, ocean acidification is being intensified primarily due to the reaction between seawater and atmospheric CO₂ emissions originated from human activity. The ecological integrity of the ocean is already threatened, and acidification poses a serious compounding threat to it – not to mention the great threat that climate change poses to coral reefs and the various species that depend on them¹⁴⁰¹.

Nevertheless, it has also started to contribute to positive feedback loops related to the climate, which pose a risk to drive further climate change beyond the Paris Agreement’s 1.5-2.0°C temperature targets¹⁴⁰².

Hence, ocean warming, acidification¹⁴⁰³, deoxygenation, and changes in primary productivity are considered the four major climate change stressors of ocean ecosystems

¹³⁹⁸ Here referred as the emergency that is mainly related to the emission of GHG that contribute to rise temperatures, leading to increases in extreme heat events, substantial damages, increasingly irreversible losses, reduced food and water security, hindering efforts to meet the SDGs. In: IPCC (2023). Climate Change 2023: Synthesis Report. A Report of the Intergovernmental Panel on Climate Change. Contribution of Working Groups I, II and III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [Core Writing Team, H. Lee and J. Romero (eds.)]. Summary for Policymakers. IPCC, Geneva, Switzerland, p. 5-6. Available at: https://www.ipcc.ch/report/ar6/syr/downloads/report/IPCC_AR6_SYR_SPM.pdf. Accessed on 18 December 2023.

¹³⁹⁹ Nwabueze, J.N.; Techera, E. (2021). *Ob. cit.*, p. 217.

¹⁴⁰⁰ National Aeronautics and Space Administration (2024). The Ocean and Climate Change. Available at: <https://science.nasa.gov/earth/explore/the-ocean-and-climate-change/>. Accessed on 16 October 2024.

¹⁴⁰¹ Telesetsky, A; Bratspies, R. (2021). *Ob. cit.*, p. 157-158.

¹⁴⁰² Taylor, P. (2023). Ocean Acidification and the Anthropocene: An Emergency Response. In: **The Routledge Handbook of Law and the Anthropocene**. 1st edition, Burdon, P.D.; Martel, J. (eds.). Oxford: Routledge, p. 132. ISBN 9781032482491.

¹⁴⁰³ In this regard, a recently published scientific review reports that seven of the nine planetary boundaries have now been exceeded, for the first time including ocean acidification. Alongside Climate Change, Biosphere Integrity, Land System Change, Freshwater Use, Biogeochemical Flows, and Novel Entities, this new breach highlights worsening trends across Earth’s life-supporting systems. Only Ozone Depletion and Aerosol Loading remain within the safe operating space, underscoring the growing risk of critical tipping points with severe consequences for ecosystems and societies. In: Planetary Boundaries Science (2025). Planetary Health Check 2025 – A Scientific Assessment of the State of the Planet. Potsdam Institute

– and since they occur simultaneously, there is a high chance that they will have synergistic effects¹⁴⁰⁴. Contradictorily, although the ocean ecosystem is in danger, it can also act as the world’s largest carbon sink – which is essential for reducing the effects of climate change itself¹⁴⁰⁵.

Therefore, ocean-climate interactions have gained increasing attention, to the point that the presidency of the 23rd UNFCCC Conference of the Parties (COP 23) formally introduced the “ocean pathway” into the climate solutions agenda. This acknowledges the significance of the ocean in the climate system and the availability of ocean commitments for adaptation and mitigation through NDCs under the UNFCCC¹⁴⁰⁶.

Prior to that, although the 1992 UNFCCC formally recognized the role of marine ecosystems as sinks and reservoirs of greenhouse gases¹⁴⁰⁷, subsequent COP negotiations largely overlooked ocean, marine, and coastal ecosystems. Given the rise in ocean-related side events, increased participation from ocean scientists and NGOs, and the signing of the “Because the Ocean” Declaration by 22 Parties¹⁴⁰⁸, the Paris Agreement marked a significant turning point for the recognition of the ocean within the climate negotiations¹⁴⁰⁹.

Moreover, unlike the 1997 Kyoto Protocol, which made no explicit reference to marine or ocean systems, the Paris Agreement formally acknowledges the ocean in Paragraph 13 of its Preamble

Noting the **importance of ensuring the integrity of all ecosystems, including oceans**, and the protection of biodiversity, recognized by some cultures as Mother Earth, and noting the importance for some of

for Climate Impact Research (PIK), Potsdam, Germany. DOI: 10.48485/pik.2025.017. Available at: <https://www.planetaryhealthcheck.org/wp-content/uploads/PlanetaryHealthCheck2025.pdf>. Accessed on 03 October 2025.

¹⁴⁰⁴ Gallo, N.; *et. al.* (2017). Ocean commitments under the Paris Agreement. **Nature Climate Change**, vol. 7, p. 835. DOI: <https://doi.org/10.1038/nclimate3422>. Available at: <https://www.nature.com/articles/nclimate3422>. Accessed on 18 September 2024.

¹⁴⁰⁵ UN (2021). How is climate change impacting the world’s ocean. United Nations, Climate Action. Available at: <https://www.un.org/en/climatechange/science/climate-issues/ocean-impacts>. Accessed on 19 September 2024.

¹⁴⁰⁶ Abram, N.; *et. al.* (2019). Framing and Context of the Report. In: IPCC Special Report on the Ocean and Cryosphere in a Changing Climate. Cambridge University Press, Cambridge, UK and New York, NY, USA, p. 92. Available at: https://www.ipcc.ch/site/assets/uploads/sites/3/2019/11/SROCC_FOD_Ch01_Final.pdf. Accessed on 20 September 2024.

¹⁴⁰⁷ Article 4 “Commitments” (...) (d) Promote sustainable management, and promote and cooperate in the conservation and enhancement, as appropriate, of sinks and reservoirs of all greenhouse gases not controlled by the Montreal Protocol, including biomass, forests and oceans as well as other terrestrial, coastal and marine ecosystems. In: UN (1992b). *Ob. cit.*, p. 5.

¹⁴⁰⁸ On the eve of COP21 in Paris, ministers and heads of state and government signed the first “Because the Ocean” Declaration.

¹⁴⁰⁹ Gallo, N.; *et. al.* (2017). *Ob. cit.*, p. 835.

the concept of “climate justice”, when taking action to address climate change, (...) ¹⁴¹⁰ (*author’s emphasis*)

In addition, recent COPs have increasingly addressed ocean–climate interactions. For example, the Global Environment Facility’s report to COP 26 emphasised that life on Earth fundamentally depends on clean air and water, biodiversity, a healthy ocean and lands, and a stable climate, while also highlighting how the climate emergency drives rising sea levels, flooding, coastal erosion, more frequent extreme weather events, coral reef bleaching, and ocean acidification¹⁴¹¹.

The Sharm El Sheik decision from COP 27, instead, invited Parties to, when appropriate, take ocean-based actions into account for achieving their national climate goals and carrying them out, including (but not limited to) the NDCs, long-term plans, and communications on adaptation¹⁴¹². Whereas the COP 28’s draft decision CMA.5 encouraged “*further strengthening of ocean-based action*”¹⁴¹³.

The most recent COP (29th edition) featured, for the first time, a pavilion entirely dedicated to ocean issues – hosting numerous events on the ocean–climate nexus – and culminated in the adoption of the “COP29 Baku Ocean Declaration” which urges states, organisations, and companies to prioritise ocean-focused actions aligned with the shared objectives of the climate, biodiversity, and desertification COPs

The ocean is critical for achieving the climate mitigation and adaptation objectives of the 29th Conference of the UNFCCC Parties. It is the planet’s largest carbon sink and currently absorbs nearly one-quarter to one-third of human-caused carbon dioxide emissions and 90% of heat generated by anthropogenic greenhouse gas emissions. For that reason, ocean-based climate solutions can offer significant opportunities to keep the crucial 1.5°C target within reach.

Only by more fully monitoring the ocean will it be possible to predict future warming and assess the needed emissions reductions and any potential removal methods. This will be critical in the design of effective and achievable Nationally Determined Contributions (NDCs). Our ability to meet these goals will determine the magnitude and rate of necessary adaptation to factors such as sea-level rise, increasing atmosphere and ocean temperatures, changes to the hydrological cycle, trends in ocean acidification and deoxygenation, ecosystem and biodiversity declines, and severe weather events. For this reason, the ocean is also key to developing

¹⁴¹⁰ UN (2015c). *Ob. cit.*, p. 2.

¹⁴¹¹ UN (2020). Report of the Global Environment Facility to the Conference of the Parties. Framework Convention on Climate Change, FCCC/CP/2020/1, 23 October 2020, p. 83. Available at: https://unfccc.int/sites/default/files/resource/cp2020_01S.pdf. Accessed on 27 May 2024.

¹⁴¹² COP 27 (2022). Sharm el-Sheikh Implementation Plan. Decision-/CP.27. Available at: https://unfccc.int/sites/default/files/resource/cop27_auv_2_cover%20decision.pdf. Accessed on 13 May 2024.

¹⁴¹³ UNFCCC (2023a). First global stocktake Proposal by the President Draft decision -/CMA.5 Outcome of the first global stocktake. FCCC/PA/CMA/2023/L.17. Available at: https://unfccc.int/sites/default/files/resource/cma2023_L17_adv.pdf. Accessed on 13 May 2024.

effective National Adaptation Plans (NAPs) to protect and support communities, marine life, and infrastructure worldwide.

(...) A healthy blue economy will also help address the loss and damage that some have already experienced and that will occur as a result of unavoidable change. (...)

To achieve these goals, we call upon all countries, relevant organizations, and private-sector actors to make robust, long-term investments in ocean observations, research, and mapping. This is a foundational requirement to synergistically address the objectives set forth by the climate, biodiversity, and desertification COPs. (...)

In particular, the global community should prioritize ocean-based actions that will support progress toward priorities shared by the climate, biodiversity, and desertification COPs, including: (...)

Improve awareness of the ocean's role in planetary systems: Raising public understanding and appreciation of the ocean's importance and the need for its preservation is a vital step towards mobilizing decision-makers to prioritize ocean protection and restoration. Educational programs, outreach initiatives, and media campaigns to raise ocean literacy across diverse populations, inspire the next generation of ocean leaders, and foster collective action to safeguard our ocean planet must become more widespread, accessible, and commonplace. (...) ¹⁴¹⁴. (*author's emphasis*)

The interdependencies between climate regulation and the ocean, thus, underpin the concept of the ocean-climate nexus¹⁴¹⁵.

This nexus does not exist in isolation: climate change is inextricably connected to a wider web of international legal domains. Areas such as the law of the sea, trade, human rights, and intellectual property¹⁴¹⁶ directly shape and influence climate mitigation and adaptation efforts¹⁴¹⁷, making it essential to consider these regimes when designing policies or addressing disputes related to climate change.

This does not mean that climate governance is formed by comprehensive international regulatory institutions – which are typically concentrated on a single integrated legal instrument –, but instead, it presents itself as a regime complex. These regimes are characterised by the absence of an overarching architecture or hierarchy among its institutions and regulations (in fact this is a regime complex's primary political

¹⁴¹⁴ Ocean Pavilion (2024). COP29 Baku Ocean Declaration. Available at: <https://oceanpavilion-cop.org/baku-ocean-declaration/>. Accessed on 22 December 2024.

¹⁴¹⁵ Pörtner, H.O.; *et al.* (2019). The ocean and cryosphere in a changing climate. In: IPCC Special Report on the Ocean and Cryosphere in a Changing Climate, 1155. Available at: https://www.ipcc.ch/site/assets/uploads/sites/3/2019/12/SROCC_FullReport_FINAL.pdf. Accessed on 16 July 2024; and Voigt, C. (2023). Oceans and Climate Change: Implications for UNCLOS and the UN Climate Regime. In: **The Environmental Rule of Law for Oceans: Designing Legal Solutions**. Platjouw, F.M.; Pozdnakova, A. (eds.). Cambridge: Cambridge University Press, p. 17-30. DOI: <https://doi.org/10.1017/9781009253741.006>. Available at: https://www.cambridge.org/core/services/aop-cambridge-core/content/view/CC543E90CAAA4CF7E0314815DB0BC315/9781009253765c2_17-30.pdf/oceans-and-climate-change.pdf. Accessed on 16 May 2024.

¹⁴¹⁶ Nwabueze, J.N.; Techera, E. (2021). *Ob. cit.*, p. 228-229.

¹⁴¹⁷ Jakobsen, I.U.; *et al.* (2021). *Ob. cit.*, p. 375.

characteristic). Rather, there are connections and intersections between the specific and relatively narrow regimes¹⁴¹⁸.

More illustratively, the climate change regime complex includes climate mechanisms within the UN framework, which are the UNFCCC and the Kyoto Protocol, the specialised agencies of the UN (for example, the UNDP and the UNEP), as well as many bilateral and multilateral framework agreements and governance platforms¹⁴¹⁹. Besides, overarching mechanisms interact with and influence climate change rules on specific matters – and consequently, the density of climate governance instruments is progressively expanding¹⁴²⁰.

In the case of the ocean regime, the UNCLOS is the central mechanism (but not the sole¹⁴²¹). An interesting aspect of the UNCLOS is that, while it is in force since 1994, it established a jurisdictional framework that was intended to enable it to adapt to new challenges that were not known at the time it was negotiated, even though it is designed to offer predictability and certainty. Since then, other global issues like climate change have emerged, posing new challenges to the UNCLOS' inherent tension between stability and change¹⁴²².

The absence of a specific mention of climate change within the UNCLOS' text does not imply that it is outside the convention's regulatory purview. Conversely, the goal of the UNCLOS was to encompass all activities that took place in the ocean, including the creation of new needs and technologies. Potential applications of ocean space include the creation of marine renewable energy resources and the application of geoengineering methods to eliminate excess GHGs from the atmosphere. These applications demonstrate how the law of the sea can become essential to accomplishing the objectives of the Paris Agreement¹⁴²³.

Given their common concerns, cooperation between the ocean and the climate change regimes initially seems uncomplicated. Finding a common ground is essential to any cooperation between these regimes – after all, for a regime complex to function

¹⁴¹⁸ Keohane, R.O.; Victor, D.G. (2011). The Regime Complex for Climate Change. **Perspectives on Politics**, vol. 9, n. 1, p. 7-8. DOI: doi:10.1017/S1537592710004068. Available at: <https://www.cambridge.org/core/journals/perspectives-on-politics/article/abs/regime-complex-for-climate-change/F5C4F620A4723D5DA5E0ACDC48D860C0>. Accessed on 13 March 2024.

¹⁴¹⁹ Zhang, L.; Bai, E. (2023). *Ob. cit.*, p. 4.

¹⁴²⁰ *Ibid.*, p. 7.

¹⁴²¹ Through specific treaties, this regime touches on specific challenges such as fisheries, pollution, and regional marine environmental issues.

¹⁴²² Jakobsen, I.U.; *et. al.* (2021). *Ob. cit.*, p. 377.

¹⁴²³ Part XIV of UNCLOS.

efficiently, it is fundamental to create strong connections between the different regimes in order to provide a cohesive regulatory framework¹⁴²⁴.

From this analysis, it is evident that climate change and ocean governances are part of what is called a regime complexity – in other words, international political systems of global governance that emerge due to the coexistence of rule density and regime complexes¹⁴²⁵.

Regime complexes can be viewed as tangible phenomena that can occur anywhere along the realism-complex interdependence spectrum, and they can evolve into a form of institutional transformation where collaborative agreements are modified or displaced by political shifts within the regime complex¹⁴²⁶.

In fact, this regime interplay might improve synergies and be the most effective solution for intricate, multilevel issues – such as climate change which is a complicated transboundary environmental and socioeconomic matter that is difficult to solve with a single tool or framework¹⁴²⁷.

As an outcome of this complexity, fresh collaborative endeavours uncommonly start from scratch. Global governance solutions therefore need to adopt one of two strategies: either international actors accept that policy solutions will be developed, coordinated, and implemented within a larger regime complex, or they can try to create an all-encompassing regime that can address all aspects of the problem – although this last solution is rarely adopted¹⁴²⁸.

A roadmap for a better governance of the ocean could be established by determining the potential challenges of the interaction between the ocean and the climate change regime, as well as by identifying the opportunities for integration¹⁴²⁹.

In this scenario, the ITLOS – at the centre of this complexity – found appropriate to provide an overview of the science and legal regime regarding climate change as a background to the demand of the SIDS for an Advisory Opinion.

¹⁴²⁴ Kim, S.W. (2023). Synergizing Climate Change and Ocean Regimes: A Comprehensive International Legal Approach for Ocean Acidification Governance. *Ocean and Polar Research*, vol. 45, n. 4, p. 192. Available at: <https://e-opr.org/articles/article/7R7d/>. Accessed on 12 June 2024.

¹⁴²⁵ Alter, K.J.; Raustiala, K. (2018). The Rise of International Regime Complexity. *Annual Review of Law and Social Science*, vol. 14, p. 333. Available at: <https://www.annualreviews.org/content/journals/10.1146/annurev-lawsocsci-101317-030830>. Accessed on 12 June 2024.

¹⁴²⁶ *Ibid.*, p. 337.

¹⁴²⁷ Jakobsen, I.U.; *et. al.* (2021). *Ob. cit.*, p. 384.

¹⁴²⁸ Alter, K.J.; Raustiala, K. (2018). *Ob. cit.*, p. 337.

¹⁴²⁹ Kim, S.W. (2023). *Ob. cit.*, p. 186.

Before delving into the content of the Advisory Opinion, it is worth giving context and consider that climate change threatens the resilience of the ocean and poses serious challenges to coastal communities that depend heavily on marine resources¹⁴³⁰.

Specifically for SIDS, climate change constitutes an existential threat. Its ocean-related impacts – manifested through sea-level rise, ocean warming, acidification, and heightened concentrations of greenhouse gases – pose severe risks to food security by undermining fisheries and shellfish aquaculture in various oceanic regions. At the same time, these processes contribute to the intensification of tropical cyclones and extratropical storms, as well as recurrent flooding in coastal and other low-lying areas, thereby exacerbating the structural vulnerabilities of SIDS¹⁴³¹.

For these States, the challenges encompass not only the impacts on fisheries – an essential pillar of livelihoods, economies, and food security for their populations¹⁴³² – but also the risk of forced migration from low-lying coastal zones¹⁴³³ and even the real possibility of vanishing beneath the surface by the end of this century¹⁴³⁴.

As early as 1992, at the United Nations Conference on Environment and Development, the international community formally recognised Small Island Developing States (SIDS) as a “special case” for sustainable development, owing to their distinctive social, economic, and environmental fragilities¹⁴³⁵.

The recognition of SIDS’ vulnerability and ecological fragility was further reinforced in Chapter 17 of Agenda 21, entitled “*Protection of the oceans, all kinds of seas, including enclosed and semi-enclosed seas, and coastal areas and the protection, rational use and development of their living resources*”. The document highlights that their small size, scarce resources, dispersed geographic location, and limited access to markets place them at a competitive economic disadvantage and constrain economies of

¹⁴³⁰ Popova, E.; *et al.* (2019). Ecological connectivity between the areas beyond national jurisdiction and coastal waters: Safeguarding interests of coastal communities in developing countries. **Marine Policy**, vol. 104, p. 90-102. Available at: <https://www.sciencedirect.com/science/article/pii/S0308597X19300764>. Accessed on 09 June 2024.

¹⁴³¹ IPCC (2023). *Ob. cit.*, p. 5-6.

¹⁴³² Shelton, C.; *et al.* (2024). Disaster risk in Caribbean fisheries: How vulnerability is shaped and how it can be reduced in Dominica and Antigua and Barbuda, **Marine Policy**, vol. 160. Available at: <https://www.sciencedirect.com/science/article/pii/S0308597X23004840>. Accessed on 16 June 2024.

¹⁴³³ Vousdoukas, M.I.; *et al.* (2023). Small Island Developing States under threat by rising seas even in a 1.5 °C warming world. **Nature Sustainability**, vol. 6, p. 1552-1564. Available at: <https://www.nature.com/articles/s41893-023-01230-5>. Accessed on 20 June 2024.

¹⁴³⁴ House of Commons International Development Committee (2024). The UK Small Island Developing States Strategy Fourth Report of Session 2023–24. Available at: <https://committees.parliament.uk/publications/46218/documents/231337/default/>. Accessed on 13 June 2024.

¹⁴³⁵ FAO (2014). Natural Resources Management and the Environment in Small Island Development States (SIDS). Policy Paper. Available at: <https://sdgs.un.org/sites/default/files/publications/2241a-i3928e%20%282%29.pdf>. Accessed on 19 June 2024.

scale. Consequently, the ocean and coastal environment assume strategic importance for SIDS, representing not only a vital ecological foundation but also a key economic resource¹⁴³⁶.

Paragraph 130 of this chapter also emphasised the need for greater international cooperation, leading to the convening of the first Global Conference on the Sustainable Development of SIDS. This conference, held in Bridgetown, Barbados, in April 1994, aimed to support SIDS in addressing the complex development and environmental challenges they faced¹⁴³⁷.

During the conference, the Barbados Declaration and Programme of Action for the Sustainable Development of SIDS¹⁴³⁸ was adopted, highlighting the need for enhanced global cooperation, particularly regarding funding, technology transfer, information sharing, and capacity building. Subsequent follow-up conferences have been convened to evaluate the implementation of the Programme of Action, including meetings in Mauritius (2004) and Samoa (2014)¹⁴³⁹.

In 2014, Heads of State, Government representatives, and high-level officials convened at the Third International Conference on SIDS, reaffirming their commitment to the sustainable development of SIDS and adopting the S.A.M.O.A. Pathway¹⁴⁴⁰. The Pathway aimed to address the distinctive challenges faced by SIDS by facilitating the mobilisation of international support and resources for the implementation of the Programme of Action, promoting coordinated follow-up, and providing support for SIDS group consultations, among other measures¹⁴⁴¹.

It is also important to note that the 2030 Agenda explicitly recognises the specific challenges SIDS face in achieving sustainable development. Among the 17 Sustainable Development Goals, Goals 4, 7, 9, 10, 13, 14, and 17¹⁴⁴² particularly address these

¹⁴³⁶ UN (1992a). *Ob. cit.*, n.p.

¹⁴³⁷ UN (1994a). Global Conference on the Sustainable Development of Small Island Developing States, 26 April-6 May 1994, Bridgetown, Barbados. Available at: https://www.un.org/esa/dsd/dsd_aofw_sids/sids_pdfs/BPOA.pdf. Accessed on 26 June 2024.

¹⁴³⁸ UN (1994b). Report of the Global Conference on the Sustainable Development of Small Island Developing States Bridgetown, Barbados, 26 April-6 May 1994. Available at: https://digitallibrary.un.org/record/198168/files/A_CONF.167_9-EN.pdf?ln=en. Accessed on 26 June 2024.

¹⁴³⁹ Mead, L. (2021). Small Islands, Large Oceans: Voices on the Frontlines of Climate Change. Earth Negotiations Bulletin, Brief n. 15, p. 4. Available at: <https://www.iisd.org/system/files/2021-03/still-one-earth-SIDS.pdf>. Accessed on 13 June 2024.

¹⁴⁴⁰ S.A.M.O.A. stands for “SIDS Accelerated Modalities of Action”.

¹⁴⁴¹ UN (2023c). Final report a toolkit for monitoring and reporting on the SAMOA Pathway. Available at: https://www.un.org/ohrrls/sites/www.un.org.ohrrls/files/files/finalreport_sp_160123.pdf. Accessed on 17 June 2024.

¹⁴⁴² UNGA (2015). *Ob. cit.*, n.p.

challenges. Notably, SDG 13 on “Climate Action” refers to SIDS in target 13.b¹⁴⁴³, while SDG 14 on “Life Below Water” includes two targets specifically dedicated to SIDS (14.7¹⁴⁴⁴ and 14.a¹⁴⁴⁵).

Consequently, SIDS have effectively leveraged their shared vulnerabilities to the climate crisis to engage actively in global climate change negotiations. In 1990, they established the Alliance of Small Island States (AOSIS) during the Second World Climate Conference in Geneva¹⁴⁴⁶, and later, prior to COP26 in 2021, an agreement was signed to establish the Commission of Small Island States on Climate Change and International Law (COSIS)¹⁴⁴⁷.

It is noteworthy that the Agreement establishing COSIS explicitly provides in Article 2(2) that “*having regard to the fundamental importance of oceans (...) the Commission shall be authorized to request advisory opinions*¹⁴⁴⁸ *from the International Tribunal for the Law of the Sea (...)*”¹⁴⁴⁹. In line with this mandate, in December 2022,

¹⁴⁴³ Which is the following: “promote mechanisms for raising capacity for effective climate change-related planning and management in least developed countries and small island developing States, including focusing on women, youth and local and marginalized communities; (...)”.

¹⁴⁴⁴ Which is the following: “by 2030, increase the economic benefits to Small Island developing States and least developed countries from the sustainable use of marine resources, including through sustainable management of fisheries, aquaculture and tourism”.

¹⁴⁴⁵ Which is the following: “increase scientific knowledge, develop research capacity and transfer marine technology, taking into account the Intergovernmental Oceanographic Commission Criteria and Guidelines on the Transfer of Marine Technology, in order to improve ocean health and to enhance the contribution of marine biodiversity to the development of developing countries, in particular small island developing States and least developed countries”.

¹⁴⁴⁶ AOSIS (2023). We are Small Island Development States. Available at: <https://www.aosis.org/>. Accessed on 12 June 2024.

¹⁴⁴⁷ COSIS (2022). About COSIS. Available at: <https://www.cosis-ccil.org/about>. Accessed on 12 June 2024.

¹⁴⁴⁸ The COSIS Agreement was established against the backdrop of ITLOS Case 21, 2015. To pursue the ITLOS advisory opinion, West African states established the Sub-regional Fisheries Commission. Many states were in favour, while others were against it. Although there are these disagreements, ITLOS has set precedents by issuing the 2015 advisory opinion.

¹⁴⁴⁹ Commonwealth Foundation (2021). Agreement for the establishment of the Commission of Small Island States on Climate Change and International Law. Entry into force on 31 October 2021. Available at: <https://commonwealthfoundation.com/wp-content/uploads/2021/12/Commission-of-Small-Island-States-on-Climate-Change-and-International-Law.pdf>. Accessed on 13 June 2024.

under Article 21 of the ITLOS Statute and Article 138 of UNCLOS¹⁴⁵⁰, COSIS submitted a request for an Advisory Opinion, constituting Case 31/2022¹⁴⁵¹.

The international legal framework for environmental protection has been notably fragmented, comprising a series of overlapping sub-regimes at both global and regional levels¹⁴⁵². In this regard, the ITLOS – going against a trend of narrowly focused governance frameworks¹⁴⁵³ –, became the first international court to issue an Advisory Opinion concerning the climate emergency¹⁴⁵⁴ – at the request of the COSIS¹⁴⁵⁵.

With regard to the circumstances surrounding COSIS's request for the AO, it should be noted that the Commission incorporated the recommendations of the Committee of Legal Experts (Recommendation CLE.1/2022/Rec) and took into account the work undertaken by the Subcommittee on the Protection and Preservation of the Marine Environment when submitting its request. The Commission sought an ITLOS Advisory Opinion to clarify

what are the specific obligations of States Parties to UNCLOS, including Part XII:

(a) to **prevent, reduce and control pollution of the marine environment in relation to the deleterious effects that result or may result from climate change**, including through ocean warming and sea level rise, and ocean acidification, which are caused by anthropogenic emissions of greenhouse gases into the atmosphere? and

(b) **protect and preserve the marine environment in relation to the impacts of climate change**, including ocean warming and sea level rise, and ocean acidification? (...) ¹⁴⁵⁶ (*author's emphasis*)

¹⁴⁵⁰ Considering Article 2 (2) of the COASIS Agreement, the Commission uttered, “having regard to the fundamental importance of oceans as sinks and reservoirs of greenhouse gases and the direct relevance of the marine environment to the adverse effects of climate change on Small Island States, *the Commission shall be authorized* to request advisory opinions from the International Tribunal for the Law of the Sea (“ITLOS”) on any legal question within the scope of the 1982 United Nations Convention on the Law of the Sea, consistent with Article 21 of the ITLOS Statute and Article 138 of its Rules”, which is present in Paragraph 4 of Case 31/2022. In: ITLOS (2024). **Advisory Opinion**. Request for an Advisory Opinion submitted by the Commission of Small Island States on Climate Change and international law. Available at:

https://www.itlos.org/fileadmin/itlos/documents/cases/31/Advisory_Opinion/C31_Adv_Op_21.05.2024_orig.pdf. Accessed on 19 August 2024.

¹⁴⁵¹ Sabin Center For Climate Change Law (2024). Request for an Advisory Opinion submitted by the Commission of Small Island States on Climate Change and International Law. Available at: <https://climatecasechart.com/non-us-case/18416/>. Accessed on 17 August 2024.

¹⁴⁵² Koivurova, T. (2014). **Introduction to International Environmental Law**. 1st edition. Abingdon/New York: Routledge, 240p. ISBN 978-0-415-81574-1.

¹⁴⁵³ Keohane, R.O.; Victor, D.G. (2011). *Ob. cit.*, p. 7-23.

¹⁴⁵⁴ Here referred as the emergency that is mainly related to the emission of GHG that contribute to rise temperatures, leading to increases in extreme heat events, substantial damages, increasingly irreversible losses, reduced food and water security, hindering efforts to meet Sustainable Development Goals (SDGs). In: IPCC (2023). *Ob. cit.*, p. 5-6.

¹⁴⁵⁵ ITLOS (2024). *Ob. cit.*, n.p.

¹⁴⁵⁶ ITLOS, Case 31/2022, Paragraph 3(1).

In addition, COSIS expressed its support for Vanuatu's initiative, which requested an advisory opinion from the ICJ on climate change¹⁴⁵⁷, and invited the Subcommittees on Sea Level Rise, Human Rights, and Loss and Damage to propose further activities that the Commission could undertake to contribute to the definition, implementation, and progressive development of rules and principles of international law relating to climate change¹⁴⁵⁸.

Throughout 2023, 31 States, seven international organisations, and numerous representatives of civil society submitted written statements to ITLOS outlining their perspectives on COSIS's submission¹⁴⁵⁹, while 33 States, four international organisations, and one regional group indicated their intention to participate in the oral proceedings¹⁴⁶⁰. Additionally, seven civil society representatives sought to act as *amicus curiae*, a request that ITLOS subsequently denied¹⁴⁶¹.

In September 2023, alongside the submissions and requests for oral arguments from various stakeholders, Judge Kittichaisaree sought clarifications regarding the materials presented. The Judge emphasised the need for COSIS and the IUCN to specify, in accordance with Article 76 of the ITLOS Rules, which obligations should be classified as "obligations of conduct" and which as "obligations of result," as well as to provide the rationale underpinning these distinctions¹⁴⁶².

ITLOS grounded its decision on the precedent set by ITLOS Case 21 in 201¹⁴⁶³5, which affirmed the Tribunal's advisory jurisdiction and highlighted the broad support among UNCLOS States Parties for the issuance of an AO concerning fishing activities¹⁴⁶⁴.

The Tribunal further acknowledged the interconnections between the ocean and climate within the scope defined by COSIS, emphasising that anthropogenic activities cause significant warming of the atmosphere, ocean, and land, with consequential adverse effects on marine ecosystems¹⁴⁶⁵.

¹⁴⁵⁷ For a more in-depth analysis of the ICJ opinion, see p. 246 and note 1006 *supra*.

¹⁴⁵⁸ Paragraph 3(3).

¹⁴⁵⁹ Paragraphs 17-23 and 35.

¹⁴⁶⁰ Paragraphs 28 and 36.

¹⁴⁶¹ Paragraph 20.

¹⁴⁶² Paragraph 40.

¹⁴⁶³ ITLOS (2015). **Advisory Opinion of 2 April 2015**. Request for an Advisory Opinion submitted by the Sub-Regional Fisheries Commission (SRFC) (request for Advisory Opinion submitted to the Tribunal) List of cases: No. 21. Available at: https://www.itlos.org/fileadmin/itlos/documents/cases/case_no.21/advisory_opinion_published/2015_21-advop-E.pdf. Accessed on 17 June 2024.

¹⁴⁶⁴ ITLOS, Case 31/2022, Paragraph 90.

¹⁴⁶⁵ Paragraphs 45-82.

ITLOS affirms that climate change exerts direct impacts on the marine environment and emphasises that the general obligation of States Parties under UNCLOS encompasses the protection and preservation of the marine environment, as set out in Article 192. The Tribunal further recognised that this obligation extends to non-State actors operating under the jurisdiction or authority of one or more States Parties¹⁴⁶⁶.

This general obligation entails the prevention, mitigation, and control of marine pollution as integral components of preserving and conserving the marine environment. In this regard, ITLOS articulates about the general rule of Article 192 of UNCLOS

(...) applies to all maritime areas and **can be invoked to combat any form of degradation of the marine environment, including climate change impacts**, such as ocean warming and sea level rise, and ocean acidification. Where the marine environment has been degraded, this may require restoring marine habitats and ecosystems.¹⁴⁶⁷ (*author's emphasis*)

Nonetheless, ITLOS emphasised that pollution control constitutes only one component of the broader obligation¹⁴⁶⁸. In this regard, the Tribunal clarified that the “preservation of the marine environment” includes the “restoration of marine habitats and ecosystems,” despite the term “restoration” not appearing explicitly in Article 192. In effect, the duty to protect the marine environment extends to rehabilitating degraded habitats and ecosystems, thereby contributing to the maintenance of ecological balance¹⁴⁶⁹.

Significantly, ITLOS recognised that States are required to undertake all feasible measures, in accordance with their capacities and available resources, to prevent, reduce, and manage marine pollution resulting from anthropogenic GHG emissions¹⁴⁷⁰.

This obligation is fully compatible with the principle of common but differentiated responsibilities, as reflected, for example, in the Paris Agreement, which establishes differentiated targets for emissions reductions among States.

The Tribunal’s recognition of the ocean–climate nexus underscores the critical importance of climate change and its profound impacts on SIDS¹⁴⁷¹. The Court emphasised the need for harmonisation between UNCLOS and other international instruments (Article 237), particularly to ensure consistency between Part XII of

¹⁴⁶⁶ Paragraph 396.

¹⁴⁶⁷ Paragraph 400.

¹⁴⁶⁸ Paragraphs 151-152.

¹⁴⁶⁹ Paragraph 386.

¹⁴⁷⁰ Paragraphs 241.

¹⁴⁷¹ Paragraphs 121-122.

UNCLOS and relevant external legal frameworks governing the protection and preservation of the marine environment¹⁴⁷².

ITLOS reinforces UNCLOS as a dynamic instrument by advocating for the coordination and harmonisation of UNCLOS with related legal frameworks, including the Paris Agreement, thereby contributing to the progressive development of international law¹⁴⁷³.

In conclusion, ITLOS – positioned at the intersection of the ocean–climate nexus – has established a roadmap for improved ocean governance by identifying both the challenges arising from the interaction between ocean and climate regimes and the opportunities for their integration¹⁴⁷⁴.

The Tribunal thus affirms the legitimacy of recognising these interconnections through its Advisory Opinion, analysing the relevant legal and scientific frameworks to serve as a strategic guide for coherent and effective governance of the ocean¹⁴⁷⁵.

As both regimes evolve in response to emerging global challenges, their interdependence becomes increasingly evident. Effective cooperation between them is not merely desirable but essential to address the complex threats posed by climate change.

Moving forward requires sustained engagement from all stakeholders – governments, scientific institutions, civil society, and international organisations – to develop adaptive strategies that enhance the resilience of marine environments while combating climate change. By reinforcing the synergies between ocean health and climate action, the international community can safeguard vulnerable ecosystems and advance sustainable development objectives, particularly for SIDS, which remain on the front lines of these pressing challenges.

¹⁴⁷² Paragraphs 130-137.

¹⁴⁷³ Paragraph 130.

¹⁴⁷⁴ Kim, S.W. (2023). *Ob. cit.*, p. 186.

¹⁴⁷⁵ *Ibidem*.

3.2.1.2 Addressing the “Carbon Footprint” of Plastics: could they fit the Paris Agreement regime?

Plastics and climate change are intrinsically linked, with plastics production currently contributing with 4.5% of global GHG emissions – exacerbating existing environmental damages¹⁴⁷⁶.

Without policy intervention, demand for plastics could double by 2050 and emissions from plastics – across their entire lifecycle – could triple by 2060. Worryingly, despite current remediation and policy efforts, plastics will continue to be produced and accumulate in the environment for many decades to come¹⁴⁷⁷.

Plastics are the last stage of the vast petrochemical industry, with more than half of this waste ending up in consumer products, mainly in the form of disposable packaging – most often following the take-make-waste premise¹⁴⁷⁸.

Industrial activities are major potential generators of plastic waste, such as the production of plastic bags, single-use disposable plastic items and microbeads. Plastic bags are the number one consumer item on the planet; most plastic packaging is disposable – especially in applications involving direct trade between the producer, seller or service provider and the end consumer – with most of them being discarded in the same year they were produced¹⁴⁷⁹.

If current waste management practices do not improve by 2060, mismanaged plastic waste could increase to nearly 270 metric tons, particularly in countries with less developed waste management systems¹⁴⁸⁰.

Plastic waste generated from consumption and disposal, after physical-chemical processes, decomposes and, in its fragmented form (micro or nanoplastics), have already been found in the air, in bottled and tap water, in foods such as commercial sea salt, table

¹⁴⁷⁶ Stegmann, P.; *et. al.* (2022). Plastic futures and their CO₂ emissions. *Nature*, vol. 612, p. 272-276. Available at: <https://www.nature.com/articles/s41586-022-05422-5>. Accessed on 20 March 2024.

¹⁴⁷⁷ Charlton-Howard, H.S.; *et. al.* (2023). ‘Plasticosis’: Characterising macro- and microplastic-associated fibrosis in seabird tissues. *Journal of Hazardous Materials*, vol. 450. Available at: <https://www.sciencedirect.com/science/article/pii/S0304389423003722?via%3Dihub>. Accessed on 20 March 2024.

¹⁴⁷⁸ Ellen MacArthur Foundation (2019). *Ob. cit.*, n.p.

¹⁴⁷⁹ Microbeads are synthetic plastic particles intentionally added to consumer and industrial products, usually for their abrasive or exfoliating properties, and can vary in chemical composition, size, shape, and density. They can also be used in other consumer products, including household cleaners, printer toners, medical applications, and industrial processes. In: UNEP (2018g). *Legal Limits on Single-Use Plastics and Microplastics: A Global Review of National Laws and Regulations*, p. 6. Available at: <https://www.unep.org/resources/report/legal-limits-single-use-plastics-and-microplastics>. Accessed on 22 April 2024.

¹⁴⁸⁰ OECD (2022a). *Ob. cit.*, p. 25.

salt, in household dust and in almost all aquatic environments, as well as in various freshwater systems and even in human organs¹⁴⁸¹.

Like many other contaminants (such as GHGs and substances that deplete the ozone layer), plastic is not restricted by national borders and can migrate via water and air currents¹⁴⁸².

The plastic crisis, similar to other destructive human activities, begins on land, seeping into soil and water bodies following a series of inefficient and underdeveloped end-of-life management activities¹⁴⁸³.

The plastics problem is, undeniably, multifaceted and deeply intertwined with climate change¹⁴⁸⁴. Plastic pollution and climate change, however, have typically been treated as two separate issues and are sometimes even seen as competing¹⁴⁸⁵.

The lifecycle of plastics involves several negative impacts related to climate change, ranging from the extraction of raw materials, through transportation and production, and finally to waste treatment¹⁴⁸⁶. In this sense, Figure 40 represents the major sources and pathways of human generated plastic waste in the (marine) environment:

¹⁴⁸¹ Microplastics have been detected in human lungs and placentas, which have direct exposure to the external environment through various body cavities. In: Yang, Y.; *et. al.* (2023). Detection of Various Microplastics in Patients Undergoing Cardiac Surgery. **Environmental Science & Technology**, vol. 57, n. 30, p. 10911-10918. Available at: <https://pubs.acs.org/doi/epdf/10.1021/acs.est.2c07179>. Accessed on 02 April 2024.

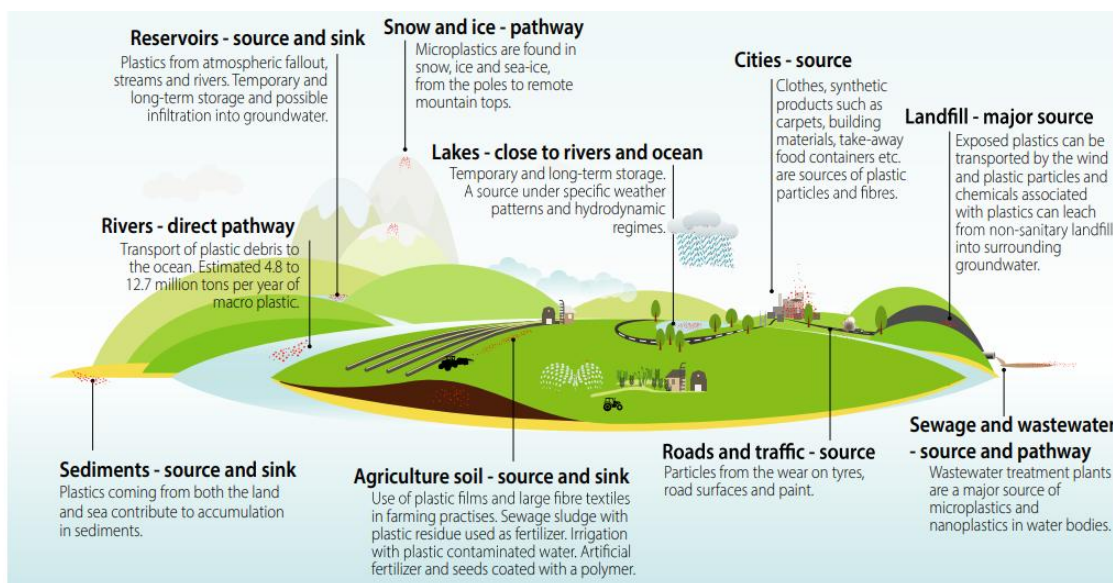
¹⁴⁸² Borrelle, S.B.; *et. al.* (2017). Why we need an international agreement on marine plastic pollution. **Proceedings of the National Academy of Sciences**, vol. 114, n. 38, p. 9994. Available at: <https://www.pnas.org/doi/pdf/10.1073/pnas.1714450114>. Accessed on 12 April 2024.

¹⁴⁸³ Krantzberg, G.; *et. al.* (2023). *Ob. cit.*, p. 46.

¹⁴⁸⁴ *Ibid.*, p. 50.

¹⁴⁸⁵ Ford, H.V.; *et. al.* (2022). The fundamental links between climate change and marine plastic pollution. **Science of The Total Environment**, vol. 806, Part 1. ISSN 0048-9697. Available at: <https://www.sciencedirect.com/science/article/pii/S0048969721054693>. Accessed on 25 March 2024.

¹⁴⁸⁶ Gonçalves, L.C.S. (2019). The Effects of Plastics on Climate Change: An Analysis of the Potential Responses within the Nationally Determined Contributions (NDCs). **Yearbook of International Environmental Law**, vol. 30, n. 1, p. 165-192. Available at: <https://academic.oup.com/yielaw/article-abstract/30/1/165/6362691?redirectedFrom=fulltext>. Accessed on 20 March 2024.

Figure 40 – Pathways, sources, sinks and temporary accumulation¹⁴⁸⁷

Source: UNEP (2021b). **From Pollution to Solution: A global assessment of marine litter and plastic pollution.** Synthesis. Nairobi.

Throughout all these pathways, plastic waste enters the environment, and GHG emissions are generated at every stage of its lifecycle, from production to incineration¹⁴⁸⁸.

For example, in the extraction of raw materials used in the manufacture of plastics, it is known that the oil and gas industries are the main sources of GHG emissions. Plastic production is also a high source of emissions, as is the case with all manufacturing, and its contribution rate depends on the efficiency of each facility. In addition, waste treatment has several undesirable ramifications. Even recycling plastic waste, or generating energy from it, releases a lot of GHGs. Furthermore, plastic waste collection continues to fail in most parts of the world and, even when it works, the inability to deal with the huge amount of plastic waste has led to international trade in plastic waste or incineration, which contribute to exacerbating climate change¹⁴⁸⁹.

¹⁴⁸⁷ UNEP (2021b). *Ob. cit.*, p. 46.

¹⁴⁸⁸ The production, conversion and management of plastic waste generates around 4% of total GHG emissions. Of these, 90% can be attributed to the production and conversion phase of the plastic lifecycle. In: OECD (2023). *Climate change and plastics pollution: Synergies between two crucial environmental challenges. Policy Highlights.* Available at: <https://www.oecd.org/environment/plastics/Policy-Highlights-Climate-change-and-plastics-pollution-Synergies-between-two-crucial-environmental-challenges.pdf>. Accessed on 27 March 2024.

¹⁴⁸⁹ Gonçalves, L.C.S. (2019). *Ob. cit.*, p. 170.

Plastics discarded in the environment (marine and terrestrial) also slowly release GHGs (under natural conditions, such as solar radiation ¹⁴⁹⁰) – at lower levels when compared to plastic incineration, but this is a continuous and prolonged process¹⁴⁹¹.

This released CO₂, when dissolved in the ocean in large quantities, causes a shift in the balance of inorganic carbon species in the ocean and moves the ocean pH towards the acidic side. As a result, the relative amount of available carbonate decreases, causing ocean acidification. Along with plastic pollution, other phenomena such as ocean acidification and warming, eutrophication and chemical pollution are major stressors that operate to negatively affect the health and resilience of the ocean¹⁴⁹², which in turn is essential for adaptation to climate change.

It is worth noting that this “carbon footprint” of different types of plastics may differ depending on their ingredients and how and where they were produced, but regardless of this, it is important to emphasise that the extraction of raw materials and the transformation of this into resin (the main ingredient in plastics) was responsible for 61% of global emissions from the plastics sector in 2015 alone¹⁴⁹³.

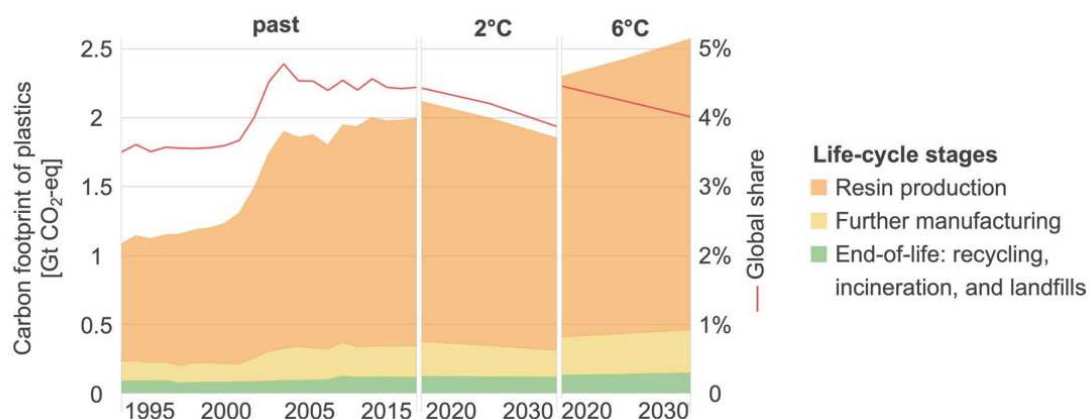
In this regard, Figure 41 illustrates the temporal progression of the global carbon footprint (GHG emissions) of plastics from 1995 to 2015, and projections from 2020 to 2030 under different scenarios (divided by life-cycle stages), while Figure 42 represents the temporal development of the global carbon footprint of plastics recycling, incineration, and landfills separately:

¹⁴⁹⁰ The most commonly used plastics produce two GHGs, methane (one of the most potent atmospheric greenhouse gases) and ethylene, when exposed to ambient solar radiation. In: Royer, S.J.; *et al.* (2018). Production of methane and ethylene from plastic in the environment. **PLoS ONE**, vol. 13, n. 8. Available at: <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0200574>. Accessed on 23 March 2024.

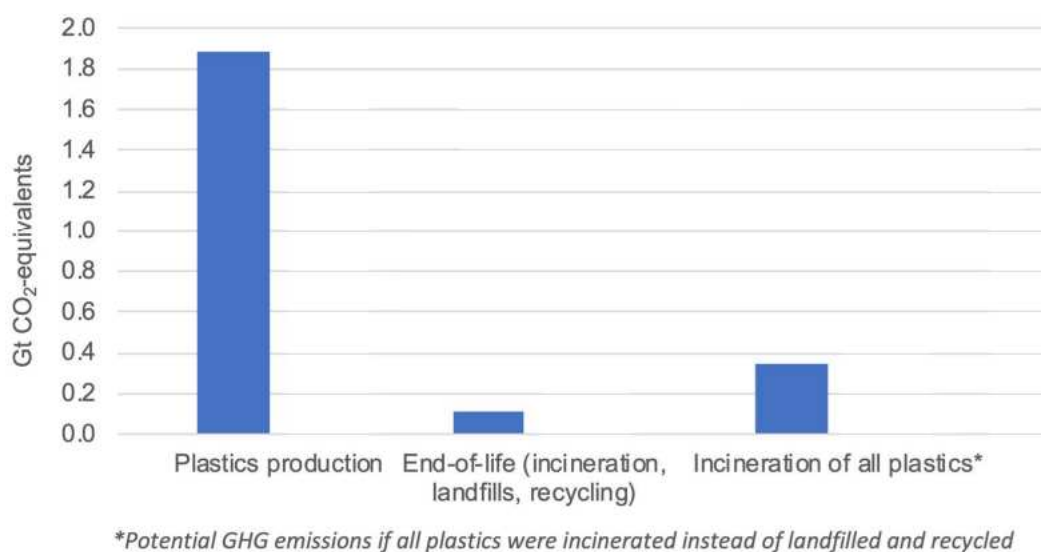
¹⁴⁹¹ Shen, Maocai; *et al.* (2020). (Micro)plastic crisis: Un-ignorable contribution to global greenhouse gas emissions and climate change. **Journal of Cleaner Production**, vol. 254, p. 3. Available at: <https://www.sciencedirect.com/science/article/abs/pii/S0959652620301852>. Accessed on 23 March 2024.

¹⁴⁹² Ford, H.V.; *et al.* (2022). *Ob. cit.*, p. 2.

¹⁴⁹³ Rubio-Domingo, G.; Halev, A. (2022). Making Plastics Emissions Transparent. Coalition on Materials Emissions Transparency (COMET). Available at: <https://ccsi.columbia.edu/sites/default/files/content/COMET-making-plastics-emissions-transparent.pdf>. Accessed on 29 March 2024.

Figure 41 – Temporal Development of the Global Carbon Footprint¹⁴⁹⁴

Source: Cabernard, L.; *et. al.* (2022). Growing environmental footprint of plastics driven by coal combustion. *Nature Sustainability*, vol. 5.

Figure 42 – Global Carbon Footprint of Plastics in 2015¹⁴⁹⁵

Source: Adaptation of Cabernard, L.; *et. al.* (2022). *Ob. cit.*, p. 158.

It is also important to mention that, since the plastics value chain covers the entire globe, these materials are often produced in different locations from where they are consumed and, therefore, the socioeconomic, health and environmental impacts resulting

¹⁴⁹⁴ Cabernard, L.; *et. al.* (2022). Growing environmental footprint of plastics driven by coal combustion. *Nature Sustainability*, vol. 5, p. 149. Available at: <https://www.nature.com/articles/s41893-021-00807-2>. Accessed on 02 April 2024.

¹⁴⁹⁵ *Ibid.*, p. 158.

from plastics produced and consumed in a given country can unfold and affect other parts of the planet¹⁴⁹⁶.

The situation becomes even worse when we realise that much of the contribution of plastic to climate change is not even accounted for, leading to a lack of action and miscalculations in climate target projections¹⁴⁹⁷.

Therefore, the climate and plastic crises, if addressed separately, each remain a competing problem within the policy space. The interconnectedness of the two issues needs to be integrated at the early stages of development to ensure joint solutions where solving one does not exacerbate the other¹⁴⁹⁸.

The estimates are endless, but the results are easy to understand; animals are starving and dying of entanglement, and humans are eating, drinking and even breathing plastic, with health consequences that are largely unknown. Pollution itself is already causing several negative impacts related to climate change: for example, plastics in the ocean interfere with the ability to sequester carbon to such an extent that they could cause a constraint that could take up as much as 13% of the carbon budget by 2050, making it impossible to achieve the historic Paris Agreement goal of keeping global temperatures from rising by 1.5°C or even 2.0°C by 2100¹⁴⁹⁹.

For these reasons, combating global plastic pollution is at the heart of climate change. The complexity of this task is noteworthy and involves a radical change in the production and consumption methods of plastics¹⁵⁰⁰.

Reducing GHG emissions from plastics will require vigorous use of multi-layered techniques¹⁵⁰¹, and the greatest opportunities for overcoming this problem will come from reducing the unnecessary and most problematic uses of plastic, with a transformation of the market towards circularity¹⁵⁰².

¹⁴⁹⁶ *Ibid.*, p. 139-148.

¹⁴⁹⁷ Gonçalves, L.C.S. (2019). *Ob. cit.*, p. 172.

¹⁴⁹⁸ Krantzberg, G.; *et. al.* (2023). *Ob. cit.*, p. 50.

¹⁴⁹⁹ Article 2, 1. This Agreement, in enhancing the implementation of the Convention, including its objective, aims to strengthen the global response to the threat of climate change, in the context of sustainable development and efforts to eradicate poverty, including by: (a) Holding the increase in the global average temperature to well below 2°C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5°C above pre-industrial levels, recognizing that this would significantly reduce the risks and impacts of climate change; (...).

¹⁵⁰⁰ Bachmann, M.; *et. al.* (2023). Towards circular plastics within planetary boundaries. **Nature Sustainability**, vol. 6, p. 599. Available at: <https://www.nature.com/articles/s41893-022-01054-9>. Accessed on 20 March 2024.

¹⁵⁰¹ Zheng, J.; Suh, S. (2019). Strategies to reduce the global carbon footprint of plastics. **Nature Climate Change**, vol. 9, p. 377. Available at: <https://www.nature.com/articles/s41558-019-0459-z>. Accessed on 20 March 2024.

¹⁵⁰² UNEP (2023e). *Ob. cit.*, p. 7.

Despite the scientific knowledge developed about plastic pollution, when the global politics are observed, it is possible to visualise that international agreements on this subject are often at a lower level than the urgency that the problem demands, as if they were – in the present moment – just as were the climate change agreements in 1992, when the UNFCCC formally recognised the problem of climate change.

Plastic pollution policies cannot simply be expected to keep pace with international deliberations on carbon emissions, in terms of drafting international discussions and reaching agreements. The scale and pace of solutions must correspond to the scale and pace of emissions, considering the magnitude of the problem¹⁵⁰³.

The consequences of the release of plastics into the environment, as well as climate change, must be part of the International Ocean and Climate Governance Agendas, since both issues have great potential to cause damage to marine ecosystems and, therefore, need to be discussed. Ocean-related issues should not be sectorised, but integrated, to ensure a healthy ocean and a resilient planet¹⁵⁰⁴, for both this generation and future ones.

Although the international community has recently given attention to the problem of plastics in the ocean, the COP 26, held in 2021 – an important forum for global discussions on the climate emergency and related environmental issues – did not directly address the topic.

The Global Environment Facility report for COP 26, while recognising that life on Earth fundamentally depends on clean air and water, biodiversity, a healthy ocean and land, and a stable climate, recognising that the climate emergency influences in rising sea levels, flooding, coastal erosion, increased extreme weather events, bleaching of coral reefs and ocean acidification¹⁵⁰⁵, made no mention of plastics in the seas and their effects.

Similarly, COP 27 that took place in 2022, resulting in the Sharm el-Sheikh Decision, “welcomes the results and key messages of the ocean and climate change dialogue” and “encourages Parties to consider, as appropriate, ocean-based actions in their national climate goals and their implementation”, but does not yet directly address plastic pollution as an issue that affects both the ocean and the climate¹⁵⁰⁶.

¹⁵⁰³ Borrelle, S.B.; *et. al.* (2017). *Ob. cit.*, p. 9995.

¹⁵⁰⁴ UNFCCC (2021b). Healthy Oceans Vital to Achieving a Low-carbon and Resilient World. UN Climate Change News, 8 June 2021. Available at: <https://unfccc.int/news/healthy-oceans-vital-to-achieving-a-low-carbon-and-resilient-world>. Accessed on 02 April 2024.

¹⁵⁰⁵ UN (2020). *Ob. cit.*, p. 83.

¹⁵⁰⁶ COP 27 (2022). *Ob. cit.*, n.p.

Likewise, the COP 28 decision of 2023 only welcomed “*the results and informal synthesis report on the dialogue on oceans and climate change in 2023 and encourages further strengthening of ocean-based action, as appropriate*”¹⁵⁰⁷. And, finally, the COP 29 provided an interesting outcome – the COP 29 Baku Ocean Declaration¹⁵⁰⁸.

The lack of official statements on the relationship between climate change and plastic pollution, however, goes against a holistic approach to the problem.

The Paris Agreement expressly foresees, in its preamble, the need for an effective and progressive response to the urgent threat of climate change based on the best available scientific knowledge, as well as the fundamental priority of safeguarding food security and ending hunger and particular vulnerabilities of food production systems to the adverse impacts of climate change. It does not provide, however, specific provisions on the issue of ocean acidification, nor MPP – phenomena that cause and/or are related to the loss of biodiversity and food insecurity, as well as how they interact with climate change.

The only mention of the ocean – which is undeniably vital for mitigating and adapting to climate change – appears also in the preamble, simply noting the importance of ensuring the integrity of all ecosystems, including the sea, and the protection of biodiversity¹⁵⁰⁹.

The inherent link between the climate crisis and plastics in society should lead scientists and policymakers to address them in unison and take a holistic approach rather than viewing them as separate issues¹⁵¹⁰.

According to the 2019 special report from the IPCC, soil is critically important in discussions about climate action, both as a source of GHG emissions and as a solution to climate change. About 23% of global human caused GHG emissions come from agriculture, forestry, and other land uses.

Furthermore, 44% of recent human-produced methane (a potent GHG) came from agriculture and other land-based sources. That said, well-managed land-based emissions reduction efforts, such as afforestation, reforestation, or wetland rehabilitation, have great potential in carbon sequestration and other ecosystem co-benefits in the face of climate

¹⁵⁰⁷ COP 28 (2023). Outcome of the first global stocktake. Draft decision -/CMA.5. Proposal by the President. FCCC/PA/CMA/2023/L.17. Available at: <https://unfccc.int/documents/636608>. Accessed on 02 April 2024.

¹⁵⁰⁸ Ocean Pavilion (2024). *Ob. cit.*, n.p.

¹⁵⁰⁹ UN (2015c). *Ob. cit.*, p. 2.

¹⁵¹⁰ Krantzberg, G.; *et. al.* (2023). *Ob. cit.*, p. 33.

change, as long as the continuous flow of plastic waste generation does not exceed GHG reduction measures¹⁵¹¹.

The plastic crisis, like many other destructive human activities, begins on land, infiltrating soil and water bodies following a series of inefficient and underdeveloped end-of-life management activities. Over the past two decades, less than 20% of the annual 8 million tons of plastic in the sea comes from oceanic sources, such as fisheries and fishing vessels; the remaining 80% comes from terrestrial sources; 75% of ocean plastic debris from land-based sources comes from uncollected waste deposited directly in and around rivers and other bodies of water that serve as direct pathways to marine ecosystems¹⁵¹².

The waste collected is recycled (9%), incinerated and/or burned with energy recovery, or deposited in landfill (80% or more). The amount of plastic material in the environment exposed to sunlight exceeds the amount of submerged plastic. In addition to landfills' known contribution to GHG releases (particularly methane emissions), creating landfills to accommodate the growing amount of plastic waste typically means destroying natural habitats for wildlife or the ecosystem that acts as a carbon sink, directly impacting climate change mitigation interventions. The production and release of toxic chemicals from landfilled plastic has also affected the health of fertile soil and the entire landscape¹⁵¹³.

The UNEA's progress towards an internationally binding instrument to end plastic pollution is promising and critical in creating an evolving bottom-up polycentric governance system to facilitate the introduction of a single framework, policy interventions and financial support for better management of conventional plastic in the economy, gradual reduction of plastic production until total eradication and, ultimately, restoration of the natural ecosystem.

The plastics problem is multifaceted and deeply intertwined with climate change.

If addressed separately, each remains a competing problem within the policy space. The interconnection of the two issues needs to be integrated in the early stages of

¹⁵¹¹ IPCC (2019). Climate Change and Land: an IPCC special report on climate change, desertification, land degradation, sustainable land management, food security, and greenhouse gas fluxes in terrestrial ecosystems. Available at: <https://www.ipcc.ch/site/assets/uploads/2019/11/SRCCL-Full-Report-Compiled-191128.pdf>. Accessed on 02 April 2024.

¹⁵¹² Ocean Conservancy; McKinsey Center for Business and Environment (2015). Stemming the Tide: Land based Strategies for a Plastic-free Ocean. Available at: <https://oceanconservancy.org/wp-content/uploads/2017/04/2015-Ocean-Conservancy-ICC-Report.pdf>. Accessed on 16 March 2024.

¹⁵¹³ Krantzberg, G.; *et. al.* (2023). *Ob. cit.*, p. 46-48.

development to ensure joint solutions in which the resolution of one issue does not worsen the other¹⁵¹⁴.

¹⁵¹⁴ *Ibid. Ob. cit.*, p. 50.

3.2.2 Going beyond on the content of Nationally Determined Contributions: Consolidating the Plastics-Climate Nexus?

Some Parties to the Paris Agreement have already demonstrated – to a certain extent – that they recognise the influence of plastics on the climate crisis. Many of them, in fact, address the issue of waste as connected to the climate crisis, directly mentioning plastics (but only as a type or category of waste¹⁵¹⁵), such as Albania, the Bahamas¹⁵¹⁶, Cape Verde, Cambodia, Cameroon, and Colombia.

Others, although they do not directly mention plastic materials, include measures in their NDCs that relate to the issue, such as the promotion of the CE; the promotion of a just transition; the advancement of holistic approaches; the encouragement of restrictions on the production of virgin/raw materials, imposing direct consequences on the oil industry; and the support of such industries in promoting green solutions to reduce methane and other GHG emissions.

In addition to the NDCs, it is relevant to outline that the analysis of the INC-3 proposals indicated support for the inclusion of GHG emissions as plastics-related pollutants in the future LBI for reinforce action to address climate change.

One third of submissions to INC-3 (18 individual country submissions and 3 group submissions) provided contributions related to climate change, representing a total of 125 countries. Furthermore, the preamble and scope of the future LBI have proposed similar elements related to climate change in the proposals.

In the preamble, these include recognition of the interconnected triple planetary crisis (proposed by Norway) and the co-benefits that the instrument's plastics control measures will have for other issues, including climate change (proposed by the African Region, Tunisia, and Uganda). Similar elements have been proposed for the scope of the instrument, including recognition of the contribution of plastic pollution to the triple planetary crisis (proposed by Australia) and the risks and impacts of climate change (proposed by Monaco and the EU).

The proposed scope elements also included considering the positive impacts of the plastics instrument on climate change (proposed by the EU and Chile). One country proposed that GHG emissions over the life cycle of plastics be included in the definition

¹⁵¹⁵ Without necessarily connecting the phases of its lifecycle to impacts on the climate.

¹⁵¹⁶ Interestingly, despite not linking the problem of plastic pollution with CO₂ emissions and the intensification of climate change, the Bahamas has a Plastic Pollution Control Law of 2019, which prohibits single-use plastic utensils for non-biodegradable, oxo-biodegradable and biodegradable foods and single-use plastic bags, in addition to regulating the use of single-use compostable plastic bags, among others.

of negative effects and emissions from plastic pollution, both in the preamble and scope of the instrument (proposed by the Cook Islands). The same country also expressed strong support for decarbonisation throughout the lifecycle of plastics¹⁵¹⁷.

Therefore, all measures adopted to eliminate plastic pollution must be evaluated and monitored for their contribution to the reduction of plastic related GHG emissions, in particular through the determination of baseline emissions before implementing actions and continuous monitoring of trends¹⁵¹⁸.

To support the indicator framework, the future LBI dedicated to fight (marine) plastic pollution could encourage – or demand – Parties to include plastic-related measures in NDCs and other national climate strategies and targets for net-zero emissions¹⁵¹⁹.

The Paris Agreement could play a key role in decarbonising the lifecycle of plastics by offering guidance for the preparation of NDCs and long-term low-emission development strategies (LT-LEDS). Such guidance would be critical in guiding countries towards a transition to net-zero emissions by or around mid-century¹⁵²⁰.

Article 4.4. of the Paris Agreement states that developed countries must lead by setting absolute, economy-wide emissions reduction targets, and developing countries are encouraged to progress towards similar targets, adapted to their national circumstances.

Furthermore, although it does not explicitly mention plastics, Paragraph 36 of the COP 28 Decision on the outcome of the first global stocktake provides vital policy support for collaboration on the circular economy. It notes

the importance of **the transition to sustainable lifestyles and sustainable patterns of consumption and production in efforts to address climate change**, particularly through **circular economy approaches**, and encourages efforts in this direction¹⁵²¹. (*author's emphasis*)

¹⁵¹⁷ Grid-Arendal (2024). Climate impacts of plastics: Global actions to stem climate change and end plastic pollution. Norway. Available at: https://gridarendal-website-live.s3.amazonaws.com/production/documents/s_document/1076/original/ClimateImpactsOfPlastics.pdf?1709631241. Accessed on 10 April 2024.

¹⁵¹⁸ Nonetheless, at present, the integration of measures to reduce plastic pollution with GHG emissions mitigation appears complex, as the treaty negotiations are primarily led by energy ministries and the treaty is perceived as an economic instrument, resulting in limited attention to cross-cutting environmental impact (*cfr. supra*, p. 341-342).

¹⁵¹⁹ Charles, D.; Kimman, L. (2023). Plastic Waste Makers Index 2023. Minderoo Foundation. Available at: <https://cdn.minderoo.org/content/uploads/2023/02/04205527/Plastic-Waste-Makers-Index-2023.pdf>. Accessed on 12 April 2024.

¹⁵²⁰ Grid-Arendal (2024). *Ob. cit.*, p. 47.

¹⁵²¹ *Notes the importance of transitioning to sustainable lifestyles and sustainable patterns of consumption and production in efforts to address climate change, including through circular economy approaches, and encourages efforts in this regard.* In: COP 28 (2023). *Ob. cit.*, p. 2.

Additionally, the Paris Agreement, although does not explicitly mention plastics, it is a crucial agreement to address their climate impact.

Article 4.2 includes a commitment to formulate NDCs in views to accelerate efforts for achieving the 1.5°C climate target. However, as noted, plastics are often not specifically addressed in NDCs. The absence of clear obligations and metrics in NDCs related to plastic objectives may make it difficult to fully integrate the plastic component into these climate contributions.

However, Article 4.14 and Article 13 point to the need to address all relevant sectors that contribute to anthropogenic emissions, which includes sectors related to plastics throughout their life cycle, such as energy, transport, industrial processes and the use of products, and waste¹⁵²².

Furthermore, the LT-LEDS, encouraged by article 4.19 of the Paris Agreement, provide a framework for countries to develop and communicate long-term plans for GHG emissions across all sectors, helping to transition to net-zero emissions by or around mid-century. A key aspect of LT-LEDS should be the inclusion of measures aimed at decarbonising the entire life cycle of plastics. The first synthesis report on LT-LEDS, which reflects strategies from 75 countries representing 87% of global GDP, highlights a gap in explicitly addressing plastics within national mitigation efforts¹⁵²³.

Incorporating the objective of decarbonising the life cycle of plastics in LT-LEDS is increasingly important to align with the broader objectives established at COP 28.

Finally, the Enhanced Transparency Framework under the Paris Agreement is a reporting and review system that builds on (and replaces) the UNFCCC reporting and review system, starting with the submission of the first biennial transparency reports by 31 December 2024¹⁵²⁴.

Article 13.7a of the Paris Agreement obliges countries to report GHG inventories for key sectors using the methodologies of the 2006 IPCC Guidelines for National GHG Inventories detailed in decision 18/CMA.1 and decision 5/CMA.3 on the modalities, procedures and guidelines for the ETF referred to in article 13 and the guidelines for its operationalization.

¹⁵²² Article 4.14: (...) In the context of their nationally determined contributions, when recognizing and implementing mitigation actions with respect to anthropogenic emissions and removals, Parties should take into account, as appropriate, existing methods and guidance under the Convention, in the light of the provisions of paragraph 13 of this Article.

¹⁵²³ UNFCCC (2023b). Long-term low-emission development strategies. Synthesis report by the secretariat (FCCC/PA/CMA/2023/10). Available at: <https://unfccc.int/documents/632339>. Accessed on 12 May 2024.

¹⁵²⁴ UNFCCC (2024). Preparing for the Enhanced Transparency Framework. Available at: <https://unfccc.int/process-and-meetings/transparency-and-reporting/preparing-for-the-ETF>. Accessed on 17 August 2024.

Currently, emissions specifically related to plastics are not separately assessed and monitored. Future collaboration between the future LBI and the Paris Agreement, informed by the IPCC, may be necessary to better understand and address the climate impact of plastics¹⁵²⁵.

In the meanwhile, all NDCs submitted until 19 March 2024 were analysed, in order to evaluate the degree of recognition of the plastic-climate nexus by States¹⁵²⁶. This section is thus divided into two Subsections.

Subsection A “3.2.2.1” evaluates how much the plastic pollution’s impact on climate change is largely unaddressed in the NDCs submitted under the Paris Agreement, with most countries not considering plastics at all. While the Paris Agreement encourages countries to set emissions reduction targets, plastics are rarely incorporated, with only a few nations connecting plastic waste to GHG emissions or considering plastic across its lifecycle. The United Arab Emirates, however, stands out for linking plastic reduction to climate goals. Given that the NDCs alone are insufficient to meet the 1.5°C target, a global plastics treaty is needed to complement the Paris Agreement and reduce plastic-related emissions.

Subsection B “3.2.2.2”, instead, provides a reflection on the success of the global plastics treaty, which will depend on its alignment with other key environmental agendas, such as climate change and biodiversity. Reducing plastic production can help mitigate climate change, so integrating plastic reduction into NDCs under the Paris Agreement is essential.

Additionally, aligning the treaty with Circular Economy principles and the biodiversity agenda will create a holistic approach to tackling plastic pollution. Effective implementation will require cross-regional cooperation, capacity-building for developing

¹⁵²⁵ Grid-Arendal (2024). *Ob. cit.*, p. 20.

¹⁵²⁶ Within the confines of the research timeline, only the NDCs available in the UNFCCC NDC Registry up to 19 March 2024 were considered. Future versions of this study will incorporate the most recent NDCs. It should be noted, however, that after the cut-off date considered in this study, only 33 countries have submitted new NDCs (by August/2025): Panama (13 June 2024), United Arab Emirates (6 November 2024), Brazil (13 November 2024), United States of America (19 December 2024), Botswana (24 December 2024), Uruguay (30 December 2024), Switzerland (2 submissions: one on 14 November 2024 and the other, “Second NDC 2031-2035,” on 29 January 2025), United Kingdom (30 January 2025), New Zealand (31 January 2025), Andorra (5 February 2025), Lesotho (5 February 2025), Ecuador (6 February 2025), Saint Lucia (6 February 2025), Singapore (10 February 2025), Marshall Islands (10 February 2025), Zimbabwe (10 February 2025), Canada (12 February 2025), Japan (18 February 2025), Montenegro (21 February 2025), Cuba (27 February 2025), Maldives (27 February 2025), Zambia (10 March 2025), Kenya (30 April 2025), Moldova (6 May 2025), Nepal (19 May 2025), Belize (14 June 2025), Somalia (19 June 2025), Norway (26 June 2025), Monaco (16 July 2025), Niue (17 July 2025), Cambodia (8 August 2025), Solomon Islands (13 August 2025), and Barbados (30 August 2025).

countries, and robust monitoring systems, all aimed at ensuring cohesive, global action against plastic pollution.

3.2.2.1 *An analysis of global Nationally Determined Contributions and how Plastics could be addressed: Expectations for the Next Round of Submissions*

As the situation worsens further when we recognise that a significant portion of plastic's contribution to climate change is unaccounted for, resulting in inaction and inaccurate climate target projections¹⁵²⁷, it becomes crucial to consider how these gaps can be addressed.

The UNFCCC represents a near-universal commitment to the primary goal of stabilizing GHG concentrations to avoid “dangerous” human interference with the climate system and came into force in 1994¹⁵²⁸.

At that time, there was less scientific evidence than there is today, so GHG emissions from plastics were certainly not yet widely known. In 2015, at the UNFCCC Conference of the Parties (COP), a historic agreement was reached to combat climate change and accelerate and intensify the actions and investments needed for a sustainable, low-carbon future, known as the Paris Agreement.

Both the UNFCCC and the Paris Agreement, however, do not directly address the issue of plastic pollution¹⁵²⁹. They mention pollution circumstances or the role of the ocean as a GHG sink¹⁵³⁰, but all the challenges surrounding plastic pollution – mentioned above – are only indirectly addressed through provisions on promoting the sustainable management of GHG sinks and reservoirs including the ocean¹⁵³¹ and sustainable consumption and production patterns¹⁵³².

Due to the structure of the Paris Agreement, it is therefore up to each Party to dedicate the efforts it deems appropriate to reduce national emissions and adapt to the impacts of climate change, which is detailed in each State's NDC.

Article 4.4 of the Paris Agreement states that developed countries should lead by setting absolute economy-wide emissions reduction targets, and developing countries are encouraged to progress towards similar targets, adapted to their national circumstances¹⁵³³.

Furthermore, although it does not explicitly mention plastics, paragraph 36 of the COP28 decision on the outcome of the first global stocktake provides vital political

¹⁵²⁷ Gonçalves, L.C.S. (2019). *Ob. cit.*, p. 172.

¹⁵²⁸ UN (1992b). *Ob. cit.*, p. 9.

¹⁵²⁹ UN (2015c). *Ob. cit.*, n.p.

¹⁵³⁰ UN (1992b). *Ob. cit.*, p. 2.

¹⁵³¹ As provided for in article 4 “d” of the UNFCCC.

¹⁵³² As provided for in paragraph 16 of the preamble to the Paris Agreement.

¹⁵³³ UN (2015c). *Ob. cit.*, p. 4.

support for collaboration on the circular economy. It notes “the importance of the transition to sustainable lifestyles and sustainable consumption and production patterns in efforts to address climate change, including through circular economy approaches, and encourages efforts in this regard”¹⁵³⁴.

Moreover, the Paris Agreement, while not explicitly mentioning plastics, is a crucial agreement to address their climate impact. Article 4.2 includes a commitment to formulate NDCs to accelerate efforts to achieve the 1.5°C climate target. However, as noted, plastics are often not specifically addressed in NDCs. The lack of clear obligations and metrics in NDCs related to plastics-related targets may make it difficult to fully integrate the plastics component into these climate contributions¹⁵³⁵.

However, Article 4.14 and Article 13 point to the need to address all relevant sectors contributing to anthropogenic emissions, which includes sectors related to plastics throughout their entire life cycle, such as energy, transport, industrial processes and product use, and waste¹⁵³⁶.

In view of this, a *quali-quantitative* analysis was conducted to evaluate the NDCs submitted until 19 March 2024, covering a total of 195 submissions registered in the UNFCCC repository.

This analysis involves both quantitative metrics – such as the frequency and distribution of specific plastic-related commitments – and qualitative assessments of the content and context of the NDCs.

The objective was to identify to what extent the NDCs, within the scope of the Paris Agreement, reflect the interconnections between plastic pollution and climate change. The focus was primarily aimed at identifying direct references to plastics – whether if considered only as a “type of waste”, or when directly related to GHG emissions. Table 7 provides a summary of the results obtained in this regard¹⁵³⁷:

¹⁵³⁴ In the original “Notes the importance of transitioning to sustainable lifestyles and sustainable patterns of consumption and production in efforts to address climate change, including through circular economy approaches, and encourages efforts in this regard”.

¹⁵³⁵ Grid-Arendal (2024). *Ob. cit.*, p. 46.

¹⁵³⁶ In the original, Article 4.14 “In the context of their nationally determined contributions, when recognizing and implementing mitigation actions with respect to anthropogenic emissions and removals, Parties should take into account, as appropriate, existing methods and guidance under the Convention, in the light of the provisions of paragraph 13 of this Article”.

¹⁵³⁷ Annex A of this study contains a table detailing the broad analysis of each of the NDCs of the countries listed above.

Table 7 – Summary of the Provisions on Plastics in the NDCs

No.	Plastics as a Type of Waste	Plastics Directly Related to GHG Emissions
1	Albania	Cambodia
2	Bahamas	United Arab Emirates
3	Cape Verde	Monaco
4	Cameroon	-
5	Qatar	-
6	Colombia	-
7	South Korea	-
8	Dominica	-
9	Egypt	-
10	Fiji	-
11	Haiti	-
12	Indonesia	-
13	Iraq	-
14	Jamaica	-
15	Macedonia	-
16	Maldives	-
17	Mali	-
18	Mauritania	-
19	Nauru	-
20	Nigeria	-
21	Papua New Guinea	-
22	Pakistan	-
23	Republic of the Congo	-
24	Rwanda	-
25	Sao Tome and Principe	-
26	Seychelles	-
27	Sri Lanka	-
28	South Sudan	-
29	Tajikistan	-
30	Tonga	-
31	Turkey	-
32	Uganda	-
33	Vanuatu	-
34	Vietnam	-
35	Zimbabwe	-

In summary, it was observed that the vast majority of States do not even consider plastics in their NDCs – which is the case of the countries of the EU –, that is, approximately 80% of the Parties to the Paris Agreement.

Of the 38 countries that have measures and targets related to plastics, the majority (approximately 17% of the total) categorise them only as a “type of waste” or pollutant, not addressing their entire life cycle.

Only 3 countries (approximately 3% of the total) consider plastics in more than one stage of their life cycle (not just disposal), even addressing their contribution to GHG emissions.

Other Parties to the Paris Agreement demonstrate a more subtle recognition of the influence of plastics on the climate crisis. Many address the issue of waste as connected to the climate crisis (whether they directly mention plastics as a waste category or not)

and others – although they do not directly mention plastic materials – include measures (in force or to be implemented) that relate to the issue. Table 8 summarises such measures:

Table 8 – Summary of measures

Plastic-related Measures	Countries
The promotion of Circular Economy/“3Rs” principles ¹⁵³⁸ .	Andorra, Bangladesh, Cape Verde, Cambodia, Cameroon, Chile, China, Colombia, Costa Rica, Dominican Republic, El Salvador, Georgia, Honduras, Indonesia, Japan, Jordan, Laos, Lebanon, Liberia, Macedonia, Mauritius, Mexico, Moldova, Myanmar, Nepal, Nicaragua, Nigeria, Oman, Pakistan, Panama, Paraguay, Rwanda, Sao Tome and Principe, Saudi Arabia, Serbia, Seychelles, Sierra Leone, South Sudan, Sri Lanka, Tanzania, Thailand, Turkey, Uganda, United Kingdom, Uruguay, Vanuatu, Vatican City, and Vietnam.
The promotion of a just transition.	Antigua and Barbuda, Argentina, Belize, Cape Verde, Colombia, South Korea, Costa Rica, Ivory Coast, Dominica, Dominican Republic, Guatemala, Haiti, Lebanon, Liberia, Macedonia, Mali, Mauritania, Mauritius, Mexico, Montenegro, Nigeria, Norway, Pakistan, Philippines, Suriname, Turkey, United Kingdom, Ukraine, Uruguay, Vietnam, European Union Countries (and the EU).
The promotion of holistic approaches.	Australia, Bolivia, Burkina Faso, Dominica, Dominican Republic, El Salvador, Eritrea, Fiji, Gambia, Grenada, Honduras, Mauritius, Oman, Pakistan, Palestine, Saint Lucia, South Sudan, Tunisia, and Turkey.
The support to restrictions on the production of virgin/raw materials (imposing direct consequences on the oil industry).	Cambodia, China, Indonesia, Palestine, Tajikistan, and Turkey ¹⁵³⁹ .

It is worth noting that the United Arab Emirates’ NDC stands out as the most comprehensive in this regard. The UAE not only presents its goals for implementing a CE that includes plastic materials – stating, for example, that disposable plastic bags are already banned in certain locations, in addition to introducing a fee for their use – but also directly links the ban on disposable plastics with the reduction of GHG emissions from the production of those plastics that use petrochemical derivatives as raw materials.

The country clarifies in its NDC that such a ban also has the potential to reduce GHG emissions from the disposal of plastic waste¹⁵⁴⁰.

Therefore, although there are already NDCs that consider the synergies between plastics and climate change, it can be said that the number is quite insignificant – not only

¹⁵³⁸ Or “reduce, reuse, recycle” (there may be variations). For more, see p. 304-305.

¹⁵³⁹ By not including any specific measures to reduce the use of oil as a raw material for the production of plastics, the NDCs fail to mitigate climate change from two perspectives: first, by not effectively addressing the exploration and use of oil and, second, by encouraging the increase in the production of plastics, which contributes to GHG emissions at all stages of their lifecycle, as already demonstrated in this study.

¹⁵⁴⁰ United Arab Emirates (2023). Accelerating action towards a green, inclusive and resilient Economy. Third Update of Second Nationally Determined Contribution for the UAE. Available at: https://unfccc.int/sites/default/files/NDC/2023-07/Third%20Update%20of%20Second%20NDC%20for%20the%20UAE_v15.pdf. Accessed on 19 March 2024.

in view of the total number of States Parties, but also in view of the magnitude of the triple planetary crisis¹⁵⁴¹.

Even if fully implemented, the NDCs are insufficient to limit global warming to 1.5°C. Therefore, the global plastics treaty must work alongside the Paris Agreement to ensure a rapid and effective reduction in plastic-related emissions.

There is a trend – encouraged by the UN – to recognise the value of synergies, cooperation or enhanced collaboration in the implementation of MEAs, so that national environmental policies and actions are implemented more effectively, providing global environmental benefits and contributing to the achievement of the objectives of the 2030 Agenda and the SDGs¹⁵⁴².

¹⁵⁴¹ As the production of most plastic products is projected to rise exponentially, putting immense pressure on planetary boundaries and contributing to a triple crisis of climate change, biodiversity loss, and pollution. The climate impact of plastics will continue to grow in the coming decades, with industry analysts predicting that production will at least double by 2050. In: Karali, N.; *et al.* (2024). Climate Impact of Primary Plastic Production. Available at: https://eta-publications.lbl.gov/sites/default/files/2024-09/climate_and_plastic_report_lbnl-2001585.pdf. Accessed on 16 May 2024.

¹⁵⁴² The UNEA Resolution 6/4 “Promoting synergies, cooperation or collaboration for national implementation of multilateral environmental agreements and other relevant environmental instruments”, in fact, reinforces these aspects, as it emphasises the need for increased collaboration and the sharing of best practices to maximise co-benefits. In: UNEA (2024). 6/4. Promoting synergies, cooperation or collaboration for national implementation of multilateral environmental agreements and other relevant environmental instruments (UNEP/EA.6/Res.4). Available at: <https://wedocs.unep.org/bitstream/handle/20.500.11822/45383/K2404172-E-UNEP-EA.6-Res.4.pdf?sequence=1&isAllowed=y>. Accessed on 29 April 2024.

3.2.2.2 Perspectives for the Future: Integrating Environmental Agendas for Stronger, More Effective Solutions

As the world confronts the escalating crisis of (marine) plastic pollution, the future of the Global Plastics Treaty will depend on its ability to integrate with and reinforce other critical environmental agendas.

The treaty presents a unique opportunity not only to reduce plastic pollution but also to contribute to broader advancements in environmental sustainability. Given its close interconnection with other urgent global environmental issues, such as climate change and the promotion of CE models, the treaty must be situated as part of a cohesive global environmental framework that operates along with other established regimes.

A key avenue for fostering synergies is aligning the plastics treaty with the global climate agenda. The production of plastics is heavily reliant on fossil fuel consumption, with plastic primarily derived from petrochemicals extracted from oil and natural gas.

Consequently, efforts to reduce plastic pollution inherently intersect with climate change mitigation strategies. One promising opportunity lies in integrating the plastics treaty into the NDCs of the Paris Agreement, where countries pledge to reduce GHG emissions and achieve climate-related goals.

By addressing the reduction of virgin plastic production, the treaty could complement the emissions reduction targets outlined in the Paris Agreement. Countries could incorporate actions aimed at curbing plastic production within their NDCs, thus linking climate change mitigation directly to plastic pollution control.

For instance, reducing plastic production could be framed as a critical step toward reducing carbon emissions, given the significant carbon footprint associated with both plastic production and waste management. This integration would not only enhance the implementation of the Paris Agreement but also offer the dual benefit of mitigating both plastic pollution and climate change concurrently.

Moreover, incorporating plastic reduction targets into NDCs could inspire countries to pursue more ambitious climate and plastic-related objectives while establishing a shared framework for accountability.

Furthermore, the plastics treaty should seek to foster synergies with the global biodiversity agenda. The CBD and its framework for protecting marine ecosystems are closely linked to the issue of plastic pollution – which has devastating effects on marine life and biodiversity.

The Global Plastics Treaty could contribute to biodiversity conservation by ensuring that its provisions support efforts to reduce plastic waste in the ocean and in terrestrial ecosystems. This alignment would prevent the treaty from functioning in isolation and instead ensure that it plays a role in achieving a broader vision of sustainable development that prioritises ecosystem protection and human well-being.

Beyond these specific environmental frameworks, the plastics treaty should be positioned as part of a broader system of governance that includes initiatives such as the European Union's Circular Economy Action Plan and other regional policies. The treaty could serve to facilitate the transition to a CE by promoting initiatives such as design for recycling, EPR, and the development of sustainable alternatives to plastics.

By harmonising with these efforts, the plastics treaty would contribute to the growing movement toward sustainable materials management and resource conservation. This integration with CE principles would further strengthen the treaty's implementation by ensuring a comprehensive approach to reducing plastic pollution at every stage of the lifecycle – from production to disposal.

Finally, a critical factor for the success of the treaty will be cross-regional cooperation and coordination. The treaty must account for the diverse socio-economic and environmental contexts of different countries, ensuring that the global action plan respects regional and national priorities.

This can be achieved through flexible, context-specific strategies that allow countries to adopt tailored approaches while remaining aligned with the overarching objectives of the treaty. Collaboration among various stakeholders, including governments, businesses, and civil society, will be crucial for addressing challenges related to treaty implementation and ensuring that the solutions are equitable and inclusive.

In conclusion, the future of the Global Plastics Treaty should not be viewed as an isolated endeavour but as a vital component of the global environmental governance framework. Its success hinges on its ability to connect with and enhance the efforts of other environmental regimes, such as the Paris Agreement and the CBD, while contributing to broader objectives like the transition to a CE.

By embedding the treaty within this larger environmental structure, it can catalyse stronger, more assertive action on plastic pollution, ensuring that solutions are comprehensive, sustainable, and capable of addressing the interconnected challenges that the planet is facing.

The new treaty should acknowledge that the legal obligations emerging from a binding international instrument will necessitate capacity building, as well as technical and financial assistance, for their effective implementation by developing countries and countries with economies in transition.

Therefore, it is crucial to provide the requisite support to these countries, ensuring their effective participation in the negotiation process. Moving forward, the subsequent steps in the negotiations – leading to the final draft, ratification, and entry into force – must be analysed through an interdisciplinary lens, with the involvement of all relevant stakeholders. This will be a central focus of future research.

The new plastics treaty must be designed to complement existing frameworks, including those with broad mandates like the CBD, which, due to limited resources, can only address specific threats in a general manner. Consequently, it is crucial that the new treaty does not undermine these established regimes. In practice, this entails creating explicit linkages and references to other relevant frameworks within the plastics treaty to ensure cohesive and coordinated action.

Critically, the new treaty must establish a robust system for monitoring progress on targets, assessing the effectiveness of strategies and national action plans to ensure compliance with both binding and voluntary commitments. This will require the development of common global standards for measurement and data collection.

Supported by a technical body, this system would necessitate states to report their national progress transparently. Additionally, the creation of an implementation support structure would facilitate cooperation among state parties, promoting the exchange of technical knowledge and best practices through formalized networks. The inclusion of a global fund could provide financial support to states for implementing their national action plans, particularly for those lacking the national infrastructure and resources to do so. It could also address the absence of a global compensatory mechanism for damages resulting from plastic litter and microplastics.

Although it is likely that a new plastic treaty would initially overlap with existing instruments, the creation of such a framework presents an opportunity to reduce the fragmentation of existing legal structures, fostering synergies across legal regimes and improving the coordination of international efforts to reduce plastic pollution.

The success of any proposed treaty will depend on the availability of alternatives to plastics, as well as the political climate at both the international and local levels. Further challenges include the inherent difficulty in garnering sufficient support among states to agree on and implement the treaty.

Despite UNEP's progress in raising global awareness of the impact of (marine) plastic pollution and possible responses, the fragmented political will among the international community may further delay action on an issue that is rapidly approaching irreversible levels.

Therefore, it is essential to continue building upon existing legal infrastructure while advancing the treaty agenda. Even if all the elements outlined above are incorporated into a new multi-layered governance and regulatory framework, a treaty alone will not resolve the numerous challenges presented by the plastic crisis.

Nevertheless, a dedicated, legally binding international instrument is a critical first step in addressing the ongoing global (marine) plastic pollution emergency.

Synthesis of the chapter

The chapter addresses the critical and intertwined challenges of (marine) plastic pollution and climate change, emphasising the urgent need for an integrated approach to solving these crises.

It highlights the complex relationship between plastics, GHG emissions, and environmental degradation. While the Paris Agreement sets ambitious targets for mitigating climate change, it largely overlooks plastic pollution, which has a significant impact on global ecosystems, biodiversity, and food security.

Plastic production, largely derived from petrochemicals, contributes significantly to climate change, not only through the emissions from production but also due to the improper management of plastic waste. The chapter notes that a large portion of plastic in the ocean originates from land-based sources, exacerbating both environmental degradation and greenhouse gas emissions.

Current international frameworks, including the UNFCCC and the Paris Agreement, do not adequately address the links between plastic pollution and climate change. Although plastics are mentioned indirectly in some NDCs, the majority of countries do not explicitly address them in the context of GHG emissions, despite the critical role plastics play in global warming.

The chapter, hence, points out several gaps in the current global response to plastic pollution. It critiques the lack of integration between plastic management and climate action within existing frameworks. Despite global awareness and significant progress, such as the UNEA's moves toward a binding instrument on plastic pollution, there is limited coordination between the climate and plastic pollution agendas. Furthermore, there is insufficient accounting for the emissions from plastic production and waste management in current climate action plans.

A detailed analysis of NDCs reveals that very few countries have recognised the connections between plastic pollution and climate change. Of the countries that mention plastics in their NDCs, most treat them merely as a waste issue rather than addressing the full lifecycle of plastics, including their role in emissions and climate change.

Looking ahead, the chapter stresses the importance of integrating the plastics treaty with other global environmental frameworks. A unified approach, linking the plastic pollution agenda to the Paris Agreement and broader sustainability goals, is critical for driving global action.

By framing plastic reduction as a climate action strategy, countries could incorporate plastics management into their NDCs, effectively reducing both plastic pollution and GHG emissions.

Further synergies could be built with the global biodiversity agenda, especially considering the devastating impact of plastic on marine life and ecosystems. Aligning the plastics treaty with the CBD could help achieve broader goals of ecosystem protection and sustainable development.

The success of a global plastics treaty will also depend on addressing the diverse socio-economic and environmental contexts of different countries. Flexibility in treaty implementation, combined with robust cross-regional cooperation, will ensure that the treaty accommodates national priorities while adhering to global environmental objectives.

The treaty must as well be supported by strong monitoring mechanisms, with clear global standards for measuring progress on plastic reduction and climate-related goals. The creation of an implementation support structure, including a global fund for developing countries, would help ensure that all nations can participate in and benefit from the treaty's provisions. This would promote the exchange of best practices, the development of alternative materials, and the establishment of a compensatory mechanism for the environmental damage caused by plastic pollution.

The chapter concludes that addressing the plastic pollution crisis requires more than just a standalone treaty: it must be part of a broader, interconnected system of global governance that aligns with climate change, biodiversity, and circular economy goals.

While an international LBI is critical to accelerating action on (marine) plastic pollution, the treaty should not undermine existing environmental regimes but instead enhance their effectiveness through strategic coordination and synergy. With comprehensive, cohesive, and context-sensitive strategies, the global plastics treaty can catalyse decisive, sustainable, and long-term action to tackle both plastic pollution and climate change.

4 FINAL CONSIDERATIONS

This doctoral thesis aimed to analyse the complex, increasingly urgent global crisis of plastic pollution – particularly marine plastic pollution – by assessing its profound environmental, economic, and legal implications.

From its devastating impact on marine ecosystems and biodiversity to the significant economic burdens it imposes on governments and industries, plastic pollution represents a transboundary challenge that cannot be addressed by isolated national efforts.

The analysis conducted in this study highlights the inadequacy of current governance systems, which remain fragmented and insufficient to address the full scope of the problem. As a result, the urgent need for a paradigm shift has emerged – one that moves away from the traditional linear model of plastic production, consumption, and disposal, toward a circular model embracing a holistic, life-cycle approach to plastic materials.

This research, thus, seeks to answer two main central questions:

- i) *What are the gaps that the new treaty must overcome?*
- ii) *Once finalised and adopted, how will it operate in the broader context of international environmental law?*

In order to address the first question, Part I of this thesis is entirely dedicated to the analysis of existing legal instruments – both binding and non-binding – that are relevant to the topic under investigation. This analysis allowed for the identification of a number of legal and regulatory gaps that the proposed new legal instrument should reasonably be expected to fill.

The methodology employed is grounded in a theoretical approach based on a systematic examination of the sources of international environmental law. The investigation relies on a critical and comprehensive review of both primary and secondary sources, selected for their authority and relevance. These include documents produced by international organisations and well-established legal instruments. To support the analysis and provide a suitable contextual framework, the study also examines key international legal instruments in this domain, including conventions, protocols, and declarations pertaining to (marine) plastic pollution and, more broadly, to international environmental law.

The phenomenon of plastic pollution can no longer be ignored or treated as an isolated issue. The solutions adopted thus far – both at the global and national levels – have proven inadequate to address the scale and complexity of the problem.

Despite the introduction of national laws and international regulations aimed at governing plastic waste management, the results achieved to date have been insufficient. Waste management systems continue to exhibit significant shortcomings, due both to inadequate infrastructure and to the fragmentation of national policies, which often fail to cooperate effectively.

In this regard, one of the most pressing issues that emerged from the analysis of existing regulatory frameworks is the fragmentation of international environmental law and the absence of a centralised and coherent legal regime to address plastic pollution.

While numerous treaties and conventions exist to regulate specific aspects of marine environmental protection – such as the United Nations Convention on the Law of the Sea (UNCLOS) and the Basel Convention – these instruments are often fragmented and fail to cover the full spectrum of issues associated with plastic pollution. Difficulties in coordinating action among States, especially due to the lack of binding global commitments, are evident, and the international legal system remains ill-equipped to respond efficiently and promptly to the growing spread of plastic in the ocean.

Nevertheless, some international instruments, such as the Stockholm Convention on Persistent Organic Pollutants and the MARPOL Convention, have attempted to address specific aspects of the issue. However, plastic has never been addressed in a comprehensive manner as a global and systemic threat.

As a result, international regulation of plastics remains incomplete and disorganised, making it difficult to confront the crisis in a coordinated and effective way. Although international law holds considerable potential, it has thus far failed to deliver a global and integrated approach capable of halting (marine) plastic pollution.

In addition to international instruments, national and regional approaches to addressing (marine) plastic pollution are equally important, as evidenced by the diversity of legislation adopted across countries. Many States – particularly within the European Union – have introduced specific laws banning or restricting single-use plastics and promoting recycling and waste reduction policies. These efforts, however, often fall short without international cooperation, as plastic waste knows no borders and can easily cross seas and national frontiers.

Regional initiatives, such as the Honolulu Strategy and the G20 Marine Litter Action Plan, represent positive steps forward; still, their scope remains limited and

heavily reliant on the political will of individual States. Divergences in national policies, combined with a lack of incentives for the adoption of circular economic models, hinder the development of a truly global solution to the problem. It is evident that tackling plastic pollution requires international coordination that transcends local and regional policy frameworks.

The reality on the ground demonstrates that plastic continues to be produced in massive quantities, and its dispersion into the environment is growing at an exponential rate, leading to the persistent accumulation of this material in the ocean, rivers, terrestrial ecosystems, and the food chain.

One of the core issues lies in the fact that plastic is not designed to be easily disposed of. Plastic materials are durable and highly resistant to “biodegradation”. Although existing recycling systems are capable of processing a portion of plastic waste, the vast majority still ends up in landfills or, worse, in the ocean.

The consequences of plastic pollution are devastating, particularly for marine ecosystems. Plastic not only harms marine fauna, but its fragmentation releases toxic substances that contaminate food chains, posing serious risks to biodiversity and human health. Plastic degrades into increasingly smaller particles – micro and nano plastics – which are now ubiquitous, from the depths of the ocean to drinking water.

Marine animals often ingest plastic, mistaking it for food, which leads to severe malformations, malnutrition, and death. In some cases, these particles are absorbed into the food chain, with unpredictable and potentially serious consequences for human well-being. Plastic pollution is, therefore, not merely an environmental issue; it also constitutes a public health and social threat, disproportionately affecting the most vulnerable communities.

The *production-consumption-disposal* cycle has significantly contributed to the formation of massive “plastic islands”, such as the Great Pacific Garbage Patch, highlighting the urgent need for a radical shift in how plastic is produced and consumed.

From an economic perspective, plastic pollution imposes substantial costs on governments and industries. The damage inflicted on marine and coastal ecosystems, as well as its impact on fisheries and tourism, represents only the “tip of the iceberg”. States face considerable expenses related to beach clean-up, waste management, and water treatment. Meanwhile, industries linked to plastic – particularly the food and fashion sectors – are increasingly exposed to reputational risks and mounting consumer pressure to adopt more sustainable practices.

The challenges associated with plastic pollution are not solely ecological but also profoundly social. Coastal communities are among the hardest hit, suffering both from environmental degradation and the economic consequences of biodiversity loss and the contamination of natural resources. At the same time, it is crucial to emphasise that plastic pollution disproportionately affects developing countries, which often lack the financial and technical capacity to manage waste or implement sustainable alternatives.

Another key issue emerging from this thesis is the imperative to ensure that proposed solutions to plastic pollution are fair and equitable – taking into account that the burden of the crisis is not borne equally by all nations.

Emerging economies and developing countries are the most affected by the adverse impacts of plastic pollution, yet they are also the least equipped to address them. In many of these countries, plastic waste management systems are inadequate, resulting in a large portion of plastic ending up in landfills or the ocean. Moreover, due to its low cost, plastic is widely used in everyday consumer goods.

The global response to the plastic crisis must therefore be grounded in principles of justice and equity, ensuring that the most vulnerable countries receive adequate support in terms of resources, technology, and financial assistance to build local capacity and implement effective solutions.

The international community's commitment to supporting developing countries must transcend mere declarations of principle and be translated into concrete policy measures. These should include the financing of waste management projects, the pursuit of alternative solutions to plastic, and the implementation of more efficient recycling systems. International cooperation in this domain is essential to ensure that global policies do not further disadvantage the most vulnerable economies but instead foster a path towards sustainable development that does not compromise the environment.

In addition, it is imperative to consider the responsibility of corporations operating within the plastics sector. Multinational companies – particularly those in the beverage and plastics industries – occupy a central position in the debate surrounding plastic pollution. As this thesis has illustrated, the plastics industry plays a pivotal role in perpetuating the production and consumption cycle of single-use plastics.

Despite attempts to promote recycling practices, plastic continues to be produced and consumed at unsustainable levels. Major players such as *Coca-Cola*, *PepsiCo*, and *ExxonMobil* have been the subject of legal action – as part of the so-called “plastic litigation” – which has exposed their role in disseminating a misleading narrative concerning the recyclability of plastic.

Such legal proceedings are vital instruments for holding corporations accountable for their conduct and for raising public awareness of their responsibilities. However, as highlighted in the analysis, litigation alone is insufficient to address the issue comprehensively. What is required is a global legislative framework that enforces stricter limitations on plastic production and compels companies to transition towards circular economy models in which materials are managed efficiently.

Promoting the circular economy thus emerges as one of the most promising solutions to mitigate the environmental impact of plastic. Both national and international policies should incentivise the design of products that are easily recyclable, reusable, or compostable, thereby reducing the demand for virgin plastic.

The transition from a linear economic model to a circular one represents a viable and durable solution to the plastic pollution crisis. The circular economy offers an alternative vision to the traditional linear model in which plastic is produced, consumed, and subsequently discarded. Instead, it seeks to retain products and materials in use for as long as possible, minimising waste through reuse, recycling, and repair. While the concept of the circular economy is well recognised within environmental policy discourse, its implementation at the global level remains in its early stages.

Policies that encourage the adoption of circular practices and the reduction of single-use plastics are essential to curbing plastic production and promoting the use of more sustainable alternative materials. However, in order to implement a circular model on a global scale, it is necessary to establish a comprehensive system of incentives and regulatory measures that fosters technological innovation, supports research, and facilitates the development of advanced recycling technologies and the design of easily recyclable materials. Achieving this will require cooperation at a global scale – extending beyond national borders to encompass both industry and consumers.

Within this context, the integration of circular economy principles into plastic waste management becomes a crucial element in reducing pollution. Plastic, while inherently recyclable, continues to present significant challenges due to limitations in current recycling technologies – particularly in relation to mixed or hard-to-recycle plastics. A fundamental step towards achieving a circular economy lies in the design of plastics that are more readily recyclable or composed of alternative materials. Plastic production *must* be re-envisioned, with an emphasis on developing innovative solutions that minimise environmental impact.

Moreover, the transition to a circular economy involves more than merely improving recycling systems; it also necessitates a substantial reduction in plastic

production and the strengthening of policies concerning separate waste collection. Governments must actively encourage industries to develop new biodegradable materials or materials derived from renewable natural resources, rather than relying on fossil-based feedstocks. Such an approach has the potential to significantly reduce plastic-related pollution while simultaneously contributing to climate change mitigation.

While governmental policies are critical, consumers also play a fundamental role. Raising public awareness of the importance of recycling and the responsible use of plastic is essential for fostering a culture rooted in circular economy values. Companies should be encouraged to make conscious choices in the design and life cycle of their products, while informed consumers – supported by targeted awareness campaigns – can substantially contribute to decreasing the demand for single-use plastics.

Furthermore, the shift towards a circular economy must not be confined solely to plastics; it ought to form part of a broader vision of sustainability that includes waste reduction, energy efficiency, and the sustainable use of natural resources.

Achieving a global circular economy will require a significant commitment from both governments and the private sector. Public authorities must implement fiscal policies and incentives conducive to the creation of markets for sustainable materials, while industries must commit to transforming their production models to lessen environmental harm.

Circular economy strategies must be supported by investments in recycling infrastructure and complemented by tax measures that incentivise waste reduction and the use of more durable, sustainable materials. Only through such comprehensive action will it be possible to significantly curtail the flow of plastics into the ocean and reduce dependence on single-use plastics.

In light of the issues examined in Part I of this thesis, it is evident that the forthcoming Global Plastics Treaty must address a number of critical gaps in order to be effective and adequately respond to this global crisis.

Among the principal gaps identified are:

- *The absence of legally binding norms on production and consumption:* at present, many international initiatives are primarily focused on waste management and recycling, yet they fail to adequately address the reduction of plastic production, which constitutes the root cause of the problem. The treaty should impose binding obligations on States concerning the reduction of plastic production, particularly with regard to single-use plastics;

- *The disparity between developed and developing countries:* another critical gap relates to the need for a mechanism to address global inequalities. Developing countries, despite being among the most vulnerable to the impacts of plastic pollution, often lack the financial resources and infrastructure necessary to manage it effectively. The treaty must include measures to support these nations, for instance through technology transfer, financial assistance, and capacity-building initiatives;
- *Integration with other environmental agenda:* the treaty should address plastic pollution within the broader context of interconnected environmental challenges, such as climate change and biodiversity loss. One of the current gaps is the lack of integration between plastic-related policies and global commitments to reduce greenhouse gas emissions, even though the issues are closely interlinked. Plastic production, for example, significantly contributes to CO₂ emissions; therefore, the treaty ought to incorporate these interrelated aspects in a synergistic manner;
- *Effectiveness in plastic waste management:* existing waste management policies are not sufficiently harmonised at the international level and often fail to account for the varying waste-handling capacities of different countries. Another gap lies in the inefficiency of recycling systems, given that many types of plastic remain difficult to recycle. The treaty should promote the adoption of innovative solutions and more effective technologies for plastic recycling and waste management; and
- *The absence of a monitoring and enforcement mechanism:* another deficiency concerns the absence of a robust monitoring mechanism to ensure that countries comply with their commitments. Furthermore, effective enforcement tools are needed to address cases in which States fail to meet their obligations. The treaty should therefore establish a strong governance structure with a transparent, verifiable, and measurable monitoring system, capable of ensuring uniform implementation of the rules across different jurisdictions. Consequently, it could contribute to harmonising national policies and ensuring that environmental standards are effectively upheld on a transboundary scale, overcoming the inconsistencies that currently hinder the effectiveness of international action.

With regard to the second research question, the issue is explored through the arguments developed in Part II of the thesis.

The methodology adopted did not confine itself solely to the analysis of sources specific to international environmental law but also integrated contributions from related disciplines in order to offer a broader and more nuanced understanding of aspects that transcend a strictly legal dimension. In particular, the thesis employed a plurality of theoretical and methodological perspectives, drawing upon literature and data emerging from the fields of political science, international relations, and economics.

This interdisciplinary approach was needed due to the recognition that the development of a new international agreement is not an exclusively legal process, but one that is deeply influenced by political dynamics, economic interests, and social considerations – all of which significantly affect the willingness of States to cooperate effectively.

One of the principal methodological challenges encountered was linked to the fact that the core subject of investigation remains under development. At the time of writing, the prospective legally binding instrument is still in the negotiation phase. Nevertheless, the availability of an increasing body of academic studies and policy analyses has enabled the elaboration of a well-grounded and up-to-date assessment, capable of reflecting the current state of international discourse on the matter.

The mandate conferred by the United Nations Environment Assembly, enshrined in Resolution 5/14 “End plastic pollution: towards an international legally binding instrument”, marked a pivotal moment in the international recognition of (marine) plastic pollution as a global crisis. The decision to initiate negotiations for the creation of a binding instrument represents a fundamental step forward in the international response to this pressing environmental challenge.

The proposed treaty aims to address existing gaps in international law by establishing a comprehensive regulatory framework governing the production, use, recycling, and disposal of plastic. The negotiation process has encountered significant challenges, notably conflicts of interest among various stakeholders, particularly between developed and developing nations, each with distinct needs and resources.

Detailed analyses of the sessions held by the Intergovernmental Negotiating Committee (INC), as discussed in this thesis, have illuminated the political and technical complexities involved in crafting a treaty that is both acceptable to all Member States and effectively responsive to the severity of the issue.

The negotiations are unfolding in multiple phases, engaging numerous countries and international actors. In this context, ocean diplomacy plays a pivotal role in facilitating dialogue among Parties, fostering an environment where conflicts between economic interests and environmental protection challenges can be addressed. A critical aspect emerging from the negotiations is the necessity for a compromise between global ambition and the economic realities of various countries.

For instance, the European Union has consistently advocated for ambitious measures to reduce plastic usage, aiming for legislation that extends beyond mere waste management to include strategies for reducing plastic production and consumption. Conversely, other nations, such as the United States and oil-producing countries, have often resisted overly restrictive measures, fearing potential economic repercussions. Specifically, oil-producing countries, which are also major plastic producers, have sought to minimise binding commitments concerning plastic production.

Consequently, (ocean) diplomacy has necessitated a delicate balance between economic imperatives and the imperative for policies that effectively combat (marine) plastic pollution. The challenges encountered during the negotiations reflect the difficulty in achieving global consensus on an urgent issue that involves diverse interests and priorities.

The anticipated outcome (hopefully) should be a compromise that balances the ambitions of reducing plastic pollution with the need to ensure a just and inclusive transition for all countries.

For this to be realised, international cooperation among Member States is essential. However, its success also hinges on the willingness of each country to implement courageous measures and to fulfil commitments made during international negotiations. This is particularly challenging when conflicting economic interests are at stake. For example, countries heavily reliant on the plastic industry for job creation or consumer goods production may be reluctant to curtail plastic production, despite evident environmental needs.

The treaty cannot merely consist of a set of voluntary guidelines; it must establish legally binding commitments that compel nations to undertake concrete actions and monitor outcomes. Moreover, it is essential to incorporate mechanisms for financing and technological support for developing countries, which are among the most vulnerable to the effects of plastic pollution.

In other words, the effectiveness of the legally binding instrument (LBI) will depend on its capacity to address the diverse political, economic, and social challenges

arising in international negotiations. The treaty should be structured not only to include measures for reducing plastic production but also to establish clear obligations for waste management, recycling, microplastic reduction, and pollution prevention. Ideally, the negotiation process should be capable of constructing a system that can adapt to new challenges over time.

Beyond economic and social aspects, the adoption of a new global binding treaty on plastics raises several legal issues. Firstly, it is necessary to consider how to integrate the treaty with other existing international instruments, such as the Paris Agreement on climate change, the Convention on Biological Diversity, and the Stockholm Convention.

Plastic pollution is not an isolated problem; it is closely interconnected with other global environmental issues, including climate change and biodiversity loss. Therefore, a treaty on plastics must be able to address not only the immediate needs of waste management but also broader issues of sustainability and carbon emission reduction.

Plastic production, reliant on fossil fuels, significantly contributes to greenhouse gas emissions, exacerbating the climate crisis. Not only is plastic itself derived from petroleum, but the production process, transportation, and management of plastic waste also generate CO₂ emissions. Thus, plastic is both a cause and a consequence of climate change.

Plastic pollution is a major cause of global environmental degradation; it is responsible for the spread of microplastics in the ocean, thereby reducing the capacity of marine ecosystems to absorb carbon. Therefore, it is crucial to consider plastic pollution as an integral part of the fight against climate change.

Despite growing scientific evidence, the link between plastic and climate change has historically been overlooked in international policies. Major global agreements, such as the Paris Agreement, do not adequately address plastic pollution as a closely related and urgent threat.

Integrating plastic management into climate strategies would, however, allow for the simultaneous addressing of greenhouse gas emissions and the degradation of marine ecosystems. Such synergy between climate action and combating plastic pollution could serve as a catalyst for structural change in national action plans, promoting the adoption of more inclusive policies tailored to specific contexts, as highlighted in this thesis.

It is therefore evident that an effective strategy to combat plastic pollution cannot be separated from the fight against climate change. The integration of various treaties and climate policies will be crucial to ensure a transition towards a more circular economy that reduces plastic production and promotes sustainable waste management.

The interaction between the future Global Plastics Treaty and the Paris Agreement is essential, as a holistic approach could lead to more robust and inclusive solutions. The treatment of plastics, indeed, cannot be addressed as an isolated issue but must be viewed as part of a broader structural change in international sustainability policies.

One solution could be to create a treaty that aligns the reduction of plastic pollution with commitments to reduce greenhouse gas emissions. A future global treaty could thus include binding commitments not only to reduce greenhouse gas emissions but also to reduce plastic production, improve waste management, and promote the transition towards a circular economy.

Furthermore, Nationally Determined Contributions (NDCs), key instruments of the Paris Agreement, are also important in addressing this challenge. NDCs leave considerable discretion to States; however, despite the plastic-climate nexus, plastic is often absent from climate plans. An analysis of NDCs submitted until March 2024 shows that about 80% of Parties do not mention plastic at all – only a few countries consider it in the context of its entire life cycle and its impact on greenhouse gas emissions.

Some Parties, nevertheless, are beginning to integrate related measures, such as circular economy, just transition, or restrictions on virgin plastics. The United Arab Emirates, for instance, presents one of the most advanced NDCs, linking the ban on single-use plastics to the reduction of climate-altering emissions.

Indeed, reducing plastic production will not only help limit plastic pollution but also reduce greenhouse gas emissions, forming part of a global climate change mitigation strategy. Similarly, plastic pollution in waters and seas contributes to the alteration of marine ecosystems, which are fundamental in sequestering atmospheric carbon and balancing global climate.

The solution to these problems requires an integrated global response that simultaneously addresses the ecological crises of plastic and climate change, creating synergies between treaties and international initiatives. Only with a holistic approach will it be possible to limit damage and ensure a more sustainable future.

Moreover, the connection with biodiversity is equally critical. Plastic pollution causes severe harm to ecosystems, particularly marine environments, where marine animals frequently ingest or become entangled in plastic debris. The loss of biodiversity has devastating repercussions not only for ecosystems but also for economies – especially for communities whose livelihoods depend on marine resources. A global agreement that encompasses both biodiversity protection and plastic pollution reduction could generate significant synergies to improve the health of ecosystems and human populations alike.

Another key issue concerns environmental justice and accountability for plastic pollution. As highlighted in the chapter on legal responsibility, it remains unclear how nations can be held accountable for pollution resulting from plastic that has been produced and inadequately managed. The treaty should therefore clearly delineate the responsibilities of both States and industries and establish mechanisms for dispute resolution that ensure effective legal enforcement.

An additional aspect that the treaty will need to address is the coordination between national and international policies in order to prevent the risk of “environmental dumping” – the transfer of plastic waste from countries with stricter regulations to those with more lenient legislative frameworks. This challenge necessitates enhanced cooperation between States, industry stakeholders, and non-governmental organisations to implement shared and sustainable solutions.

In conclusion, only a multilateral, inclusive, and legally binding approach can meaningfully advance the global fight against plastic pollution. The global agreement on plastic management must constitute a fundamental step towards more sustainable resource governance and the protection of both human health and ecological integrity. If effectively implemented, such a treaty could represent a historic turning point in environmental protection, laying the groundwork for a more sustainable and less plastic-dependent world.

Based on the analysis presented in Part II of this thesis, it is concluded that, once finalised and adopted, the global treaty on plastic pollution should *ideally* operate synergistically within the broader framework of international environmental law, contributing to the strengthening of existing legal instruments and paving the way for new approaches to sustainable resource management.

In particular, the treaty has the potential to integrate with and influence the following areas:

- *Contribution to the implementation of the Paris Agreement:* the treaty on plastic pollution, by addressing the reduction of plastic production (upstream), will indirectly support global climate change commitments, particularly in relation to the reduction of greenhouse gas emissions. Plastic production is intrinsically linked to the petrochemical industry, one of the major contributors to global emissions. Therefore, decreasing plastic production is expected to have a positive impact on the fight against climate change, thereby supporting the objectives of limiting global warming as outlined in the Paris Agreement;

- *Support for biodiversity and marine ecosystems:* plastic pollution has devastating consequences for marine ecosystems and global biodiversity. An effective treaty could strengthen biodiversity protection, as reducing plastic pollution would contribute to ocean health and help safeguard marine species threatened with extinction due to plastic debris. This objective aligns with existing international legal frameworks and commitments aimed at protecting marine ecosystems and preventing biodiversity loss;
- *International cooperation and environmental governance:* the forthcoming treaty must be embedded within a broader global governance framework, operating in concert with other international agreements, such as the Basel Convention, which regulates the transboundary movement of hazardous wastes, and the Paris Agreement. The treaty should be compatible with, and reinforce, these legal instruments, thereby contributing to the development of a more integrated and cooperative environmental governance system;
- *Integration with the circular economy:* the treaty has the potential to promote the transition towards a global circular economy by supporting policies that encourage recycling, reuse, and plastic reduction. This aligns with current international efforts to foster more sustainable development models, such as those already supported by European initiatives and by several Member States. In doing so, the treaty would complement broader waste management and economic sustainability policies;
- *Strengthening cooperation between Developed and Developing Countries:* one of the treaty's most significant features, if properly implemented, will be its ability to promote equity between developed and developing nations. Developed countries will be required to provide technical and financial assistance to developing nations, enabling them to improve plastic waste management and reduce pollution. In this way, the treaty would also contribute to the advancement of global environmental justice policies; and
- *New opportunities for legislation and enforcement:* should the plastic pollution treaty be adopted with legally binding provisions, it could stimulate the enactment of national laws and policies that align with international obligations. This, in turn, may generate new opportunities for enforcement and ensure that States comply

with established regulations, including the introduction of sanctions or incentives aimed at improving environmental practices.

In summary, the global treaty on plastic pollution – if properly designed and adopted – has the potential to significantly strengthen existing policies by creating a legal framework that links plastic management to broader environmental crises such as climate change and biodiversity loss. *The expected outcome of these negotiations is a treaty which, although unlikely to be perfect, will lay the groundwork for a comprehensive global approach to addressing plastic pollution and its far-reaching consequences.*

This study has sought to outline the complexity of the issue by highlighting the critical weaknesses of the current system and proposing solutions that range from enhanced international cooperation to legal and technical innovations.

More broadly, this thesis has explored the essential components of a global treaty to tackle plastic pollution, emphasising the need for broad participation, strong obligations, and clear enforcement mechanisms. To achieve this objective, it is vital to create incentives that encourage States to engage without compromising the ambition or rigour of the treaty's provisions.

The findings contribute to significantly broadening the scientific debate on international environmental law, introducing an innovative perspective that does not consider plastic pollution as an isolated issue, but situates it within broader environmental and climate governance. The thesis demonstrates how the future Global Plastics Treaty to be truly effective, must operate in synergy with other international instruments – from the Paris Agreement to the Convention on Biological Diversity, to the Basel Convention – promoting an integrated and coordinated vision of global challenges.

Conceptually, the research highlights the cross-cutting link between plastic pollution, climate change, biodiversity protection, and socioeconomic equity, proposing an approach that intertwines the principles of the circular economy with those of environmental justice and climate change mitigation. This interdisciplinary framework represents an original contribution to the scientific field, overcoming the fragmentation of different legal regimes and opening up new theoretical perspectives.

At the applied level, the findings offer potentially relevant implications for negotiation processes and public policy development. The analysis of the divergences that emerged in the negotiations and the comparative examination of the NDCs submitted by states highlight the limitations of national and regional responses and the need for more ambitious international coordination. From this perspective, the findings can

provide a useful basis for policymakers, negotiators, and international organisations in developing integrated strategies against plastic pollution.

Finally, the thesis offers a platform for further developments, both legally and interdisciplinarily, for example through the qualitative and quantitative analysis of the plastic-climate nexus in national climate commitments or the assessment of the socioeconomic impact of the transition to a less plastic-dependent economy. In this sense, the thesis does not merely offer a theoretical contribution, but opens a research path destined to evolve alongside the development of international negotiations on the topic.

The final version of the plastics treaty, while neither the sole nor the definitive solution to the problem, nevertheless represents a fundamental step forward in the global effort to protect our ocean, ecosystems, and future generations from the growing threat of plastic pollution. Ultimately, combating this phenomenon is not just about managing an urgent environmental crisis; it also involves ensuring justice for vulnerable communities, safeguarding biodiversity, and promoting a world where the health of the planet and its inhabitants is a priority. Overall, emerging governance on (marine) plastic pollution should address all aspects of the ocean emergency in an integrated manner.

Only through collective action and sustained commitment can the international community reverse the trend of plastic pollution, ensuring a cleaner, safer, and more sustainable future for all. Looking ahead, it will be essential to monitor the evolution of the treaty – from the negotiation phase to its implementation – to assess its effectiveness and impact at the global, regional, and national levels.

This thesis aims to provide a foundation for future research, emphasising the importance of multilevel cooperation and continuous adaptation. Addressing (marine) plastic pollution requires a global commitment supported by strong governance, equitable solutions, and effective monitoring systems. The future Global Plastics Treaty, although representing only a first step, must be part of a broader and more dynamic effort towards building a sustainable and circular economy, capable of protecting the planet and the health of present and future generations.

REFERENCES

A) Theses and manuals

Cassese, A. (2021). **Diritto Internazionale**. Quarta Edizione. Bologna: il Mulino, p. 259. ISBN: 978-88-15-29366-4.

Cipolloni, D.; *et. al.* (2023). **Mal di plastica: verità e bugie sul materiale che ha sommerso il mondo ed è entrato nel nostro sangue**. Bari: Edizioni Dedalo, p. 71. ISBN 978-88-220-4904-9.

Cowan, E. (2025). **Orchestrating a Global Plastics Agreement: Understanding the Actors in the Negotiating Arena with an Arctic Case Study on the Road to End Plastic Pollution**. Norwegian University of Science and Technology, thesis for the Degree of Doctor Philosophiae Faculty of Social and Educational Sciences. Doctoral theses at NTNU, 2025:40, p. 44. ISSN 2703-8084. Available at: <https://ntnuopen.ntnu.no/ntnu-xmlui/handle/11250/3177832?show=full>. Accessed on 20 February 2025.

Crawford, J. (2002). The International Law Commission's Articles on State Responsibility – Introduction, Text and Commentaries. Edinburgh: Cambridge University Press, p. 81. Available at: <https://assets.cambridge.org/97805218/13532/sample/9780521813532ws.pdf>. Accessed on 18 September 2023.

Cremean, D.; *et. al.* (2021). Marine Pollution Law. In: **Routledge Handbook of International Environmental Law**. Techera, E.; *et. al.* (eds.), 2nd edition, p. 173. ISBN 978-0.367-68503-4.

Destradi, S. (2023). **Reluctance in World Politics: Why States fail to act decisively**. Bristol: Bristol University Press, p. 15. ISBN 978-1-5292-3023-9.

Dodds, F.; Donoghue, D.; Roesch, J.L. (2017). **Negotiating the Sustainable Development Goals: A transformational agenda for an insecure world**. London; New York: Routledge, p. 5-6. ISBN 9781138695078.

Duvic-Paoli, L.A.; Viñuales, J.E. (2015). Principle 2: Prevention. In: **The Rio Declaration on Environment and Development: A Commentary**. Oxford Commentaries on International Law, Viñuales, J.E. (ed.). Oxford, United Kingdom: Oxford University Press. ISBN 9780199686773.

Farnelli, G.N.; Tanzi, A. (2017). Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter 1972 and 1996 Protocol. In: **Elgar Encyclopedia of Environmental Law**. Cheltenham, UK: Edward Elgar Publishing, p. 175-176. DOI: <https://doi.org/10.4337/9781783477210.V.16>. Available at: [https://www.elgaronline.com/configurable/content/book\\$002f9781785369520\\$002fb-9781783477210-V_16.xml?t:ac=book%24002f9781785369520%24002fb-9781783477210-V_16.xml](https://www.elgaronline.com/configurable/content/book$002f9781785369520$002fb-9781783477210-V_16.xml?t:ac=book%24002f9781785369520%24002fb-9781783477210-V_16.xml). Accessed on 12 July 2023.

Farrelly, T.; *et. al.* (2021). Redressing the Faustian Bargains of Plastics Economies. In: **Plastic Legacies – Pollution, Persistence, and Politics**. AU Press, Athabasca University. DOI: <https://doi.org/10.15215/aupress/9781771993272.01>. ISBN 9781771993289.

Ferreira, H.S. (2012). *Do desenvolvimento ao desenvolvimento sustentável: um dos desafios lançados ao Estado de Direito Ambiental na sociedade de risco*. In: **Repensando o Estado de Direito Ambiental**. Organização: José Rubens Morato Leite, Helene Sivini Ferreira, Matheus Almeida Caetano. Florianópolis: Fundação Boiteux. Pensando o Direito no Século XXI; vol. 3, p. 131. ISBN: 978-85-7840-067-5. Available at: https://repositorio.ufsc.br/bitstream/handle/123456789/99623/VD_Repensando-Estado-FINAL-25-07-2012.pdf?sequence=1&isAllowed=y. 07 December 2021.

Finska, L. (2021). *Confronting the Global Plastics Problem Threatening the Marine Environment: a Framework and Elements of an International Legal Response*. Doctoral dissertation, Faculty of Law, UiT The Arctic University of Norway, p. 158-159. Available at: <https://munin.uit.no/handle/10037/23741>. Accessed on 15 May 2023.

Fitzmaurice, M. (2008). International Responsibility and Liability. In: Oxford Handbook of International Environmental Law. Daniel Bodansky (ed.) *et. al.*, p. 1015. DOI: <https://doi.org/10.1093/oxfordhb/9780199552153.013.0044>. Available at: <https://academic.oup.com/edited-volume/42625/chapter-abstract/358048098?redirectedFrom=fulltext&login=true#no-access-message#no-access-message>. Accessed on 18 May 2023.

Fonseca Junior, G. (2010). **El interés y la regla** – Multilateralismo y Naciones Unidas. Catarata: Madrid, p. 5-7. Colección Desarrollo y Cooperación. ISBN 9788483194850.

Gonçalves, L.C.S. (2020). *Legal remedies against the plastic pollution of the oceans: an analysis of the attempts from public international law and private initiatives to face the plastic soup*. Doctoral Thesis, Maastricht University. ProefschriftMaken. DOI: <https://doi.org/10.26481/dis.20200611lg>. Available at: <https://cris.maastrichtuniversity.nl/en/publications/legal-remedies-against-the-plastic-pollution-of-the-oceans-an-ana-2>. Accessed on 12 February 2022.

Gonçalves, L.R.; Polejack, A.A.S. (2022). *Governança, Cooperação e Diplomacia no Oceano*. In: **Economia Azul – Vetor para o Desenvolvimento do Brasil**. Santos, T.; *et. al.* (Orgs). São Paulo, SP: Essential Idea Editora, p. 139. ISBN 978-65-86394-07-8.

Goodwin, E. (2024). Plastics and biodiversity. In: **Research Handbook on Plastics Regulation** Law, Policy and the Environment. Editors Elizabeth A. Kirk, Naporn Popattanachai, Richard Barnes and Eva R. van der Marel. Cheltenham, UK: Edward Elgar Publishing, p. 103. ISBN: 9781802201512. DOI: <https://doi.org/10.4337/9781802201529>, p. 103. Available at: <https://www.elgaronline.com/edcollbook/book/9781802201529/9781802201529.xml>. Accessed on 23 December 2024.

Groot, B.d.; *et. al.* (2025). Identifying knowledge gaps in the politics of marine plastic pollution. In: **A Research Agenda for Sustainable Ocean Governance**. Justin Alger and U. Rashid Sumaila (eds.). Cheltenham, UK: Edward Elgar Publishing, p. 245-246. ISBN: 978 1 03532 574 0.

Harwell, M.A.; *et. al.* (2013). Characterizing ecological risks, significance, and recovery. In: **Oil in the Environment: Legacies and Lessons of the Exxon Valdez Oil Spill**. Wiens, J. (ed.). Cambridge: Cambridge University Press, p. 383. ISBN 978-1-107-61469-7.

Harris, P.G. (2022). **Routledge Handbook of Marine Governance and Global Environmental Change**. 1st Edition, Routledge: London. ISBN: 9781315149745, 342p. Available at: <https://www.taylorfrancis.com/books/edit/10.4324/9781315149745/routledge-handbook-marine-governance-global-environmental-change-paul-harris>. Accessed on 14 April 2023.

Islam, M.R. (2015). History of the North–South Divide in International Law: Colonial Discourses, Sovereignty, and Self-Determination. In: Alam, S.; *et. al.* (eds.). **International Environmental Law and the Global South**. Cambridge University Press, p. 23. DOI: <https://doi.org/10.1017/CBO9781107295414.003>. Available at: <https://www.cambridge.org/core/books/abs/international-environmental-law-and-the-global-south/history-of-the-northsouth-divide-in-international-law-colonial-discoursesovereignty-and-selfdetermination/CF4988C74A64BEA8FCB9E4CC363B92EF>. Accessed on 13 May 2022.

Jakobsen, I.U.; *et. al.* (2021). The Law of the Sea as Part of the Climate-Change Regime Complex. In: Johansen E, Busch SV, Jakobsen IU, eds. **The Law of the Sea and Climate Change: Solutions and Constraints**. Cambridge University Press, p. 377. ISBN: 9781108907118.

Jung, D. (2023). An International Legal Framework for Marine Plastics Pollution. In: **The Environmental Rule of Law for Oceans: Designing Legal Solutions**. Editors Platjouw FM, Pozdnakova A. Cambridge University Press, p. 48. Available at: <https://www.cambridge.org/core/books/environmental-rule-of-law-for-oceans/an-international-legal-framework-for-marine-plastics-pollution/297AD3C347FCBB475F36881EB558AE65>. Accessed on 13 March 2024.

Kedia, S.; Narula, K. (2022). Oceans and Seas for Sustainable Development: Challenges of global environmental change for SDG14. In: **Routledge Handbook of Marine Governance and Global Environmental Change**. 1st Edition, Routledge: London. ISBN: 9781315149745, 342p. Edited by Paul G. Harris. Available at: <https://www.taylorfrancis.com/books/edit/10.4324/9781315149745/routledge-handbook-marine-governance-global-environmental-change-paul-harris>. Accessed on 14 April 2023.

Kiss, A.; Beurier, J.P. (2000). *Droit international de l'environnement. Quatrième édition*, ISBN: 978-2-233-00598-4, p. 152.

Krantzberg, G.; *et. al.* (2023). **Plastic Pollution – Nature Based Solutions and Effective Governance**. 1st Edition. CRC Press: Boca Raton, p. 6. ISBN 9781003137740. DOI: <https://doi.org/10.1201/9781003137740>. Available at: <https://www.taylorfrancis.com/books/edit/10.1201/9781003137740/plastic-pollution-gail-krantzberg-savitri-jetoo-velma-grover-sandhya-babel>. Accessed on 12 August 2024.

Kohen, M.G. (1997). *Le rôle des principes fondamentaux du droit international*. In: *Possession contestée et souveraineté territoriale*. Genève: Graduate Institute Publications, p. 367-424. ISBN 978-2-940549-20-7.

Koivurova, T. (2014). **Introduction to International Environmental Law**. 1st edition. Abingdon/New York: Routledge, 240p. ISBN 978-0-415-81574-1.

Law, R.J. (2011). Chapter 33 - The Torrey Canyon Oil Spill, 1967. *Oil Spill Science and Technology*, p. 1103-1106. DOI: <https://doi.org/10.1016/B978-1-85617-943-0.10033-4>. Available at: <https://www.sciencedirect.com/science/article/abs/pii/B9781856179430100334>. Accessed on 19 December 2021.

Lacy, P.; Rutqvist, J. (2015). **Waste to Wealth: The Circular Economy Advantage**. London: Palgrave Macmillan (Accenture Strategy), 264 p. ISBN: 978-1-137-53068-4. DOI: 10.1057/9781137530707.

Laganière, G. (2022). **Liability for transboundary pollution at the intersection of public and private international law**. Oxford, UK: Hart Publishing, an imprint of Bloomsbury Publishing, p. 24. ISBN: 978-1-50995-115-4.

Lesniewska, L.; Steenmans, K. (2023). **Circular Economy and the Law: Bringing Justice into the Frame**. 1st Edition. London: Routledge (174 p), p. 72-73. ISBN: 978-0-367-37533-1. DOI: 10.4324/9780429355141.

Lewis, M.; Trouwborst, A. (2017). Bonn Convention on the Conservation of Migratory Species of Wild Animals 1979. In: **Elgar Encyclopedia of Environmental Law**. Cheltenham, UK: Edward Elgar Publishing, p. 33. DOI: <https://doi.org/10.4337/9781783477210.V.2>. Available at: https://www.elgaronline.com/display/book/9781785369520/b-9781783477210-V_2.xml. Accessed on 14 November 2023.

Makomere, R.; Mbeva, K.L. (2019). Contested Multilateralism – Toward Aligning Regimes for Ocean and Climate Governance. In: **Climate Change and Ocean Governance – Politics and Policy for Threatened Seas**. Harris, P.G. (ed.). Cambridge University Press: United Kingdom, 2019, p. 263. ISBN 978-1-108-42248-2.

Manyara, P.; Raubenheimer, K.; Sadan, Z. (2022). Legal and Policy Frameworks to Address Marine Litter Through Improved Livelihoods. In: **The African Marine Litter Outlook**. Editors Thomas Maes, Fiona Preston-Whyte, Springer Cham, p. 142. DOI: <https://doi.org/10.1007/978-3-031-08626-7>. Available at: https://link.springer.com/chapter/10.1007/978-3-031-08626-7_4. Accessed on 7 August 2024.

Marchisio, S. (2017). *Il diritto internazionale dell'ambiente*. In: **Diritto Ambientale - Profili Internazionali, europei e comparati**. Terza edizione (eds. Giovanni Cordini, Paolo Fois, Sergio Marchisio). G. Giappichelli Editore, p. 13.

McCaffrey, S.C. (2019). **The Law of International Watercourses**. 3rd Edition. General Editor: Sir Franklin Berman KCMG QC. Oxford University Press: United Kingdom, p. 421. ISBN: 9780198736929.

Mendenhall, E. (2019). The Ocean Governance Regime International Conventions and Institutions. In: **Climate Change and Ocean Governance – Politics and Policy for Threatened Seas**. Harris, P.G. (ed.). Cambridge University Press: United Kingdom, 2019, p. 27. ISBN 978-1-108-42248-2.

Nagtzaam, G.; *et. al.* (2023). Current International Law and Plastic. In: **Global plastic pollution and its regulation** – History, Trends, Perspectives. Massachusetts: Edward Elgar Publishing, 376 p. ISBN: 978 1 80037 354 9. DOI: <http://dx.doi.org/10.4337/9781800373556>. Available at: <https://www.elgaronline.com/monobook/book/9781800373556/9781800373556.xml>. Accessed on 17 November 2024.

Nollkaemper, A. (2014). Introduction. In: **Principles of Shared Responsibility in International Law: An Appraisal of the State of the Art**. Nollkaemper, A.; Plakokefalos, I. (eds). Cambridge University Press, p. 6-7. DOI: <https://doi.org/10.1017/CBO9781139940009.002>. Available at: <https://www.cambridge.org/core/books/abs/principles-of-shared-responsibility-in-international-law/introduction/FFA9535BDA5EE4E726239DB48196E832>. Accessed on 18 May 2023.

Nusdeo, A.M.O. (2016). *Pagamento por Serviços Ambientais*. **Direito Ambiental e Sustentabilidade**. Eds. Arlindo Philippi Jr., Vladimir Passos de Freitas, Ana Luiza Silva Spíndola. Barueri, SP: Manole, 2016. Coleção Ambiental, vol. 18, p. 619-643. ISBN 978-85-204-3922-7.

Nwabueze, J.N.; Techera, E. (2021). International Environmental Law and Climate Change. In: **Routledge Handbook of International Environmental Law**. Techera, E.; *et. al.* (eds.), 2nd edition. ISBN 978-0.367-68503-4.

Peel, J.; Osofsky, H.M. (2015). **Climate Change Litigation: Regulatory Pathways to Cleaner Energy**. Cambridge: Cambridge University Press. ISBN 978-1-107-03606-2.

Proelß, A. (2017). **The United Nations Convention on the Law of the Sea A Commentary**. 1st Edition, Bloomsbury Publishing, 2048 p. ISBN: 9781849461924.

Punka, A.K. (2023). **Towards an effective global plastics treaty** - A legal analysis of treaty design elements to promote participation and effectiveness. Master thesis presented to the *Universitetet i Oslo (UiO) Det juridiske fakultet*, p. 39. Available at: <https://www.duo.uio.no/bitstream/handle/10852/104616/218.pdf?sequence=1&isAllowed=y>. Accessed on 19 August 2024.

Roe, M. (2013). Governance. In: **Maritime Governance and Policy-Making**. London: Springer, p. 41-42. ISBN 978-1-4471-4152-5.

Ryan, P.G. (2015). A Brief History of Marine Litter Research. In: **Marine Anthropogenic Litter**. Editors Bergmann, M., Gutow, L., Klages, M. Springer, Cham, p. 14. DOI: https://doi.org/10.1007/978-3-319-16510-3_1. Available at: https://link.springer.com/chapter/10.1007/978-3-319-16510-3_1. Accessed on 17 January 2024.

Sands, P.; *et. al.* (2018). **Principles of International Environmental Law**. 4th ed., Cambridge: Cambridge University Press, p. 43. ISBN 978-1-108-42095-2.

Sweet, W. (2016). **Climate Diplomacy from Rio to Paris: The Effort to Contain Global Warming**. Yale University Press, New Haven and London, p. 3-4. ISBN 9780300224771.

Schäli, J. (2022). **The Mitigation of Marine Plastic Pollution in International Law – Facts, Policy and Legal Implications**. Leiden, The Netherlands: Brill | Nijhoff, p. 287. DOI: <https://doi.org/10.1163/9789004508613>. Available at: <https://brill.com/display/title/61770>. Accessed on 19 September 2023.

Silva, S.T.; Leuzinger, M.D. (2019). *Os desafios de criação e gestão das áreas marinhas protegidas no Brasil à luz dos objetivos do desenvolvimento sustentável*. In: Mont'alverne, T.F., Silva, S. T.; Oliveira, C.C.; Galindo, G.R.B. **Meio Ambiente Marinho, Sustentabilidade e Direito vol. I – A conservação e a preservação dos recursos marinhos na zona costeira, na plataforma continental e nos fundos marinhos**. Rio de Janeiro: Lumen Juris, p. 121-148. ISBN: 978-85-519-1465-6.

Stoett, P.J.; Mulligan, S. (2019). Governance gaps and Green Goals. In: **Global Ecopolitics – Crisis, Governance, and Justice**. 2nd Edition, University of Toronto Press: Canada, p. 181-182. ISBN 9781487587901.

Stoett, P.; Vince, J. (2019). The Plastic-Climate Nexus – Linking Science, Policy, and Justice. In: **Climate Change and Ocean Governance – Politics and Policy for Threatened Seas**. Harris, P.G. (ed.). Cambridge University Press: United Kingdom, 2019, p. 354. ISBN 978-1-108-42248-2.

Taylor, P. (2023). Ocean Acidification and the Anthropocene: An Emergency Response. In: **The Routledge Handbook of Law and the Anthropocene**. 1st edition, Burdon, P.D.; Martel, J. (eds.). Oxford: Routledge, p. 132. ISBN 9781032482491.

Telesetsky, A; Bratspies, R. (2021). Marine Environmental Law: UNCLOS, ocean governance and fisheries. In: **Routledge Handbook of International Environmental Law**. Techera, E.; *et. al.* (eds.), 2nd edition. ISBN 978-0-367-68503-4.

van der Marel, E. R. (2024). Plastics regulation and international trade. In: **Research Handbook on Plastics Regulation Law, Policy and the Environment**. Editors Elizabeth A. Kirk, Naporn Popattanachai, Richard Barnes and Eva R. van der Marel. Cheltenham, UK: Edward Elgar Publishing, p. 145. ISBN: 978 1 80220 151 2. DOI: <https://doi.org/10.4337/9781802201529>. Available at: <https://www.elgaronline.com/edcollbook/book/9781802201529/9781802201529.xml>. Accessed on 23 December 2024.

Viñuales, J.E. (2015). The Rio Declaration on Environment and Development: Preliminary Study. In: **The Rio Declaration on Environment and Development: A Commentary**. Oxford Commentaries on International Law, Viñuales, J.E. (ed.). Oxford, United Kingdom: Oxford University Press, p. 90. ISBN 9780199686773.

Voigt, C. (2015). Principle 8: Sustainable Patterns of Production and Consumption and Demographic Policies. In: **The Rio Declaration on Environment and Development: A Commentary**. Oxford Commentaries on International Law, Viñuales, J.E. (ed.). Oxford, United Kingdom: Oxford University Press, p. 414. ISBN 9780199686773.

Voigt, C. (2023). Oceans and Climate Change: Implications for UNCLOS and the UN Climate Regime. In: **The Environmental Rule of Law for Oceans: Designing Legal Solutions**. Platjouw, F.M.; Pozdnakova, A. (eds.). Cambridge: Cambridge University Press, p. 17-30. DOI: <https://doi.org/10.1017/9781009253741.006>. Available at: <https://www.cambridge.org/core/services/aop-cambridge->

core/content/view/CC543E90CAAA4CF7E0314815DB0BC315/9781009253765c2_17-30.pdf/oceans-and-climate-change.pdf. Accessed on 16 May 2024.

B) Articles from journals

Ali, N.; *et al.* (2024). Insight into microplastics in the aquatic ecosystem: Properties, sources, threats and mitigation strategies. **Science of The Total Environment**, vol. 913, p. 10. DOI: <https://doi.org/10.1016/j.scitotenv.2023.169489>. Available at: <https://www.sciencedirect.com/science/article/pii/S0048969723081196>. Accessed on 19 December 2024.

Alter, K.J.; Raustiala, K. (2018). The Rise of International Regime Complexity. **Annual Review of Law and Social Science**, vol. 14, p. 333. Available at: <https://www.annualreviews.org/content/journals/10.1146/annurev-lawsocsci-101317-030830>. Accessed on 12 June 2024.

Ammendolia, J.; Walker, T.R. (2022b). Global plastics treaty must be strict and binding. **Nature**, vol. 611, n. 236. DOI: 10.1038/d41586-022-03581-z. Available at: <https://pubmed.ncbi.nlm.nih.gov/36347957/>. Accessed on 17 February 2023.

Andriamahefazafy, M.; *et al.* (2022). Sustainable development goal 14: To what degree have we achieved the 2020 targets for our oceans? **Ocean & Coastal Management**, vol. 227, p. 1. DOI: <https://doi.org/10.1016/j.ocecoaman.2022.106273>. Available at: <https://www.sciencedirect.com/science/article/pii/S0964569122002496>. Accessed on 09 May 2023.

Apete, L.; Martin, O.V.; Iacovidou, E. (2024). Fishing plastic waste: Knowns and known unknowns. **Marine Pollution Bulletin**, vol. 205. DOI: <https://doi.org/10.1016/j.marpolbul.2024.116530>. Available at: <https://www.sciencedirect.com/science/article/pii/S0025326X24005071#bb5070>. Accessed on 19 April 2024.

Ashraf, M.A. (2017). Persistent organic pollutants (POPs): a global issue, a global challenge. **Environmental Science and Pollution Research**, vol. 24, p. 4223–4227. DOI: <https://doi.org/10.1007/s11356-015-5225-9>. Available at: <https://link.springer.com/article/10.1007/s11356-015-5225-9>. Accessed on 13 June 2023.

Bachmann, M.; *et al.* (2023). Towards circular plastics within planetary boundaries. **Nature Sustainability**, vol. 6, p. 599. Available at: <https://www.nature.com/articles/s41893-022-01054-9>. Accessed on 20 March 2024.

Barrett, J.R. (2013). POPs vs. Fat: Persistent Organic Pollutant Toxicity Targets and Is Modulated by Adipose Tissue. **Environmental Health Perspectives**, vol. 121, n. 2. DOI: 10.1289/ehp.121-a61. Available at: <https://pmc.ncbi.nlm.nih.gov/articles/PMC3569705/>. Accessed on 17 July 2024.

Barros-Plataiu, A.F.; *et al.* (2015). *Correndo para o mar no antropoceno: a complexidade da governança dos oceanos e a estratégia brasileira de gestão dos recursos marinhos*. **Revista de Direito Internacional**, vol. 12, n. 1. Available at: <https://www.arqcom.uniceub.br/rdi/article/view/3292>. Accessed on 26 December 2023.

Barrowclough, D.; Birkbeck, C.D. (2022). Transforming the Global Plastics Economy: The Role of Economic Policies in the Global Governance of Plastic Pollution. **Social**

Sciences, vol. 11(1), n. 26, p. 18. DOI: <https://doi.org/10.3390/socsci11010026>. Available at: <https://www.mdpi.com/2076-0760/11/1/26>. Accessed on 13 August 2024.

Bashir, M.A.; *et al.* (2025). Plastic waste gasification for low-carbon hydrogen production: a comprehensive review. **Energy Advances**, 34p. Themed collection Energy Advances Recent Review Articles. DOI: <https://doi.org/10.1039/D4YA00292J>. Available at: <https://pubs.rsc.org/en/content/articlelanding/2025/ya/d4ya00292j>. Accessed on 13 February 2025.

Beaumont, N.J.; *et al.* (2019). Global ecological, social and economic impacts of marine plastic. **Marine Pollution Bulletin**, vol. 142, p. 189-193. DOI: <https://doi.org/10.1016/j.marpolbul.2019.03.022>. Available at: <https://www.sciencedirect.com/science/article/pii/S0025326X19302061?via%3Dihub>. Accessed on 27 December 2021.

Beltran, M.; *et al.* (2024). Rethinking marine plastics pollution: Science diplomacy and multi-level governance. **International Review of Administrative Sciences**, vol. 90, n. 1, p. 237-258. Available at: <https://journals.sagepub.com/doi/full/10.1177/00208523231183909>. Accessed on 06 May 2024.

Berlino, M.; *et al.* (2021). Effects of microplastics on the functional traits of aquatic benthic organisms: A global-scale meta-analysis. **Environmental Pollution**, vol. 285. DOI: <https://doi.org/10.1016/j.envpol.2021.117174>. Available at: <https://www.sciencedirect.com/science/article/pii/S0269749121007569>. Accessed on 25 August 2024.

Biermann, F.; *et al.* (2009). The Fragmentation of Global Governance Architectures: A Framework for Analysis. **Global Environmental Politics**, vol. 9, n. 4, p. 14–40. DOI: <https://doi.org/10.1162/glep.2009.9.4.14>. Available at: <https://direct.mit.edu/glep/article-abstract/9/4/14/14757/The-Fragmentation-of-Global-Governance?redirectedFrom=fulltext>. Accessed on 15 March 2023.

Bishop, G.; *et al.* (2020). Recycling of European plastic is a pathway for plastic debris in the ocean. **Environmental International**, vol. 142, p. 2. Available at: <https://www.sciencedirect.com/science/article/pii/S0160412020318481>. Accessed on 11 June 2023.

Boon, K. (1992). The Rio Declaration and its Influence on International Environmental Law. **Singapore Journal of Legal Studies**, p. 347-364. Available at: <https://www.jstor.org/stable/24866183>. Accessed on 13 March 2022.

Borgese, E.M.; Chircop, A.; McConnell, M.L. (2003). Montreal Declaration on the Protection of the Marine Environment from Land-Based Activities. In: **Ocean Yearbook**, vol. 17, n. 1. University of Chicago Press. DOI: <https://doi.org/10.1163/221160003X00339>. Available at: https://brill.com/view/journals/ocyo/17/1/article-p962_.xml. Accessed on 15 February 2024.

Borja, J.; *et al.* (2005). Polychlorinated biphenyls and their biodegradation. **Process Biochemistry**, vol. 40, n. 6, p. 2000. Available at:

<https://www.sciencedirect.com/science/article/pii/S0032959204003620>. Accessed on 14 May 2022.

Borrelle, S.B.; *et al.* (2017). Why we need an international agreement on marine plastic pollution. **Proceedings of the National Academy of Sciences**, vol. 114, n. 38, p. 9994. Available at: <https://www.pnas.org/doi/pdf/10.1073/pnas.1714450114>. Accessed on 12 April 2024.

Bourdin, S.; Jacquet, N. (2025). Closing the loop at the local scale: Investigating the drivers of and barriers to the implementation of the circular economy in cities and regions. **Ecological Economics**, vol. 231, p. 12. DOI: <https://doi.org/10.1016/j.ecolecon.2025.108542>. Available at: <https://www.sciencedirect.com/science/article/pii/S0921800925000254>. Accessed on 10 February 2025.

Bowyer, C.; Fletcher, S. (2025). We need a global agreement to safeguard human health from plastic pollution. **BMJ**, vol. 388, p. 1. DOI: <http://doi.org/10.1136/bmj.q2890>. Available at: <https://www.bmj.com/content/bmj/388/bmj.q2890.full.pdf>. Accessed on 25 January 2025.

Broekema, W. (2015). Crisis-Induced Learning and Issue Politicization in the EU: The Braer, Sea Empress, Erika, And Prestige Oil Spill Disasters. **Public Administration**, vol. 94, n. 2, p. 389. DOI: <https://doi.org/10.1111/padm.12170>. Available at: https://onlinelibrary.wiley.com/doi/epdf/10.1111/padm.12170?saml_referrer. Accessed on 17 December 2021.

Brooks, A.L.; *et al.* (2018). The Chinese import ban and its impact on global plastic waste trade. **Science Advances**, vol. 4, n. 6, p. 1. Available at <https://www.science.org/doi/pdf/10.1126/sciadv.aat0131>. Accessed on 22 May 2023.

Burlakovs, J.; *et al.* (2017). Paradigms on landfill mining: From dump site scavenging to ecosystem services revitalization. **Resources, Conservation and Recycling**, vol. 123, p. 74. DOI: <https://doi.org/10.1016/j.resconrec.2016.07.007>. Available at: <https://www.sciencedirect.com/science/article/pii/S0921344916301707>. Accessed on 07 June 2023.

Cabernard, L.; *et al.* (2022). Growing environmental footprint of plastics driven by coal combustion. **Nature Sustainability**, vol. 5, p. 149. Available at: <https://www.nature.com/articles/s41893-021-00807-2>. Accessed on 02 April 2024.

Carlini, G.; Kleine, K. (2018). Advancing the international regulation of plastic pollution beyond the United Nations Environment Assembly resolution on marine litter and microplastics. **RECIEL - Review of European, Comparative & International Environmental Law**, vol. 27, n. 3, Special Issue:Plastics Regulation, p. 236. DOI: <https://doi.org/10.1111/reel.12258>. Available at: <https://onlinelibrary.wiley.com/doi/10.1111/reel.12258>. Accessed on 10 August 2024.

Carpenter, E.J.; Smith, K.L.Jr.(1972). Plastics on the Sargasso Sea Surface. **Science**, vol. 175, n. 4027, pp. 1240-1241. DOI: [10.1126/science.175.4027.1240](https://doi.org/10.1126/science.175.4027.1240). Available at: <https://www.science.org/doi/abs/10.1126/science.175.4027.1240>. Accessed on 17 January 2023.

Chan, N. (2024). Voluntary commitments for ocean sustainability: Comparing the UN Ocean Conference and Our Ocean Conference platforms. **Marine Policy**, vol. 160, p. 1. DOI: <https://doi.org/10.1016/j.marpol.2023.105956>. Available at: <https://www.sciencedirect.com/science/article/pii/S0308597X2300489X>. Accessed on 18 November 2024.

Chang, Y.-C.; Saqib, M. (2025). International Legal Systems in Tackling the Marine Plastic Pollution: A Critical Analysis of UNCLOS and MARPOL. **Water**, 17(10), 1547. DOI: <https://doi.org/10.3390/w17101547>. Available at: <https://www.mdpi.com/2073-4441/17/10/1547>. Accessed on 30 August 2025.

Charlton-Howard, H.S.; *et al.* (2023) 'Plasticosis': Characterising macro- and microplastic-associated fibrosis in seabird tissues. **Journal of Hazardous Materials**, vol. 450. Available at: <https://www.sciencedirect.com/science/article/pii/S0304389423003722?via%3Dihub>. Accessed on 20 March 2024.

Chartres, N.; *et al.* (2024). Effects of Microplastic Exposure on Human Digestive, Reproductive, and Respiratory Health: A Rapid Systematic Review. **Environmental Science & Technology**, DOI: <https://doi.org/10.1021/acs.est.3c09524o>. Available at: <https://pubs.acs.org/doi/10.1021/acs.est.3c09524>. Accessed on 27 December 2024.

Chen, Y.; *et al.* (2019). Life cycle assessment of end-of-life treatments of waste plastics in China. **Resources, conservation and recycling**, vol. 146, p. 348. DOI: <https://doi.org/10.1016/j.resconrec.2019.03.011>. Available at: <https://www.sciencedirect.com/science/article/pii/S092134491930117X>. Accessed on 19 September 2024.

Chen, Z.; *et al.* (2024). Upcycling of plastic wastes for hydrogen production: Advances and perspectives. **Renewable and Sustainable Energy Reviews**, vol. 195, p. 16. DOI: <https://doi.org/10.1016/j.rser.2024.114333>. Available at: <https://www.sciencedirect.com/science/article/pii/S136403212400056X>. Accessed on 13 February 2025.

Claudet, J.; *et al.* (2020). A Roadmap for Using the UN Decade of Ocean Science for Sustainable Development in Support of Science, Policy, and Action. **One Earth**, vol. 2, n. 1, p. 36. DOI: <https://doi.org/10.1016/j.oneear.2019.10.012>. Available at: <https://www.sciencedirect.com/science/article/pii/S2590332219300934>. Accessed on 28 December 2021.

Clift, R.; *et al.* (2019). Managing Plastics: Uses, Losses and Disposal. **Law Environment and Development Journal**, vol. 15/2, p. 104. Article - Special issue on designing law and policy towards managing plastics in a circular economy. Available at: <https://eprints.soas.ac.uk/33067/1/19093.pdf>. Accessed on 06 June 2023.

Corona, B.; *et al.* (2019). Towards sustainable development through the circular economy – A review and critical assessment on current circularity metrics. **Resources, Conservation and Recycling**, vol. 151, p. 1. DOI: <https://doi.org/10.1016/j.resconrec.2019.104498>. Available at: <https://www.sciencedirect.com/science/article/pii/S0921344919304045?via%3Dihub>. Accessed on 17 May 2022.

- Cowan, E. (2024). Event Ethnography to study the global negotiations on the treaty to end plastic pollution: dataset from the first session of negotiations (INC-1). **Journal of Environmental Studies and Sciences**, p. 5. DOI: <https://doi.org/10.1007/s13412-024-00914-4>. Available at: <https://link.springer.com/article/10.1007/s13412-024-00914-4>. Accessed on 20 April 2024.
- Cowger, W.; *et al.* (2024). Global producer responsibility for plastic pollution. **Science Advances**, vol. 10, p. 3. Available at: <https://www.science.org/doi/epdf/10.1126/sciadv.adj8275>. Accessed on 29 April 2024.
- Cuellar-Ramirez, P. (2021). Science Diplomacy for Climate Action and Sustainable Development in Latin America and the Caribbean: How Important Is the Early Career Perspective to New Governance? **Frontiers in Research Metrics and Analytics**, vol. 6, p. 1. DOI: <https://doi.org/10.3389/frma.2021.657771>. Available at: <https://www.frontiersin.org/journals/research-metrics-and-analytics/articles/10.3389/frma.2021.657771/full>. Accessed on 02 April 2024.
- da Costa, J.P.; *et al.* (2020). The Role of Legislation, Regulatory Initiatives and Guidelines on the Control of Plastic Pollution. **Frontiers in Environmental Science**, Sec. Toxicology, Pollution and the Environment, vol. 8, p. 7. DOI: <https://doi.org/10.3389/fenvs.2020.00104>. Available at: <https://www.frontiersin.org/journals/environmental-science/articles/10.3389/fenvs.2020.00104/full>. Accessed on 13 August 2024.
- Darmon, G.; *et al.* (2022). Drivers of litter ingestion by sea turtles: Three decades of empirical data collected in Atlantic Europe and the Mediterranean. **Marine Pollution Bulletin**, vol. 185, Part B, p. 2. DOI: <https://doi.org/10.1016/j.marpolbul.2022.114364>. Available at: <https://www.sciencedirect.com/science/article/pii/S0025326X22010463>. Accessed on 13 September 2023.
- DaronchI, O.T.; *et al.* (2020). *Contaminação ambiental em larga escala por Bisfenol-A: estamos conscientes do risco e formas de exposição?* **Ciência & Saúde Coletiva**, vol. 25, n. 11, p. 4340. ISSN 1678-4561. Available at: <https://cienciaesaudecoletiva.com.br/artigos/contaminacao-ambiental-em-larga-escala-por-bisfenola-estamos-conscientes-do-risco-e-formas-de-exposicao/17074?id=17074>. Accessed on 13 December 2021.
- Dauvergne, P. (2018). Why is the global governance of plastic failing the oceans? **Global Environmental Change**, vol. 51, p. 22-31, ISSN 0959-3780, DOI: <https://doi.org/10.1016/j.gloenvcha.2018.05.002>. Available at: <https://www.sciencedirect.com/science/article/abs/pii/S0959378017314140>. Accessed on 30 October 2022.
- Dayrit, F.M. (2022). Circular Plastics Economy: Redesigning Technology and Reimagining Society. **Transactions of the National Academy of Science and Technology**, vol. 44, p. 1. DOI: doi.org/10.57043/transnastphl.2022.2570. Available at: <https://transactions.nast.ph/?p=2570>. Accessed on 06 June 2024.
- Desing, H.; *et al.* (2020). A circular economy within the planetary boundaries: Towards a resource-based, systemic approach. **Resources, Conservation and Recycling**, vol. 155, p. 2. Available at <https://www.sciencedirect.com/science/article/pii/S0921344919305798>. Accessed on 10 August 2023.

Diniz, A.C. (2017). *Os direitos das crianças no âmbito internacional: uma perspectiva Soft Law e Hard Law*. **Revista das Faculdades Integradas Vianna Júnior**, vol. 8, n. 2, p. 390. ISSN 2177 3726. Available at: http://www.egov.ufsc.br/portal/sites/default/files/247-texto_do_artigo-458-1-10-20171213.pdf. Accessed on 04 November 2021.

Doğan, E.Ö.; *et. al.* (2020). Can science diplomacy address the global climate change challenge. **Environmental Policy and Governance**, vol. 31, n. 1, p. 31. Available at: <https://onlinelibrary.wiley.com/doi/epdf/10.1002/eet.1911>. Accessed on 02 May 2024.

Downs, G.W.; *et. al.* (2000). The Transformational Model of International Regime Design: Triumph of Hope or Experience. **Columbia Journal of Transnational Law**, vol. 38, p. 465. Available at: <https://heinonline.org/HOL/LandingPage?handle=hein.journals/cjtl38&div=22&id=&page=>. Accessed on 30 April 2022.

Du, Y.; *et. al.* (2022). A review on marine plastisphere: biodiversity, formation, and role in degradation. **Computational and Structural Biotechnology Journal**, vol. 20, 975-988. Available at: <https://www.sciencedirect.com/science/article/pii/S2001037022000459>. Accessed on 09 January 2022.

Fadeeva, Z.; Van Berkel, R. (2021). Unlocking circular economy for prevention of marine plastic pollution: An exploration of G20 policy and initiatives. **Journal of Environmental Management**, vol. 277, 111457. DOI: <https://doi.org/10.1016/j.jenvman.2020.111457>. Available at: <https://www.sciencedirect.com/science/article/abs/pii/S0301479720313827?via%3Dihub>. Accessed on 07 February 2022.

Fehling, M.; Nelson, B. D.; Venkatapuram, S. (2013). Limitations of the Millennium Development Goals: a literature review. **Global Public Health**, vol. 8, n. 10, p. 1110-1117. DOI: <https://doi.org/10.1080/17441692.2013.845676>. Available at: <https://www.tandfonline.com/doi/full/10.1080/17441692.2013.845676>. Accessed on 3 April 2023.

Finska, L.; Howden, J.G. (2018). Troubled waters – Where is the bridge? Confronting marine plastic pollution from international watercourses. **RECIEL - Review of European, Comparative & International Environmental Law**, vol. 27, n. 3, Special Issue: Plastics Regulation, p. 248. DOI: <https://doi.org/10.1111/reel.12257>. Available at: <https://onlinelibrary.wiley.com/doi/10.1111/reel.12257>. Accessed on 14 November 2023.

Ford, H.V.; *et. al.* (2022). The fundamental links between climate change and marine plastic pollution. **Science of The Total Environment**, vol. 806, Part 1. ISSN 0048-9697. Available at: <https://www.sciencedirect.com/science/article/pii/S0048969721054693>. Accessed on 25 March 2024.

Ford, J.H.; Wilcox, C. (2019). Shedding light on the dark side of maritime trade – A new approach for identifying countries as flags of convenience. **Marine Policy**, vol. 99, p. 298. DOI: <https://doi.org/10.1016/j.marpol.2018.10.026>. Available at:

<https://www.sciencedirect.com/science/article/pii/S0308597X18303257>. Accessed on 17 April 2024.

Galgani, F.; Rangel-Buitrago, N. (2024). White tides: the plastic nurdles problem. **Journal of Hazardous Materials**, vol. 470, p. 1. DOI: <https://doi.org/10.1016/j.jhazmat.2024.134250>. Available at: <https://www.sciencedirect.com/science/article/pii/S030438942400829X>. Accessed on 11 February 2025.

Galgani, L.; *et al.* (2022). Hitchhiking into the Deep: How Microplastic Particles are Exported through the Biological Carbon Pump in the North Atlantic Ocean. **Environmental Science & Technology**, vol. 56, p. 15638–15649. DOI: <https://doi.org/10.1021/acs.est.2c04712>. Available at: <https://www.plasticseal.dk/media/temb4aw0/galgani-et-al-2022-hitchhiking-into-the-deep-how-microplastic-particles-are-exported-through-the-biological-carbon-pump.pdf>. Accessed on 12 April 2023.

Gallo, N.; *et al.* (2017). Ocean commitments under the Paris Agreement. **Nature Climate Change**, vol. 7, p. 835. DOI: <https://doi.org/10.1038/nclimate3422>. Available at: <https://www.nature.com/articles/nclimate3422>. Accessed on 18 September 2024.

Geyer, R.; *et al.* (2017). Production, use, and fate of all plastics ever made. **Science Advances**, vol 3, n. 7, p. 1. DOI: 10.1126/sciadv.1700782 Available at: <https://www.science.org/doi/10.1126/sciadv.1700782>. Accessed on 11 June 2023.

Ghosh, S.; *et al.* (2023). Microplastics as an Emerging Threat to the Global Environment and Human Health. **Sustainability**, vol. 15, n. 14. DOI: <https://doi.org/10.3390/su151410821> Available at: <https://www.mdpi.com/2071-1050/15/14/10821>. Accessed on 12 May 2024.

Gluckman, P.D.; *et al.* (2017). Science Diplomacy: A Pragmatic Perspective from the Inside. **Science & Diplomacy**, vol. 6, n. 4, p. 2. Available at: https://www.sciencediplomacy.org/sites/default/files/pragmatic_perspective_science_advice_dec2017_1.pdf. Accessed on 12 April 2024.

Gonçalves, L.C.S. (2019). The Effects of Plastics on Climate Change: An Analysis of the Potential Responses within the Nationally Determined Contributions (NDCs). **Yearbook of International Environmental Law**, vol. 30, n. 1, p. 165-192. Available at: <https://academic.oup.com/yielaw/article-abstract/30/1/165/6362691?redirectedFrom=fulltext>. Accessed on 20 March 2024.

Gregson, N.; *et al.* (2015). Interrogating the circular economy: the moral economy of resource recovery in the EU. **Economy and Society**, vol. 44, n. 2, p. 220. DOI: <https://doi.org/10.1080/03085147.2015.1013353>. Available at: <https://www.tandfonline.com/doi/full/10.1080/03085147.2015.1013353?scroll=top&neededAccess=true>. Accessed on 07 July 2023.

Guggisberg, S. (2024). Finding equitable solutions to the land-based sources of marine plastic pollution: Sovereignty as a double-edged sword. **Marine Policy**, vol. 159, p. 2. DOI: <https://doi.org/10.1016/j.marpol.2023.105960>. Available at: <https://www.sciencedirect.com/science/article/pii/S0308597X23004931>. Accessed on 12 November 2024.

- Guilloux, B; Schumm, R. (2016). Which International Law for Ocean and Climate? **Ocean and Climate Scientific Notes**, vol. 2, n. 2, p. 79. Available at: https://www.ocean-climate.org/wp-content/uploads/2017/03/international-law-161024_ScientificNotes_Oct2016_BD_ppp-14.pdf. Accessed on 21 August 2023.
- Guterman, L. (2009). Exxon Valdez Turns 20. **Science**, vol. 323, n. 5921, p. 1558-1559. DOI: 10.1126/science.323.5921.1558. Available at: <https://www.science.org/doi/abs/10.1126/science.323.5921.1558>. Accessed on 03 March 2022.
- Guzman, A.T. (2005). The Design of International Agreements. **The European Journal of International Law**, vol. 16, n. 4, p. 579–612. DOI: 10.1093/ejil/chi134. Available at: <https://academic.oup.com/ejil/article-pdf/16/4/579/18272535/chi134.pdf>. Accessed on 22 May 2024.
- Guzzetti, E.; *et al.* (2018). Microplastic in marine organism: Environmental and toxicological effects. **Environmental Toxicology and Pharmacology**, vol. 64, p. 164. DOI: <https://doi.org/10.1016/j.etap.2018.10.009>. Available at: <https://www.sciencedirect.com/science/article/pii/S1382668918303934>. Accessed on 22 April 2022.
- Haas, B.; *et al.* (2022). The future of ocean governance. **Reviews in Fish Biology and Fisheries**, vol. 32, p. 254. DOI: <https://doi.org/10.1007/s11160-020-09631-x>. Available at: <https://link.springer.com/article/10.1007/s11160-020-09631-x>. Accessed on 22 June 2023.
- Hajji, A.L.; Lucas, K.N. (2024). Anthropogenic stressors and the marine environment: From sources and impacts to solutions and mitigation. **Marine Pollution Bulletin**, vol. 205, p. 2. DOI: <https://doi.org/10.1016/j.marpolbul.2024.116557>. Available at: <https://www.sciencedirect.com/science/article/pii/S0025326X24005344>. Accessed on 18 November 2024.
- Hartmann, N.B.; *et al.* (2019). Are We Speaking the Same Language? Recommendations for a Definition and Categorization Framework for Plastic Debris. **Environmental Science and Technology**, vol. 53, 1039-1047, p. 1045. Available at: <https://pubs.acs.org/doi/pdf/10.1021/acs.est.8b05297>. Accessed on 13 January 2022.
- Hatje, V.; *et al.* (2021). Pollutants in the South Atlantic Ocean: Sources, Knowledge Gaps and Perspectives for the Decade of Ocean Science. **Frontiers in Marine Science**, vol. 8, p. 11. DOI: 10.3389/fmars.2021.644569. Available at: <https://www.frontiersin.org/journals/marine-science/articles/10.3389/fmars.2021.644569/full>. Accessed on 14 October 2022.
- He, Z.; *et al.* (2015). Pollution characteristics and health risk assessment of volatile organic compounds emitted from different plastic solid waste recycling workshops. **Environment International**, vol. 77, p. 86. DOI: <https://doi.org/10.1016/j.envint.2015.01.004>. Available at: <https://www.sciencedirect.com/science/article/pii/S0160412015000082>. Accessed on 06 June 2023.

Hsu, W.T.; *et al.* (2022). Closing the loop on plastics in Europe: The role of data, information and knowledge. **Sustainable Production and Consumption**, vol. 33, p. 944. DOI: <https://doi.org/10.1016/j.spc.2022.08.019>. Available at: <https://www.sciencedirect.com/science/article/pii/S2352550922002251>. Accessed on 21 May 2023.

Husaini, D.C.; *et al.* (2024). Plastic Waste in Latin America and the Caribbean (LAC): Impact on the Environment and Public Health—A Systematic Review. **Journal of Toxicology**, vol. 2024, p. 6. DOI: <https://doi.org/10.1155/2024/5698516>. Available at: <https://onlinelibrary.wiley.com/doi/epdf/10.1155/2024/5698516>. Accessed on 03 May 2024.

Irwin, A. (2018). How to Solve a Problem Like Plastics. **New Scientist**, vol. 238, n. 3178, p. 31. DOI: [https://doi.org/10.1016/S0262-4079\(18\)30884-4](https://doi.org/10.1016/S0262-4079(18)30884-4). Available at: <https://www.sciencedirect.com/science/article/abs/pii/S0262407918308844?via%3Dihub>. Accessed on 13 April 2022.

Jambeck, J.R.; *et al.* (2015). Plastic waste inputs from land into the ocean. **Science**, vol. 347, n. 6223, p. 768. DOI: 10.1126/science.1260352. Available at: <https://www.science.org/doi/10.1126/science.1260352>. Accessed on 17 June 2022.

Japiassú, C.E.; Guerra, I.F. (2017). *30 anos do relatório Brundtland: nosso futuro comum e o desenvolvimento sustentável como diretriz constitucional brasileira*. **Revista de Direito da Cidade**, vol. 9, n. 4. Available at: <https://www.e-publicacoes.uerj.br/index.php/rdc/article/view/30287/23220>. Accessed on 19 December 2021.

Jeong, E.; Lee, J.Y.; Redwan, M. (2024). Animal exposure to microplastics and health effects: A review. **Emerging Contaminants**, vol. 10, n. 4, 100369, ISSN 2405-6650, DOI: <https://doi.org/10.1016/j.emcon.2024.100369>. Available at: <https://www.sciencedirect.com/science/article/pii/S2405665024000702>. Accessed on 17 November 2024.

Jones, P.H.; *et al.* (1978). Birds oiled during the Amoco Cadiz incident – An interim report. **Marine Pollution Bulletin**, vol. 9, n. 11, p. 307-310. DOI: [https://doi.org/10.1016/0025-326X\(78\)90256-4](https://doi.org/10.1016/0025-326X(78)90256-4). Available at: <https://www.sciencedirect.com/science/article/pii/0025326X78902564>. Accessed on 19 December 2021.

Jouffray, J.B.; *et al.* (2020). The Blue Acceleration: The Trajectory of Human Expansion into the Ocean. **One Earth**, vol. 2, n. 1, p. 43. DOI: <https://doi.org/10.1016/j.oneear.2019.12.016>. Available at: <https://www.sciencedirect.com/science/article/pii/S2590332219302751>. Accessed on 13 March 2023.

Jouannet, E. (2005). *La Communauté Internationale vue par les Juristes*. **Annuaire Français de Relations Internationales (AFRI)**, vol. VI, p. 16-23. Centre Thucydide – Analyse et recherche en relations internationales (Université Paris II Panthéon-Assas). Available at: https://www.afri-ct.org/wp-content/uploads/2006/06/AFRI2005_jouannet.pdf. Accessed on 12 December 2021.

Jung, D. (2023). An International Legal Framework for Marine Plastics Pollution - Time for a Change to Regulate the Lifecycle of Plastics. In: **The Environmental Rule of Law for Oceans: Designing Legal Solutions**, F. Platjouw & A. Pozdnakova (Eds.), p. 46-57. Cambridge: Cambridge University Press. DOI:10.1017/9781009253741.008. Available at: <https://www.cambridge.org/core/books/environmental-rule-of-law-for-oceans/an-international-legal-framework-for-marine-plastics-pollution/297AD3C347FCBB475F36881EB558AE65>. Accessed on 17 January 2024.

Kajiwarra, N.; *et. al.* (2022). Recycling plastics containing decabromodiphenyl ether into new consumer products including children's toys purchased in Japan and seventeen other countries. **Chemosphere**, vol. 289. Available at: <https://www.sciencedirect.com/science/article/pii/S0045653521036511>. Accessed on 18 April 2023.

Kass, M.J. (2019). Fishing for Plastic: EU Targets Marine Pollution. **Natural Resources & Environment**, vol. 34, n. 1, p. 1. Available at: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3423433. Accessed on 17 January 2022.

Kedzierski, M.; *et. al.* (2020). Why is there plastic packaging in the natural environment? Understanding the roots of our individual plastic waste management behaviours. **Science of The Total Environment**, vol. 740, 139985. DOI: <https://doi.org/10.1016/j.scitotenv.2020.139985>. Available at: <https://www.sciencedirect.com/science/article/pii/S0048969720335051>. Accessed on 01 May 2023.

Keohane, R.O.; Victor, D.G. (2011). The Regime Complex for Climate Change. **Perspectives on Politics**, vol. 9, n. 1, p. 7-8. DOI: [doi:10.1017/S1537592710004068](https://doi.org/10.1017/S1537592710004068). Available at: <https://www.cambridge.org/core/journals/perspectives-on-politics/article/abs/regime-complex-for-climate-change/F5C4F620A4723D5DA5E0ACDC48D860C0>. Accessed on 13 March 2024.

Khan, S.A. (2016). E-products, E-waste and the Basel Convention: Regulatory Challenges and Impossibilities of International Environmental Law. **RECIEL - Review of European, Comparative & International Environmental Law**, vol. 25, n. 2, Special Issue: The Paris Agreement, p. 251-252. DOI: <https://doi.org/10.1111/reel.12163>. Available at: <https://onlinelibrary.wiley.com/doi/epdf/10.1111/reel.12163>. Accessed on 17 August 2022.

Khan, S.A. (2020). Clearly Hazardous, Obscurely Regulated: Lessons from the Basel Convention on Waste Trade. **American Journal of International Law Unbound**, vol. 114, p. 202. DOI: [10.1017/aju.2020.38](https://doi.org/10.1017/aju.2020.38). Available at: <https://www.cambridge.org/core/journals/american-journal-of-international-law/article/clearly-hazardous-obscurely-regulated-lessons-from-the-basel-convention-on-waste-trade/E250702AE51D72AC342AA811D3003579>. Accessed on 12 August 2023.

Kim, B.; *et. al.* (2023). Possibility analysis of complex marine accidents caused by large marine plastic litter in the Republic of Korea. **Marine Policy**, vol. 152, p. 1. DOI: <https://doi.org/10.1016/j.marpol.2023.105591>. Available at:

<https://www.sciencedirect.com/science/article/pii/S0308597X23001185>. Accessed on 20 August 2025.

Kim, R.E. (2016). The Nexus between International Law and the Sustainable Development Goals. **RECIEL** - Review of European, Comparative & International Environmental Law, vol. 25, n. 1, p. 16. DOI: <https://doi.org/10.1111/reel.12148>. Available at: <https://onlinelibrary.wiley.com/doi/epdf/10.1111/reel.12148>. Accessed on 17 April 2023.

Kim, S.W. (2023). Synergizing Climate Change and Ocean Regimes: A Comprehensive International Legal Approach for Ocean Acidification Governance. **Ocean and Polar Research**, vol. 45, n. 4, p. 192. Available at: <https://e-opr.org/articles/article/7R7d/>. Accessed on 12 June 2024.

Kirchherr, J.; *et. al.* (2017). Conceptualizing the circular economy: An analysis of 114 definitions. **Resources, Conservation and Recycling**, vol. 127, p. 222. DOI: <https://doi.org/10.1016/j.resconrec.2017.09.005>. Available at: <https://www.sciencedirect.com/science/article/pii/S0921344917302835>. Accessed on 19 September 2022.

Kirk, E.A.; Popattanachai, N. (2018). Marine plastics: Fragmentation, effectiveness and legitimacy in international lawmaking. **RECIEL**, vol. 27, n. 3 p. 223-224. DOI: <https://doi.org/10.1111/reel.12261>. Available at: <https://onlinelibrary.wiley.com/doi/abs/10.1111/reel.12261>. Accessed on 13 May 2023.

Kizilova, S. (2019). Form and functional features of modular floating structures. **Web of Conferences**, vol. 91, p. 3. DOI: <https://doi.org/10.1051/e3sconf/20199105013>. Available at: https://www.e3s-conferences.org/articles/e3sconf/abs/2019/17/e3sconf_tpacee2019_05013/e3sconf_tpacee2019_05013.html. Accessed on 12 January 2025.

Koivurova, T. (2013). Due Diligence. In: R. Wolfrum (ed.), *Max Planck Encyclopedias of International Law*, Oxford University Press, p. 4. Available at: <https://www.arcticcentre.org/loader.aspx?id=78182718-d0c9-4833-97b3-b69299e2f127>. Accessed on 12 June 2023.

Kojima, C. (2015). South China Sea Arbitration and the Protection of the Marine Environment: Evolution of UNCLOS Part XII Through Interpretation and the Duty to Cooperate. **Asian Yearbook of International Law**, vol. 21, p. 166-171. ISBN: 9789004344556. Publisher: Brill | Nijhoff. DOI: https://doi.org/10.1163/9789004344556_010. Available at: https://brill.com/display/book/edcoll/9789004344556/B9789004344556_010.xml. Accessed on 27 April 2022.

Krueger, J. (1998). Prior Informed Consent and the Basel Convention: The Hazards of What Isn't Known. **The Journal of Environment & Development**, vol. 7, n. 2, p. 130-131. DOI: <https://doi.org/10.1177/107049659800700203>. Available at : <https://journals.sagepub.com/doi/10.1177/107049659800700203?icid=int.sj-abstract.citing-articles.10>. Accessed on 11 August 2022.

Kukharchyk, T.; Příbylová, P.; Chernyuk, V. (2020). Polybrominated diphenyl ethers in plastic waste of electrical and electronic equipment: a case study in Belarus.

Environmental Science and Pollution Research, vol. 27, n. 25. DOI: 10.1007/s11356-020-09670-8. Available at: <https://pubmed.ncbi.nlm.nih.gov/32557023/>. Accessed on 18 April 2023.

Kumar, S.; Kumar, N.; Vivekadhish, S. (2016). Millennium Development Goals (MDGs) to Sustainable Development Goals (SDGs): Addressing Unfinished Agenda and Strengthening Sustainable Development and Partnership. **Indian Journal of Community Medicine**, vol. 41, n. 1, p. 2. Available at: <https://pmc.ncbi.nlm.nih.gov/articles/PMC4746946/pdf/IJCM-41-1.pdf>. Accessed on 16 May 2023.

Kumar, P.; *et al.* (2018). Determination of hierarchical relationships among sustainable development goals using interpretive structural modeling. **Environment, Development and Sustainability**, vol. 20, p. 2120. DOI: <https://doi.org/10.1007/s10668-017-9981-1>. Available at: <https://link.springer.com/article/10.1007/s10668-017-9981-1>. Accessed on 22 May 2023.

Kvale, K.; *et al.* (2024). Mind the fragmentation gap. **Nature Communications**, vol. 15, p. 1. DOI: <https://doi.org/10.1038/s41467-024-53962-3>. Available at: <https://www.nature.com/articles/s41467-024-53962-3>. Accessed on 12 January 2025.

Lebreton, L.C.M.; *et al.* (2017). River plastic emissions to the world's oceans. **Nature Communications**, vol. 8, p. 2. Available at: <https://www.nature.com/articles/ncomms15611>. Accessed on 15 October 2023.

Lebreton, L.; *et al.* (2018). Evidence that the Great Pacific Garbage Patch is rapidly accumulating plastic. **Scientific Reports**, vol. 8, p. 13. DOI: <https://doi.org/10.1038/s41598-018-22939-w>. Available at: <https://www.nature.com/articles/s41598-018-22939-w>. Accessed on 09 June 2022.

Lee, Y.; *et al.* (2023). Health Effects of Microplastic Exposures: Current Issues and Perspectives in South Korea. *Yonsei Medical Journal*, vol. 64, n. 5, p. 301–308. DOI: 10.3349/ymj.2023.0048. Available at: <https://pmc.ncbi.nlm.nih.gov/articles/PMC10151227/>. Accessed on 18 May 2023.

Leite, J.R.M.; Belchior, G.P.N. (2010). *O Estado de Direito Ambiental e a particularidade de uma hermenêutica jurídica*. **Revista Sequência**, vol. 31 n. 60, p. 291-318. UFSC, Florianópolis, SC, Brasil, ISSN 2177-7055. DOI:10.5007/2177-7055.2010v31n60p291. Available at: <https://periodicos.ufsc.br/index.php/sequencia/article/view/2177-7055.2010v31n60p291/15075>. Accessed on 20 December 2021.

Liu, Z.; *et al.* (2018). Are exports of recyclables from developed to developing countries waste pollution transfer or part of the global circular economy? **Resources, Conservation and Recycling**, vol. 136, p. 24. Available at <https://www.sciencedirect.com/science/article/abs/pii/S0921344918301368>. Accessed on 13 May 2023.

Lubchenco, J.; Gaines, S.D. (2019). A new narrative for the ocean. **Science**, vol. 364, n. 6444, p. 911. DOI: 10.1126/science.aay2241. Available at: <https://www.science.org/doi/10.1126/science.aay2241>. Accessed on 23 December 2021.

March, A.; *et. al.* (2024). National Action Plans: Effectiveness and requirements for the Global Plastics Treaty. **Cambridge Prisms: Plastics**, vol. 2, e11, p. 2. DOI: <https://doi.org/10.1017/plc.2024.11>. Available at: <https://www.cambridge.org/core/journals/cambridge-prisms-plastics/article/national-action-plans-effectiveness-and-requirements-for-the-global-plastics-treaty/E1948E36233B8E0BBB6CE1CCB80061C9>. Accessed on 19 November 2024.

Mauduit, J.C.; Soler, M.G. (2020). Building a Science Diplomacy Curriculum. **Frontiers in Education**, vol. 5, p. 2. Available at: <https://www.frontiersin.org/journals/education/articles/10.3389/feduc.2020.00138/full>. Accessed on 13 May 2024.

Maljean-Dubois, S.; Mayer, B. (2020). Liability and Compensation for Marine Plastic Pollution: Conceptual Issues and Possible Ways Forward. **AJIL Unbound**, vol. 114, p. 207. DOI:10.1017/aju.2020.40. Available at: <https://www.cambridge.org/core/journals/american-journal-of-international-law/article/liability-and-compensation-for-marine-plastic-pollution-conceptual-issues-and-possible-ways-forward/A84CB7AEBAC4E98E2DE98C3E1144A3F3>. Accessed on 17 May 2023.

Marcharla, E.; *et. al.* (2024). Microplastics in marine ecosystems: A comprehensive review of biological and ecological implications and its mitigation approach using nanotechnology for the sustainable environment. **Environmental Research**, vol. 256, p. 5. DOI: <https://doi.org/10.1016/j.envres.2024.119181>. Available at: <https://www.sciencedirect.com/science/article/pii/S0013935124010867>. Accessed on 12 January 2025.

Marel, E.R.V.D. (2022). Trading Plastic Waste in a Global Economy: Soundly Regulated by the Basel Convention? **Journal of Environmental Law**, vol. 34, n. 3. DOI: <https://doi.org/10.1093/jel/eqac017>. Available at: <https://academic.oup.com/jel/article/34/3/477/6713994>. Accessed on 13 May 2023.

Mcdowall, W.; *et. al.* (2017). Circular Economy Policies in China and Europe. **Journal of Industrial Ecology, Research and Analysis**, vol 21, n. 3, p. 652. Available at <https://onlinelibrary.wiley.com/doi/10.1111/jiec.12597>. Accessed on 22 May 2023.

McIlgorm, A.; *et. al.* (2020). Update of 2009 APEC report on Economic Costs of Marine Debris to APEC Economies. A report to the APEC Ocean and Fisheries Working Group by the Australian National Centre for Ocean Resources and Security (ANCORS), University of Wollongong, Australia. APEC Oceans and Fisheries Working Group, p. 8. Available at: https://www.apec.org/docs/default-source/Publications/2020/3/Update-of-2009-APEC-Report-on-Economic-Costs-of-Marine-Debris-to-APEC-Economies/220_OFWG_Update-of-2009-APEC-Report-on-Economic-Costs-of-Marine-Debris-to-APEC-Economies.pdf. Accessed on 21 April 2023.

McIlgorm, A.; *et. al.* (2022). The cost of marine litter damage to the global marine economy: Insights from the Asia-Pacific into prevention and the cost of inaction. **Marine Pollution Bulletin**, vol. 174, p. 2. DOI: <https://doi.org/10.1016/j.marpolbul.2021.113167>. Available at: <https://www.sciencedirect.com/science/article/pii/S0025326X21012017>. Accessed on 05 June 2022.

Meier-Wehren, B. (2013). The Global Programme of Action for the Protection of the Marine Environment from Land-based Activities. **New Zealand Journal of Environmental Law**, vol. 2, n. 17, p. 36-40. Available at: <https://www.nzlii.org/nz/journals/NZJLEnvLaw/2013/2.html>. Accessed on 12 December 2023.

Mikichurova, O.V.; Vialko, I.V. (2021) Circular law as a legal basis for a circular economy. IOP Conf. Series: **Earth and Environmental Science**, vol. 915, p. 1. DOI:10.1088/1755-1315/915/1/012022. Available at: <https://iopscience.iop.org/article/10.1088/1755-1315/915/1/012022>. Accessed on 11 September 2023.

Mollengarden, Z.; Zamir, N. (2021). The Monetary Gold Principle: Back to Basics. **American Journal of International Law**, vol. 115, n. 1, p. 41. DOI:10.1017/ajil.2020.86. Available at: <https://www.cambridge.org/core/services/aop-cambridge-core/content/view/B6691623A0AADEA48A8AD621B17B9987/S000293002000086Xa.pdf/the-monetary-gold-principle-back-to-basics.pdf>. Accessed on 17 June 2023.

Morath, S.J.; *et al.* (2021). Plastic Pollution Litigation. **Natural Resources & Environment**, vol. 36, n. 1, p. 41-44. Available at: <https://www.jstor.org/stable/27242800>. Accessed on 17 December 2024.

Nauke, M.; Holland, G.L. (1992). The Role and Development of Global Marine Conventions Two Case Histories. **Marine Pollution Bulletin**, vol. 25, n. 1-4, p. 74. DOI: [https://doi.org/10.1016/0025-326X\(92\)90190-H](https://doi.org/10.1016/0025-326X(92)90190-H). Available at: <https://www.sciencedirect.com/science/article/abs/pii/0025326X9290190H>. Accessed on 13 August 2022.

Ng, K.S.; Iacovidou, E. (2020). Malaysia Versus Waste. **The Chemical Engineer**, issue 949/50, p. 31. Available at: <https://www.thechemicalengineer.com/magazine/issues/issue-949950/>. Accessed on 19 August 2023.

Nguyen, L. N. (2017). The UNCLOS Dispute Settlement System: What Role Can It Play in Resolving Maritime Disputes in Asia? **Asian Journal of International Law**, vol. 8, n. 1, p. 20-21. DOI:10.1017/S204425131600031X. Available at: <https://www.cambridge.org/core/journals/asian-journal-of-international-law/article/abs/unclos-dispute-settlement-system-what-role-can-it-play-in-resolving-maritime-disputes-in-asia/A842AD7E3E49F1FA7E4E5CEE765E06FC>. Accessed on 17 April 2023.

Noskosk, L.E.C.; Gysi, E. (2024). Desafios climáticos e desastres naturais no Rio Grande do Sul: urgência de ações integradas e sustentáveis. **Fronteiras do conhecimento: um diálogo entre disciplinas**, vol. 1, n. 76. DOI: <https://doi.org/10.47879/ed.ep.2024486p41>. Available at: <https://portal.epitaya.com.br/index.php/ebooks/article/view/1082>. Accessed on 13 December 2024.

Osofsky, H.M. (2010). The Continuing Importance of Climate Change Litigation. **Washington & Lee Public Legal Studies Research Paper Series**, p. 1-45.

Available at: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1529669. Accessed on 13 December 2024.

Paglia, E. (2021). The Swedish initiative and the 1972 Stockholm Conference: the decisive role of science diplomacy in the emergence of global environmental governance. **Humanities and social sciences communications** (Springer Nature), vol. 8, n. 2, p. 1. DOI: <https://doi.org/10.1057/s41599-020-00681-x>. Available at: <https://www.nature.com/articles/s41599-020-00681-x>. Accessed on 08 April 2024.

Payne, J.; Jones, M.D. (2021). The Chemical Recycling of Polyesters for a Circular Plastics Economy: Challenges and Emerging Opportunities. **ChemSusChem** (Chemistry-Sustainability-Energy-Materials), vol. 14, n. 19, p. 4042. DOI: doi.org/10.1002/cssc.2021004004041. Available at: <https://chemistry-europe.onlinelibrary.wiley.com/doi/epdf/10.1002/cssc.202100400>. Accessed on 21 July 2023.

Polejack, A. (2021). The Importance of Ocean Science Diplomacy for Ocean Affairs, Global Sustainability, and the UN Decade of Ocean Science. **Frontiers in Marine Science**, vol. 8, p. 2. DOI: [10.3389/fmars.2021.664066](https://doi.org/10.3389/fmars.2021.664066). Available at: <https://www.frontiersin.org/journals/marine-science/articles/10.3389/fmars.2021.664066/full>. Accessed on 19 November 2022.

Popova, E.; *et al.* (2019). Ecological connectivity between the areas beyond national jurisdiction and coastal waters: Safeguarding interests of coastal communities in developing countries. **Marine Policy**, vol. 104, p. 90-102. Available at: <https://www.sciencedirect.com/science/article/pii/S0308597X19300764>. Accessed on 09 June 2024.

Prata, J.C.; *et al.* (2020). Covid-19 Pandemic Repercussions on the Use and Management of Plastics. **Environmental Science & Technology**, vol. 54, n. 13, p. 7761. DOI: <https://doi.org/10.1021/acs.est.0c02178>. Available at: <https://pubs.acs.org/doi/pdf/10.1021/acs.est.0c02178>. Accessed on 30 November 2021.

Prata, J.C.; *et al.* (2022). The road to sustainable use and waste management of plastics in Portugal. **Frontiers of Environmental Science & Engineering**, vol. 16, n. 5, p. 4. Available at: <https://doi.org/10.1007/s11783-021-1439-x>. Accessed on 20 December 2023.

Prieur, M. (2012). Non-regression in environmental law. **S.A.P.I.EN.S**, vol. 5, n. 2, p. 55. Available at: <http://journals.openedition.org/sapiens/1405>. Accessed on 11 March 2022.

Prieur, M. (2021). *L'émergence du principe de non régression ou l'illustration du rôle de la doctrine dans la création du droit de l'environnement*. **Rivista Quadrimestrale Di Diritto Dell'ambiente**, n. 2, p. 27. ISSN 2239-964X. Available at: https://www.rqda.eu/?dl_id=269. Accessed on 19 May 2022.

Priya, A.K.; *et al.* (2023). A study on managing plastic waste to tackle the worldwide plastic contamination and environmental remediation. **Chemosphere**, vol. 341, 139979, p. 5. DOI: <https://doi.org/10.1016/j.chemosphere.2023.139979>. Available at: <https://www.sciencedirect.com/science/article/pii/S0045653523022488?via%3Dihub>. Accessed on 19 January 2024.

Rabinovych, M. (2020). Legal Status and Effects of the Agenda 2030 Within the EU Legal Order. **Journal of Contemporary European Research**, vol. 16, n. 2, p. 190. DOI: <https://doi.org/10.30950/jcer.v16i2.1071>. Available at: <https://www.jcer.net/index.php/jcer/article/view/1071#:~:text=It%20is%20found%20that%2C%20despite,does%20not%20enjoy%20direct%20effect>. Accessed on 12 May 2023.

Raha, U.K.; *et. al.* (2021). Policy Framework for Mitigating Land-based Marine Plastic Pollution in the Gangetic Delta Region of Bay of Bengal- A review. **Journal of Cleaner Production**, vol. 278, p. 2. DOI: <https://doi.org/10.1016/j.jclepro.2020.123409>. Available at: https://www.sciencedirect.com/science/article/pii/S0959652620334545?ref=pdf_download&fr=RR-2&rr=90c34d8e0894ea3c. Accessed on 19 September 2024.

Râpă, M.; *et. al.* (2024). An Overview of the Current Trends in Marine Plastic Litter Management for a Sustainable Development. **Recycling**, vol. 9, n. 2, p. 1. DOI: <https://doi.org/10.3390/recycling9020030>. Available at: <https://www.mdpi.com/2313-4321/9/2/30>. Accessed on 12 November 2024.

Raubenheimer, K.; McIlgorm, A. (2017). Is the Montreal Protocol a model that can help solve the global marine plastic debris problem? **Marine Policy**, vol. 81, p. 323. Available at: <https://www.sciencedirect.com/science/article/pii/S0308597X16307096>. Accessed on 12 June 2023.

Raubenheimer, K.; McIlgorm, A. (2018). Can the Basel and Stockholm Conventions provide a global framework to reduce the impact of marine plastic litter? **Marine Policy**, vol. 96. DOI: <https://doi.org/10.1016/j.marpol.2018.01.013>. Available at: <https://www.sciencedirect.com/science/article/abs/pii/S0308597X17305146#:~:text=The%20Stockholm%20Convention%20and%20the%20Basel%20Convention%20can%20play%20a, and%20quantity%20of%20waste%20mismanaged>. Accessed on 03 September 2022.

Raubenheimer, K.; McIlgorm, A.; Oral, N. (2018). Towards an improved international framework to govern the life cycle of plastics. **RECIEL - Review of European, Comparative & International Environmental Law**, vol. 27, n. 3. Special Issue: Plastics Regulation. DOI: <https://doi.org/10.1111/reel.12267>. Available at: <https://onlinelibrary.wiley.com/doi/10.1111/reel.12267>. Accessed on 21 February 2023.

Rayner, R.; *et. al.* (2019). Ocean Observing and the Blue Economy. **Frontiers in Marine Science**, vol. 6, p. 2-4. DOI: <https://doi.org/10.3389/fmars.2019.00330> Available at: <https://www.frontiersin.org/journals/marine-science/articles/10.3389/fmars.2019.00330/full>. Accessed on 26 December 2021.

Richardson, K.; Hardesty, B.D.; Wilcox, C. (2019). Estimates of fishing gear loss rates at a global scale: A literature review and meta-analysis. **Fish and Fisheries**, vol. 20, n. 6, p. 1218. DOI: <https://doi.org/10.1111/faf.12407>. Available at: <https://onlinelibrary.wiley.com/doi/full/10.1111/faf.12407>. Accessed on 03 December 2023.

Rochman, C.M.; *et al.* (2013). Classify plastic waste as hazardous. **Nature**, vol. 494, p. 170. DOI: <https://doi.org/10.1038/494169a>. Available at: <https://www.nature.com/articles/494169a>. Accessed on 12 February 2022.

Royer, S.J.; *et al.* (2018). Production of methane and ethylene from plastic in the environment. **PLoS ONE**, vol. 13, n. 8. Available at: <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0200574>. Accessed on 23 March 2024.

Rudolph, T.B.; *et al.* (2020). A transition to sustainable ocean governance. **Nature Communications**, vol. 11, p. 7. DOI: <https://doi.org/10.1038/s41467-020-17410-2>. Available at: <https://www.nature.com/articles/s41467-020-17410-2>. Accessed on 09 June 2023.

Ruffini, P.B. (2019). *Diplomatie scientifique. De quelques notions de base et questions-clés*. **Philosophia Scientiæ**, vol. 23, n. 3, p. 67. Available at: <https://journals.openedition.org/philosophiascientiae/2064>. Accessed on 25 April 2024.

Salhofer, S.; *et al.* (2021). Plastic Recycling Practices in Vietnam and Related Hazards for Health and the Environment. **International Journal of Environmental Research and Public Health**, vol 18, p. 5. Available at: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8071425/pdf/ijerph-18-04203.pdf>. Accessed on 02 July 2023.

Schröder, P.; *et al.* (2019). Degrowth within – Aligning circular economy and strong sustainability narratives. **Resources, Conservation and Recycling**, vol. 146, p. 190-191. DOI: <https://doi.org/10.1016/j.resconrec.2019.03.038>. Available at: <https://www.sciencedirect.com/science/article/pii/S0921344919301429>. Accessed on 17 July 2023.

Seay, J.; Ternes, M.E. (2022). A review of current challenges and legal advances in the global management of plastic waste. **Clean Technologies and Environmental Policy**, vol. 24, no. 3, p. 731-738. Available at: <https://link.springer.com/article/10.1007/s10098-022-02289-y>. Accessed on 29 January 2022.

Seewoo, B.J.; *et al.* (2023). The plastic health map: A systematic evidence map of human health studies on plastic-associated chemicals. **Environment International**, vol. 181. DOI: <https://doi.org/10.1016/j.envint.2023.108225>. Available at: <https://www.sciencedirect.com/science/article/pii/S0160412023004981?via%3Dihub>. Accessed on 08 January 2024.

Serra-Gonçalves, C.; *et al.* (2023). Assessing the effectiveness of MARPOL Annex V at reducing marine debris on Australian beaches. **Marine Pollution Bulletin**, vol. 191, p. 1. Available at: <https://www.sciencedirect.com/science/article/pii/S0025326X23003600>. Accessed on 12 July 2023.

Servaes, J. (2017). Introduction: From MDGs to SDGs. In: **Sustainable Development Goals in the Asian Context**. Communication, Culture and Change in Asia, vol 2, p. 9. Servaes, J. (eds), Springer, Singapore. DOI: <https://doi.org/10.1007/978-981-10-2815->

1_1. Available at: https://link.springer.com/chapter/10.1007/978-981-10-2815-1_1. Accessed on 20 May 2023.

Seyyedi, S. R.; *et al.* (2023). Marine plastics, circular economy, and artificial intelligence: A comprehensive review of challenges, solutions, and policies. **Journal of Environmental Management**, vol. 345, 118591. DOI: <https://doi.org/10.1016/j.jenvman.2023.118591>. Available at: <https://www.sciencedirect.com/science/article/abs/pii/S0301479723013798?via%3Dihub>. Accessed on 12 November 2023.

Shelton, C.; *et al.* (2024). Disaster risk in Caribbean fisheries: How vulnerability is shaped and how it can be reduced in Dominica and Antigua and Barbuda, **Marine Policy**, vol. 160. Available at: <https://www.sciencedirect.com/science/article/pii/S0308597X23004840>. Accessed on 16 June 2024.

Shen, Maocai; *et al.* (2020). (Micro)plastic crisis: Un-ignorable contribution to global greenhouse gas emissions and climate change. **Journal of Cleaner Production**, vol. 254, p. 3. Available at: <https://www.sciencedirect.com/science/article/abs/pii/S0959652620301852>. Accessed on 23 March 2024.

Simon, N.; *et al.* (2021). A binding global agreement to address the life cycle of plastics - To eliminate plastic pollution, a holistic approach is needed. **Science**, vol. 373, n. 6550, p. 43-47. DOI: 10.1126/science.abi9010. Available at: <https://www.science.org/doi/full/10.1126/science.abi9010>. Accessed on 11 January 2022.

Singh, N.; Duan, H.; Tang, Y. (2020). Toxicity evaluation of E-waste plastics and potential repercussions for human health. **Environment International**, vol. 137, p. 2. DOI: <https://doi.org/10.1016/j.envint.2020.105559>. Available at: <https://www.sciencedirect.com/science/article/pii/S0160412019332556>. Accessed on 17 September 2023.

Skroback, A.E. (1994). Even a Sacred Cow Must Live in a Green Pasture: The Proximity Principle, Free Movement of Goods, and Regulation 259/93 on Transfrontier Waste Shipments Within the EC. **Boston College International and Comparative Law Review**, vol. 17, p. 87. Available at: <https://lira.bc.edu/work/sc/28766217-461c-4927-84aa-d8fc26ba67c5>. Accessed on 15 June 2023.

Soares, M. de O.; *et al.* (2020). Oil spill in South Atlantic (Brazil): Environmental and governmental disaster. **Marine Policy**, vol. 115, 103879, p. 1-7. DOI: <https://doi.org/10.1016/j.marpol.2020.103879>. Available at: <https://www.sciencedirect.com/science/article/pii/S0308597X19308346>. Accessed on 11 August 2025.

Soltani, N.S.; *et al.* (2022). International quantification of microplastics in indoor dust: prevalence, exposure and risk assessment. **Environmental Pollution**, vol. 312, 119957. DOI: <https://doi.org/10.1016/j.envpol.2022.119957>. Available at: <https://www.sciencedirect.com/science/article/pii/S026974912201171X?via%3Dihub>. Accessed on 18 September 2023.

- Springer, A.L. (1977). Towards a Meaningful Concept of Pollution in International Law. **The International and Comparative Law Quarterly**, vol. 26, n. 3, p. 532. Available at: <https://www.jstor.org/stable/758723?seq=2>. Accessed on 19 June 2023.
- Stegmann, P.; *et. al.* (2022). Plastic futures and their CO₂ emissions. **Nature**, vol. 612, p. 272-276. Available at: <https://www.nature.com/articles/s41586-022-05422-5>. Accessed on 20 March 2024.
- Stöfen-O'Brien, A. (2022). Current Legal Developments United Nations Environment Programme. **The International Journal of Marine and Coastal Law**, vol. 37, p. 727–740. Available at: https://brill.com/view/journals/estu/37/4/article-p727_5.xml. Accessed on 12 January 2023.
- Sun, S.; *et. al.* (2018). Tracking an Oil Tanker Collision and Spilled Oils in the East China Sea Using Multisensor Day and Night Satellite Imagery. **Geophysical Research Letters**, vol. 45, n. 7, p. 2883. DOI: <https://doi.org/10.1002/2018GL077433>. Available at: <https://agupubs.onlinelibrary.wiley.com/doi/full/10.1002/2018GL077433>. Accessed on 22 January 2022.
- Tabone, M.; *et. al.* (2010). Sustainability Metrics: Life Cycle Assessment and Green Design in Polymers. **Environmental Science & Technology**, vol 44, n. 21. DOI: 10.1021/es101640n. Available at: <https://pubs.acs.org/doi/10.1021/es101640n#>. Accessed on 11 January 2025.
- Tanaka, Y. (2023). Shared State Responsibility for Land-Based Marine Plastic Pollution. **Transnational Environmental Law**, vol. 12, n. 2, p. 244. DOI: [doi:10.1017/S2047102522000462](https://doi.org/10.1017/S2047102522000462). Available at: <https://www.cambridge.org/core/services/aop-cambridge-core/content/view/566C1933C7666C52DB045085BB51622D/S2047102522000462a.pdf/shared-state-responsibility-for-land-based-marine-plastic-pollution.pdf>. Accessed on 22 June 2023.
- Thompson, R.C.; *et. al.* (2024). Twenty years of microplastic pollution research—what have we learned? **Science**, vol. 386, n. 6720, p. 7. DOI: 10.1126/science.adl2746. Available at: <https://www.science.org/doi/10.1126/science.adl2746>. Accessed on 07 December 2024.
- Tiller, R.; Nyman, E. (2018). Ocean plastics and the BBNJ treaty - is plastic frightening enough to insert itself into the BBNJ treaty, or do we need to wait for a treaty of its own? **Journal of Environmental Studies and Sciences**, vol. 8, p. 411–415. Available at: <https://link.springer.com/article/10.1007/s13412-018-0495-4>. Accessed on 10 May 2023.
- Turekian, V. (2018). The Evolution of Science Diplomacy. **Global Policy**, vol. 9, p. 5-7. DOI: <https://doi.org/10.1111/1758-5899.12622>. Available at: <https://onlinelibrary.wiley.com/doi/10.1111/1758-5899.12622>. Accessed on 15 May 2024.
- Vanhala, L.; Hilson, C. (2013). Climate Change Litigation: Symposium Introduction. **Law & Policy** (University of Denver), vol. 35, n. 3, p. 141-149. DOI: <https://doi-org.ez11.periodicos.capes.gov.br/10.1111/lapo.12007>. Available at:

<https://onlinelibrary.wiley.com/doi/10.1111/lapo.12007>. Accessed on 22 December 2024.

Varvastian, S. (2023). The Role of Courts in Plastic Pollution Governance. **International & Comparative Law Quarterly**, vol. 72, n. 3, p. 14. DOI: 10.1017/S0020589323000179. Available at: <https://www.cambridge.org/core/services/aop-cambridge-core/content/view/9738157DDF3BE8304DD8FE7BBC8F56FE/S0020589323000179a.pdf/the-role-of-courts-in-plastic-pollution-governance.pdf>. Accessed on 19 December 2023.

Villarrubia-Gómez, P.; *et. al.* (2018). Marine plastic pollution as a planetary boundary threat - The drifting piece in the sustainability puzzle. **Marine Policy**, vol. 96, p. 213–220. Available at: <https://www.sciencedirect.com/science/article/pii/S0308597X17305456>. Accessed on 18 February 2022.

Voigt, C.; Ferreira, F. (2016). Differentiation in the Paris Agreement. **Climate Law**, vol. 6, n. 1–2, p. 66. DOI: <http://dx.doi.org/10.2139/ssrn.2827633>. Available at: <https://ssrn.com/abstract=2827633>. Accessed on 12 March 2023.

Vousdoukas, M.I.; *et. al.* (2023). Small Island Developing States under threat by rising seas even in a 1.5 °C warming world. **Nature Sustainability**, vol. 6, p. 1552–1564. Available at: <https://www.nature.com/articles/s41893-023-01230-5>. Accessed on 20 June 2024.

Walker, T.R. (2021). (Micro)plastics and the UN Sustainable Development Goals. **Current Opinion in Green and Sustainable Chemistry**, vol. 30, p. 1. DOI: <https://doi.org/10.1016/j.cogsc.2021.100497>. Available at: <https://www.sciencedirect.com/science/article/pii/S2452223621000535#:~:text=Goal%2014,.i.e.%20plastics%20%3C5%20mm>). Accessed on 03 November 2022.

Wang, G.; Lin, Y.; Shen, H. (2024). Exposure to Polystyrene Microplastics Promotes the Progression of Cognitive Impairment in Alzheimer's Disease: Association with Induction of Microglial Pyroptosis. **Molecular Neurobiology**, vol. 61, n. 2, p. 900. DOI: 10.1007/s12035-023-03625-z. Available at: <https://pubmed.ncbi.nlm.nih.gov/37670159/>. Accessed on 05 January 2025.

Wang, Y.; Pan, X. (2025). Application of the environmental impact assessment provisions under the BBNJ Agreement in high seas marine protected area: challenges and suggestion. **Frontiers in Marine Science**, vol. 12. DOI: <https://doi.org/10.3389/fmars.2025.1589936>. Available at: <https://www.frontiersin.org/journals/marine-science/articles/10.3389/fmars.2025.1589936/full>. Accessed on 16 August 2025.

Watson-Wright, W.M.; *et. al.* (2024). The UN Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection (GESAMP) — An ocean science-policy interface standing the test of time. **Marine Pollution Bulletin**, vol. 199, p. 1. DOI: <https://doi.org/10.1016/j.marpolbul.2023.115917>. Available at: <https://www.sciencedirect.com/science/article/pii/S0025326X23013528>. Accessed on 16 June 2024.

Weinhardt, C.; Petry, J. (2024). Contesting China's Developing Country Status: Geoeconomics and the Public–Private Divide in Global Economic Governance. **The Chinese Journal of International Politics**, vol. 17, n. 1., p. 71. DOI: <https://doi.org/10.1093/cjip/poae004>. Available at: <https://academic.oup.com/cjip/article/17/1/48/7623843>. Accessed on 13 May 2024.

Wen, Z.; *et. al.* (2021). China's plastic import ban increases prospects of environmental impact mitigation of plastic waste trade flow worldwide. **Nature Communications**, vol. 12, n. 425, p. 2. DOI: <https://doi.org/10.1038/s41467-020-20741-9>. Available at: <https://www.nature.com/articles/s41467-020-20741-9>. Accessed on 15 June 2023.

Williams, G.B.; *et. al.* (2023). Harnessing extremophilic carboxylesterases for applications in polyester depolymerisation and plastic waste recycling. **Essays in Biochemistry**, vol. 67, n. 4, p. 716. DOI: <https://doi.org/10.1042/EBC20220255>. Available at: <https://portlandpress.com/essaysbiochem/article/67/4/715/233154/Harnessing-extremophilic-carboxylesterases-for>. Accessed on 12 June 2024.

Yang, Y.; *et. al.* (2023). Detection of Various Microplastics in Patients Undergoing Cardiac Surgery. **Environmental Science & Technology**, vol. 57, n. 30, p. 10911-10918. Available at: <https://pubs.acs.org/doi/epdf/10.1021/acs.est.2c07179>. Accessed on 02 April 2024.

Zanella, T. V. (2013). *Poluição Marinha por Plásticos e o Direito Internacional do Meio Ambiente*. **Revista do Instituto de Direito Brasileiro**, nº 12, p. 14473-14500. ISSN: 2182-7567. Available at: https://www.cidp.pt/revistas/ridb/2013/12/2013_12_14473_14500.pdf. Accessed on 15 October 2023.

Zettler, E.R. ; *et. al.* (2013). Life in the “Plastisphere”: Microbial Communities on Plastic Marine Debris. **Environmental Science & Technology**, vol. 47, n. 13, 7137-7146. DOI: <https://doi.org/10.1021/es401288x>. Available at: <https://pubs.acs.org/doi/10.1021/es401288x>. Accessed on 17 January 2022.

Zhang, L.; Bai, E. (2023). The Regime Complexes for Global Climate Governance. **Sustainability**, vol. 15, no. 11, p. 4. DOI: <https://doi.org/10.3390/su15119077>. Available at: <https://www.mdpi.com/2071-1050/15/11/9077>. Accessed on 19 January 2024.

Zheng, J.; Suh, S. (2019). Strategies to reduce the global carbon footprint of plastics. **Nature Climate Change**, vol. 9, p. 377. Available at: <https://www.nature.com/articles/s41558-019-0459-z>. Accessed on 20 March 2024.

Zhou, J.; Luo, D. (2024). The global governance of marine plastic pollution: rethinking the extended producer responsibility system. **Frontiers in Marine Science**, vol. 11, p. 02. DOI: <https://doi.org/10.3389/fmars.2024.1363269>. Available at: <https://www.frontiersin.org/journals/marine-science/articles/10.3389/fmars.2024.1363269/full>. Accessed on 05 April 2024.

Zimmermann, L.; *et. al.* (2020). Are bioplastics and plant-based materials safer than conventional plastics? In vitro toxicity and chemical composition. **Environment International**, vol. 145. DOI: <https://doi.org/10.1016/j.envint.2020.106066>. Available

at: <https://www.sciencedirect.com/science/article/pii/S0160412020320213>. Accessed on 11 January 2025.

C) Electronic documents

Abram, N.; *et. al.* (2019). Framing and Context of the Report. In: IPCC Special Report on the Ocean and Cryosphere in a Changing Climate. Cambridge University Press, Cambridge, UK and New York, NY, USA, p. 92. Available at: https://www.ipcc.ch/site/assets/uploads/sites/3/2019/11/SROCC_FOD_Ch01_Final.pdf. Accessed on 20 September 2024.

Carswell, B.; McElwee, K.; Morison, S. (2011). **Technical Proceedings of the Fifth International Marine Debris Conference**. March 20–25, 2011. NOAA Technical Memorandum NOS-OR&R-38. Honolulu, Hawaii, USA. Available at: <https://marinedebris.noaa.gov/other-reports/technical-proceedings-fifth-international-marine-debris-conference>. Accessed on 14 December 2023.

CBD Secretariat (2000). **The Jakarta Mandate** – from global consensus to global work. Conservation and sustainable use of marine and coastal biological diversity. Available at: <https://www.cbd.int/doc/publications/jm-brochure-en.pdf>. Accessed on 28 March 2023.

CBD Secretariat (2020). **Aichi Biodiversity Targets**. Available at: <https://www.cbd.int/sp/targets>. Accessed on 29 May 2023.

Cheshire, A.C. ; *et. al.* (2009). UNEP/IOC Guidelines on Survey and Monitoring of Marine Litter. UNEP Regional Seas Reports and Studies, No. 186; IOC Technical Series No. 83: xii + 120 pp. Available at: <https://wedocs.unep.org/bitstream/handle/20.500.11822/13604/rsrs186.pdf?sequence=1&isAllowed=1>. Accessed on 15 February 2024.

China (2008). Circular Economy Promotion Law of the People's Republic of China. Available at <https://leap.unep.org/countries/cn/national-legislation/circular-economy-promotion-law-peoples-republic-china#:~:text=Circular%20Economy%20Promotion%20Law%20of%20the%20People's%20Republic%20of%20China,-Country&text=This%20Law%20is%20formulated%20for,environment%20and%20realizing%20sustainable%20development>. Accessed on 13 July 2023.

CMS Secretariat (1979). **Convention on the Conservation of Migratory Species of Wild Animals**. Adopted in Bonn, 23 June 1979. Entered into force on 1 November 1983. Available at: https://www.cms.int/sites/default/files/instrument/CMS-text.en_.PDF. Accessed on 18 November 2022.

Council of the European Union (2024a). Proposal for a Regulation of the European Parliament and of the Council on preventing plastic pellet losses to reduce microplastic pollution - General approach. Brussels, 11 December 2024 (OR. en) 16721/24. Interinstitutional File: 2023/0373(COD). Available at: <https://data.consilium.europa.eu/doc/document/ST-16721-2024-INIT/en/pdf>. Accessed on 17 January 2025.

COP 27 (2022). Sharm el-Sheikh Implementation Plan. Decision-/CP.27. Available at: https://unfccc.int/sites/default/files/resource/cop27_aup_2_cover%20decision.pdf. Accessed on 13 May 2024.

COP 28 (2023). Outcome of the first global stocktake. Draft decision -/CMA.5. Proposal by the President. FCCC/PA/CMA/2023/L.17. Available at: <https://unfccc.int/documents/636608>. Accessed on 02 April 2024.

Endocrine Society; IPEN (2020). **Plastics, EDCs & Health**: a guide for public interest organizations and policy-makers on endocrine disrupting chemicals & plastics. Available at: https://www.endocrine.org/-/media/endocrine/files/topics/edc_guide_2020_v1_6chqennew-version.pdf. Accessed on 11 June 2023.

Environmental Investigation Agency (2021). Ocean – The Truth Behind Trash: The scale and impact of the international trade in plastic waste, p. 7. Available at: <https://eia-international.org/wp-content/uploads/EIA-The-Truth-Behind-Trash-FINAL.pdf>. Accessed on 12 April 2023.

Environmental Investigation Agency (2024). Dirty Deals – Part Two. Evidencing illegalities in the global plastic waste trade, p. 24. Available at: <https://eia-international.org/report/dirty-deals-part-two/>. Accessed on 13 January 2025.

European Commission (2015). First circular economy action plan. Available at https://environment.ec.europa.eu/topics/circular-economy/first-circular-economy-action-plan_en. Accessed on 10 June 2023.

European Commission (2021b). Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on shipments of waste and amending Regulations (EU) No 1257/2013 and (EU) No 2020/1056. Available at: https://eur-lex.europa.eu/resource.html?uri=cellar:6c0588b1-4878-11ec-91ac-01aa75ed71a1.0001.02/DOC_1&format=PDF. Accessed on 26 December 2023.

European Commission (2025). Packaging waste. Available at: https://environment.ec.europa.eu/topics/waste-and-recycling/package-waste_en. Accessed on 16 February 2025.

European Council (2024). Available at: <https://www.consilium.europa.eu/en/press/press-releases/2024/12/16/sustainable-packaging-council-signs-off-on-new-rules-for-less-waste-and-more-re-use-in-the-eu/#:~:text=Today%2C%20the%20Council%20formally%20adopted,to%20minimise%20the%20packaging%20used..> Accessed on 19 December 2024.

European Union (2012). Consolidated version of the Treaty on the European Union. Official Journal of the European Union, C 326/13 - C 326/45, 26.10.2012. Available at: https://eur-lex.europa.eu/resource.html?uri=cellar:2bf140bf-a3f8-4ab2-b506-fd71826e6da6.0023.02/DOC_1&format=PDF. Accessed on 05 February 2024.

European Union (2015). Communication from the European Commission ‘Closing the loop – An EU action plan for the Circular Economy’. Available at: https://eur-lex.europa.eu/resource.html?uri=cellar:8a8ef5e8-99a0-11e5-b3b7-01aa75ed71a1.0012.02/DOC_1&format=PDF. Accessed on 18 May 2023.

European Union (2018). Communication from the European Commission ‘A European Strategy for Plastics in a Circular Economy’. Available at <https://eur->

lex.europa.eu/resource.html?uri=cellar:2df5d1d2-fac7-11e7-b8f5-01aa75ed71a1.0001.02/DOC_1&format=PDF. Accessed on 18 May 2023.

European Union (2019a). Communication from the European Commission ‘The European Green Deal’. Available at https://commission.europa.eu/publications/communication-european-green-deal_en. Accessed on 17 June 2023.

European Union (2019b). Directive (EU) 2019/904 of the European Parliament and of the Council of 5 June 2019 on the reduction of the impact of certain plastic products on the environment. Available at: <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32019L0904&qid=1694190120550>. Accessed on 23 May 2023.

European Union (2020). Communication from the European Commission ‘EUROPE 2020 A strategy for smart, sustainable and inclusive growth’. Available at: <https://ec.europa.eu/eu2020/pdf/COMPLET%20EN%20BARROSO%20%20%200007%20-%20Europe%202020%20-%20EN%20version.pdf>. Accessed on 15 May 2023.

European Union (2021a). Communication from the European Commission ‘on a new approach for a sustainable blue economy in the EU Transforming the EU’s Blue Economy for a Sustainable Future’. Available at <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52021DC0240>. Accessed on 20 June 2023.

European Union (2021b). Communication from the European Commission ‘Pathway to a Healthy Planet for All EU Action Plan: ‘Towards Zero Pollution for Air, Water and Soil’. Available at <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52021DC0400>. Accessed on 20 June 2023.

European Union (2025). REGULATION (EU) 2025/40 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 19 December 2024 on packaging and packaging waste, amending Regulation (EU) 2019/1020 and Directive (EU) 2019/904, and repealing Directive 94/62/EC. Official Journal of the European Union EN, L series, 22.1.2025. Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=OJ:L_202500040. Accessed on 16 February 2025.

FAO (1995). **Code of Conduct for Responsible Fisheries**. Available at: <https://openknowledge.fao.org/server/api/core/bitstreams/23312a48-cb99-4abf-b7e9-4f2f38604695/content>. Accessed on 17 April 2024.

FAO; UNEP (2023). **Rotterdam Convention on the prior informed consent procedure for certain hazardous chemicals and pesticides in International Trade**. Text and annexes. Revised in 2023. Available at: <https://www.pic.int/Portals/5/download.aspx?d=UNEP-FAO-RC-CONVTEXT-2023.English.pdf>. Accessed on 12 October 2024.

G20 (2017). **G20 Action Plan on Marine Litter**. Germany, Hamburg, 8p. Available at: <https://www.mofa.go.jp/mofaj/files/000272290.pdf>. Accessed on 18 September 2024.

G20 (2019). **G20 Implementation Framework for Actions on Marine Plastic Litter**. Osaka, Japan. Available at:

https://www.mofa.go.jp/policy/economy/g20_summit/osaka19/pdf/documents/en/annex_14.pdf. Accessed on 19 May 2023.

G20 Brasil (2024a). **Oceans20 Communiqué** –A Call to G20 Leadership. Driving Economic Prosperity, Climate Action, and Security through Ocean Stewardship, p. 7. Available at:

https://www.oceans20brasil.org/_files/ugd/0a78ab_642ed6e162d744d58ef92d5c0eb798ad.pdf. Accessed on 27 November 2024.

G20 Brasil (2024c). **G20 Rio de Janeiro Leaders' Declaration**. Available at:

<https://g20.org/wp-content/uploads/2024/11/G20-Rio-de-Janeiro-Leaders-Declaration-EN.pdf>. Accessed on 12 December 2024.

G7 (2018). **Ocean Plastics Charter**. Charlevoix, Canada. Available at:

https://www.consilium.europa.eu/media/40516/charlevoix_oceans_plastic_charter_en.pdf. Accessed on 12 June 2023.

GESAMP (1990). The State of the Marine Environment. Reports and Studies, N. 39.

IMO/FAO/Unesco/WMO/WHO/IAEA/UN/UNEP Joint Group of Experts on the Scientific Aspects of Marine Pollution (GESAMP). Available at:

<http://www.gesamp.org/site/assets/files/1216/the-state-of-the-marine-environment-en.pdf>. Accessed on 19 February 2024.

GESAMP (2019). **Guidelines on the monitoring and assessment of plastic litter and microplastics in the ocean** (Kershaw P.J., Turra A. and Galgani F. editors), (IMO/FAO/UNESCO-IOC/UNIDO/WMO/IAEA/UN/UNEP/UNDP/ISA Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection). Rep. Stud. GESAMP No. 99, 130p. Available at: <http://www.gesamp.org/publications/guidelines-for-the-monitoring-and-assessment-of-plastic-litter-in-the-ocean>. Accessed on 22 April 2023.

GESAMP (2021). Sea-based sources of marine litter. (Gilardi, K., ed.)

(IMO/FAO/UNESCO-IOC/UNIDO/ WMO/IAEA/UN/UNEP/UNDP/ISA Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection). Rep. Stud. GESAMP No. 108, p. 9. Available at:

<http://www.gesamp.org/site/assets/files/2213/rs108e.pdf>. Accessed on 15 April 2023.

GESAMP (2022). **Planning of GESAMP Activities: Sources, fate and effects of marine plastics and microplastics**. GESAMP 49/4/6, 22 Aug 2022, 49th session Agenda item 4 – Report of the co-Chairs of Working Group 40. Available at:

http://www.gesamp.org/site/assets/files/2240/49_4_6.pdf. Accessed on 17 November 2023.

Giskes, I.; *et al.* (2022). **Report on good practices to prevent and reduce marine plastic litter from fishing activities**. Rome and London, FAO and IMO. DOI:

<https://doi.org/10.4060/cb8665en>. Available at:

<https://openknowledge.fao.org/server/api/core/bitstreams/ddb38772-d471-48d1-84ae-0cf08119acb6/content>. Accessed on 17 March 2024.

Government of Canada (2024). Ocean Plastics Charter. Ambition – Aim and scope – Partners – How to endorse – Read the Ocean Plastics Charter. Available at:

<https://www.canada.ca/en/environment-climate-change/services/managing-reducing->

waste/international-commitments/ocean-plastics-charter.html. Accessed on 22 December 2024.

Hatje, V.; *et. al.* (2024). **Ocean Decade Vision 2030 White Papers** – Challenge 1: Understand and Beat Marine Pollution. Paris, UNESCO-IOC. (The Ocean Decade Series, 51.1), p. 22. DOI: <https://doi.org/10.25607/6m86-s908>. Available at: <https://unesdoc.unesco.org/ark:/48223/pf0000390116?posInSet=1&queryId=c41322a2-bc31-4ab5-bad5-b512d2806239>. Accessed on 13 September 2024.

ICJ (1954). *Affaire de L'Or Monétaire Pris a Rome en 1943 (Question Préliminaire) (Italie C. France, Royaume-Uni De Grande-Bretagne et D'Irlande Du Nord Et Etats-Unis D'Amerique)*. Judgment of 15 June 1954, Preliminary question, Procedure(s): Preliminary objections, Questions of jurisdiction and/or admissibility, p. 17. Available at: <https://www.icj-cij.org/sites/default/files/case-related/19/019-19540615-JUD-01-00-EN.pdf>. Accessed on 16 July 2023.

ICJ (1974). **Nuclear Tests (Australia v. France)**. Judgment of 20 December 1974 – Dissenting Opinion of Judge de Castro, p. 388-389. Available at: <https://www.icj-cij.org/public/files/case-related/58/058-19741220-JUD-01-08-EN.pdf>. Accessed on 23 January 2022.

ICJ (1996). Legality of the Threat or Use of Nuclear Weapons. Advisory Opinion, 8 July 1996, ICJ Reports, p. 242, paragraph 29. Available at: <https://www.icj-cij.org/sites/default/files/case-related/95/095-19960708-ADV-01-00-EN.pdf>. Accessed on 11 May 2023.

ICJ (2023). REQUEST FOR ADVISORY OPINION transmitted to the Court pursuant to General Assembly resolution 77/276 of 29 March 2023 OBLIGATIONS OF STATES IN RESPECT OF CLIMATE CHANGE. Available at: <https://www.icj-cij.org/sites/default/files/case-related/187/187-20230412-app-01-00-en.pdf>. Accessed on 07 August 2025.

ICJ (2025). OBLIGATIONS OF STATES IN RESPECT OF CLIMATE CHANGE. Advisory Opinion, 23 July 2025, p. 113. Available at: <https://www.icj-cij.org/sites/default/files/case-related/187/187-20250723-adv-01-00-en.pdf>. Accessed on 17 August 2025.

IMO (1972). **Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter**. Entry into force on 30 August 1975. Available at: <https://wwwcdn.imo.org/localresources/en/OurWork/Environment/Documents/LC1972.pdf>. Accessed on 15 May 2022.

IMO (2006). 1996 Protocol to the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, 1972 (as amended in 2006). Available at: <https://wwwcdn.imo.org/localresources/en/OurWork/Environment/Documents/PROTOCOLAmended2006.pdf>. Accessed on 17 September 2024.

IMO (2013). Simplified overview of the discharge provisions of the revised MARPOL Annex V which entered into force on 1 January 2013. Available at: <https://wwwcdn.imo.org/localresources/en/OurWork/Environment/Documents/Annex%20V%20discharge%20requirements%2007-2013.pdf>. Accessed on 16 November 2024.

IMO (2017a). Annex 5 – Revised 2017 Compliance Procedures and Mechanisms. Revised 2017 Compliance Procedures and Mechanisms Pursuant to Article 11 of the 1996 Protocol to the London Convention 1972 (adopted in 2007: LC 29/17, annex 7). Available at:
<https://wwwcdn.imo.org/localresources/en/OurWork/Environment/Documents/Revised%202017%20CPM.pdf>. Accessed on 13 February 2023.

IMO (2017b). Annex 21 – Resolution MEPC.295(71) (Adopted on 7 July 2017). 2017 Guidelines for the implementation of MARPOL Annex V (MEPC 71/17/Add.1). Available at:
[https://wwwcdn.imo.org/localresources/en/OurWork/Environment/Documents/MEPC.295\(71\).pdf](https://wwwcdn.imo.org/localresources/en/OurWork/Environment/Documents/MEPC.295(71).pdf). Accessed on 13 March 2022.

IMO (2018a). Action Plan to address marine plastic litter from ships. Annex 10 – Resolution MEPC.310(73) (adopted on 26 October 2018). Available at:
<https://wwwcdn.imo.org/localresources/en/MediaCentre/HotTopics/Documents/IMO%20marine%20litter%20action%20plan%20MEPC%2073-19-Add-1.pdf>. Accessed on 15 August 2024.

IMO (2018b). Simplified overview of the discharge provisions of the revised MARPOL Annex V which entered into force on 1 March 2018. Available at:
<https://wwwcdn.imo.org/localresources/en/OurWork/Environment/Documents/Simplified%20overview%20of%20the%20discharge%20provisions%20of%20the%20revised%20MARPOL%20Annex%20V.pdf>. Accessed on 12 November 2022.

IMO (2021). Strategy to Address Marine Plastic Litter from Ships. Annex 2 – Resolution MEPC.341(77) (adopted on 26 November 2021). Available at:
<https://wwwcdn.imo.org/localresources/en/MediaCentre/HotTopics/Documents/marine%20litter/STRATEGY%20TO%20ADDRESS%20MARINE%20PLASTIC%20LITTER%20FROM%20SHIPS.pdf>. Accessed on 15 August 2024.

IMO (2022). Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter. Home – Our Work – Marine Environment. Available at:
<https://www.imo.org/en/OurWork/Environment/Pages/London-Convention-Protocol.aspx>. Accessed on 17 November 2024.

IMO (2024a). 46th Consultative Meeting of Contracting Parties to the London Convention and the 19th Meeting of Contracting Parties to the London Protocol (LC 46/LP 19). Home – Media Centre – Meeting Summaries. Available at:
<https://www.imo.org/en/MediaCentre/MeetingSummaries/Pages/LC-46-LP-19.aspx>. Accessed on 17 November 2024.

IMO (2024b). Statement by the International Maritime Organization (IMO) at INC-5. Available at:
https://resolutions.unep.org/incres/uploads/statement_by_the_international_maritime_organization_inc-5.pdf. Accessed on 08 December 2024.

IMO (2024e). Recommendations for the Carriage of Plastic Pellets by Sea in Freight Containers (MEPC.1/Circ.909). Available at:
<https://wwwcdn.imo.org/localresources/en/MediaCentre/HotTopics/Documents/MEPC.1-Circ.909.pdf>. Accessed on 25 May 2024.

IMO Rules (2024). Regulation 10 - Placards, garbage management plans, and garbage record-keeping. MARPOL Annex V. Available at: <https://www.imorules.com/GUID-8B16B4C8-D055-4ED1-B7EB-52B4C507EF3E.html>. Accessed on 19 December 2024.

IOC-UNESCO (2020a). **The Science we need for the ocean we want: the United Nations Decade of Ocean Science for Sustainable Development (2021-2030)**. Available at: <https://unesdoc.unesco.org/ark:/48223/pf0000265198>. Accessed on 13 March 2022.

IOC-UNESCO (2020b). **Global Ocean Science Report 2020 – Charting Capacity for Ocean Sustainability**. K. Isensee (ed.), Paris, UNESCO Publishing, p. 182. Available at: <https://unesdoc.unesco.org/ark:/48223/pf0000375147>. Accessed on 22 June 2022.

IOC-UNESCO (2021). The United Nations Decade of Ocean Science for Sustainable Development (2021-2030) Implementation Plan. UNESCO, Paris (IOC Ocean Decade Series, 20.), p. 4. Available at: <https://unesdoc.unesco.org/ark:/48223/pf0000377082>. Accessed on 17 March 2022.

IOC-UNESCO (2024). 2024 Ocean Decade Conference. Available at: <https://oceandecade.org/events/2024-ocean-decade-conference/>. Accessed on 17 November 2024.

IOC-UNESCO (2025). Ocean Decade Progress Report 2023-2024. UNESCO, Paris. (The Ocean Decade Series, 53), p. 11. Available at: <https://unesdoc.unesco.org/ark:/48223/pf0000392445>. Accessed on 29 January 2025.

IRP (2021). Policy options to eliminate additional marine plastic litter by 2050 under the G20 Osaka Blue Ocean Vision. Fletcher, S., Roberts, K.P., Shiran, Y., Virdin, J., Brown, C., Buzzi, E., Alcolea, I.C., Henderson, L., Laubinger, F., Milà i Canals, L., Salam, S., Schmuck, S.A., Veiga, J.M., Winton, S., Youngblood, K.M. Report of the International Resource Panel. United Nations Environment Programme. Nairobi, Kenya. Available at: https://www.resourcepanel.org/sites/default/files/documents/document/media/policy_options_to_eliminate_additional_marine_plastic_litter.pdf. Accessed on 15 May 2023.

ISO (2023). How standards address plastic pollution. Issue brief, p. 3. Available at: <https://www.iso.org/files/live/sites/isoorg/files/store/en/PUB100473.pdf>. Accessed on 27 May 2024.

ITLOS (2011). **Responsibilities and obligations of States sponsoring persons and entities with respect to activities in the Area**. Request for Advisory Opinion submitted to the Seabed Disputes Chamber - List of cases: No. 17, paragraph. 110. Available at: https://www.itlos.org/fileadmin/itlos/documents/cases/case_no_17/17_adv_op_010211_en.pdf. Accessed on 22 September 2023.

Koh, Tommy T.B. (1982). **A Constitution for the Oceans**. Remarks by the President of the Third United Nations Conference on the Law of the Sea (Dec. 6 & 11, 1982), 5p. Available at: https://www.un.org/depts/los/convention_agreements/texts/koh_english.pdf. Accessed on 18 December 2021.

Lyons, Y.; *et. al.* (2020) **Status of Research, Legal and Policy Efforts on Marine Plastics in ASEAN+3: A Gap Analysis at the Interface of Science, Law and Policy.** COBSEA and NUS, p. 70. Available at: <https://wedocs.unep.org/bitstream/handle/20.500.11822/33383/NUS.pdf?sequence=1&isAllowed=y%C3%B9>. Accessed on 12 September 2023.

NOAA (1985). Proceedings of the Workshop on the Fate and Impact of Marine Debris, 27-29 November 1984, Honolulu, Hawaii. Shomura, Richard S.; Yoshida, Howard O. (Editors). Available at: <https://repository.library.noaa.gov/view/noaa/5680>. Accessed on 19 September 2023.

NOAA (1990). Proceedings of the Second International Conference on Marine Debris, 2-7 April 1989, Honolulu, Hawaii. Shomura, Richard S. ; Godfrey, Mary Lynne (Editors). Available at: <https://repository.library.noaa.gov/view/noaa/6012>. Accessed on 16 September 2023.

NOAA; UNEP (2012). **The Honolulu Strategy** – A Global Framework for Prevention and Management of Marine Debris, p. ES-1. Available at: <https://wedocs.unep.org/bitstream/handle/20.500.11822/10670/Honolulu%20strategy.pdf?sequence=1&isAllowed=y>. Accessed on 13 February 2024.

OECD (2018). **Improving Markets for Recycled Plastics** – Trends, Prospects and Policy Responses. Available at: https://www.oecd.org/en/publications/improving-markets-for-recycled-plastics_9789264301016-en.html. Accessed on 18 September 2024.

OECD (2022a). **Global Plastics Outlook: Policy Scenarios to 2060.** OECD Publishing, Paris, p. 22. DOI: <https://doi.org/10.1787/aa1edf33-en>. Available at: https://www.oecd.org/en/publications/global-plastics-outlook_aa1edf33-en/full-report.html. Accessed on 02 June 2022.

OSPAR Commission (1992). The OSPAR Convention for the Protection of the Marine Environment of the North-East Atlantic. Available at: https://www.ospar.org/site/assets/files/1169/ospar_convention.pdf. Accessed on 04 October 2024.

PCA (2015). **The Chagos Marine Protected Area Arbitration** (The Republic of Mauritius and the United Kingdom of Great Britain and Northern Ireland). Award of the Arbitral Tribunal constituted under Annex VII of the United Nations Convention on the Law of the Sea, of 18 March 2015. Available at: <https://files.pca-cpa.org/pcadocs/MU-UK%2020150318%20Award.pdf>. Accessed on 16 July 2024.

PCA (2016). **The South China Sea Arbitration.** Award of 12 July 2016. PCA Case N° 2013-19 in the matter of the South China Sea arbitration - before - an Arbitral Tribunal constituted under Annex VII to the 1982 United Nations Convention on the Law of the Sea - between - the Republic of the Philippines - and - the People's Republic of China. Arbitral Tribunal: Judge Thomas A. Mensah (Presiding Arbitrator) Judge Jean-Pierre Cot Judge Stanislaw Pawlak Professor Alfred H.A. Soons Judge Rüdiger Wolfrum. Available at: <https://pcacases.com/web/sendAttach/2086>. Accessed on 29 April 2022.

Planetary Boundaries Science (2025). Planetary Health Check 2025 – A Scientific Assessment of the State of the Planet. Potsdam Institute for Climate Impact Research

(PIK), Potsdam, Germany. DOI: 10.48485/pik.2025.017. Available at: <https://www.planetaryhealthcheck.org/wp-content/uploads/PlanetaryHealthCheck2025.pdf>. Accessed on 03 October 2025.

Potts, T.; Hastings, E. (2011). *Marine Litter Issues, Impacts and Actions*. Published by the Scottish Government. ISBN: 978-1-78256-082-1, p. 25. Available at: <https://www.gov.scot/binaries/content/documents/govscot/publications/impact-assessment/2012/09/marine-litter-issues-impacts-actions/documents/00402421-pdf/00402421-pdf/govscot%3Adocument/00402421.pdf>. Accessed on 19 February 2024.

Ritter, L.; Solomon, K.R.; Forget, J. (2001). **Persistent Organic Pollutants** - An Assessment Report on: DDT-Aldrin-Dieldrin-Endrin-Chlordane Heptachlor-Hexachlorobenzene Mirex-Toxaphene Polychlorinated Biphenyls Dioxins and Furans, p. 7. Available at: https://chm.pops.int/Portals/0/docs/from_old_website/documents/background/assessreport/en/ritteren.pdf. Accessed on 14 May 2022.

Sachs, J.D.; Lafortune, G.; Fuller, G. (2024). **Sustainable Development Report 2024: The SDGs and the UN Summit of the Future**. Published by Dublin University Press Dublin, Ireland, p. 15. DOI: 10.25546/108572. Available at: <https://s3.amazonaws.com/sustainabledevelopment.report/2024/sustainable-development-report-2024.pdf>. Accessed on 11 May 2023.

SBC (2019). Fourteenth Meeting of the Conference of the Parties to the Basel Convention Geneva, Switzerland, from 29 April to 10 May 2019 – UNEP/CHW.14/28. Available at: <http://www.basel.int/TheConvention/ConferenceoftheParties/Meetings/COP14/tabid/7520/Default.aspx>. Accessed on 17 November 2024.

SBC (2023). **Basel Convention on the control of Transboundary Movements of Hazardous Wastes and their Disposal**. Texts and Annexes revised in 2023. Available at: <https://www.basel.int/Portals/4/download.aspx?d=UNEP-CHW-IMPL-CONVTEXT-2023.English.pdf>. Accessed on 17 July 2024.

Secretariat of the Rotterdam Convention (2019). RC-9/9: International cooperation and coordination. Available at: <https://www.pic.int/TheConvention/ConferenceoftheParties/Meetings/COP9/Overview/tabid/7528/language/en-%20US/Default.aspx>. Accessed on 15 September 2023.

Superior Court of California (2024a). *People v. PepsiCo, Inc., et. al.* Complaint, No. 24STCV28450 (Cal. Super. Ct. Oct. 30, 2024). Available at: https://climatecasechart.com/wp-content/uploads/case-documents/2024/20241030_docket-24STCV28450_complaint.pdf. Accessed on 09 December 2024.

Superior Court of California (2024b). *The People of the State of California, ex Rel. Rob Bonta, Attorney General of California (Plaintiff), v. Exxon Mobil Corporation; and does 1 through 100, inclusive (Defendants)*. Available at: https://oag.ca.gov/system/files/attachments/press-docs/Complaint_People%20v.%20Exxon%20Mobil%20et%20al.pdf. Accessed on 13 December 2024.

Systemiq; Handelens Miljøfond; Mepex (2023). **Achieving Circularity** – Synthesis Report – a low-emissions circular plastic economy in Norway. Available at: https://www.systemiq.earth/reports/downloads/Systemiq_Achieving_Circularity_Synthesis_Report.pdf. Accessed on 17 February 2024.

The Bahamas Maritime Authority (2022). MARPOL Annex V. Marine Notice 60. Available at: <https://www.bahamasmaritime.com/wp-content/uploads/2022/03/MN060-MARPOL-Annex-V-v1.0.pdf>. Accessed on 13 October 2024.

UN (1945). Charter of the United Nations. San Francisco, 26 June 1945. Entry into force on 24 October 1945. Available at: <https://www.un.org/en/about-us/un-charter/full-text>. Accessed on 12 February 2022.

UN (1972a). **Report of the United Nations Conference on the Human Environment**. Chapter II. Action Plan for the Human Environment – “A. Framework for environmental action”. Available at: <https://documents.un.org/doc/undoc/gen/nl7/300/05/pdf/nl730005.pdf>. Accessed on 17 August 2024.

UN (1973). **Declaration of the United Nations Conference on the Human Environment**. Report of the United Nations Conference on the Human Environment, Stockholm, 5-16 June 1972 Available at: <https://documents.un.org/doc/undoc/gen/nl7/300/05/pdf/nl730005.pdf>. Accessed on 22 September 2023.

UN (1982a). **United Nations Convention on the Law of the Sea**. Montego Bay, December 10th, 1982. Entry into force on 16 November 1994. Available at: https://www.un.org/depts/los/convention_agreements/texts/unclos/unclos_e.pdf. Accessed on 23 January 2022.

UN (1982b). **Statute of the International Law Commission** (UN Doc. A/CN.4/4/Rev.2). United Nations, New York. Available at: <https://documents.un.org/doc/undoc/gen/g03/808/67/img/g0380867.pdf>. Accessed on 17 October 2023.

UN (1989). **Montreal Protocol on Substances that Deplete the Ozone Layer**. Concluded at Montreal on 16 September 1987. Available at: <https://treaties.un.org/doc/publication/unts/volume%201522/volume-1522-i-26369-english.pdf>. Accessed on 14 April 2023.

UN (1992a). **Agenda 21**. United Nations Conference on Environment & Development Rio de Janeiro, Brazil, 3 to 14 June 1992. Available at: <https://sustainabledevelopment.un.org/content/documents/Agenda21.pdf>. Accessed on 15 January 2022.

UN (2005a). **Vienna Convention on the Law of Treaties**. Done at Vienna on 23 May 1969. Entered into force on 27 January 1980. United Nations, Treaty Series, vol. 1155, p. 331. Available at: https://legal.un.org/ilc/texts/instruments/english/conventions/1_1_1969.pdf. Accessed on 18 December 2021.

UN (2005b). Draft articles on the law of the non-navigational uses of international watercourses and commentaries thereto and resolution on transboundary confined groundwater, 1994. Report of the International Law Commission on the work of its forty-sixth session, p. 124. Available at: https://legal.un.org/ilc/texts/instruments/english/commentaries/8_3_1994.pdf. Accessed on 12 May 2024.

UN (2006). **Trail smelter case (United States, Canada)**. Reports of International Arbitral Awards, 16 April 1938 and 11 March 1941. Vol. III, p. 1963. Available at: https://legal.un.org/riaa/cases/vol_iii/1905-1982.pdf. Accessed on 22 September 2023.

UN (2009). **Third United Nations Conference on the Law of the Sea (1973–1982)**. Sixth Session (New York, 23 May to 15 July 1977), Volume VIII: Informal Composite Negotiating Text (https://legal.un.org/diplomaticconferences/1973_los/vol8.shtml) - Third United Nations Conference on the Law of the Sea, 1973-82 (A/CONF.62/WP.10/Rev.1). Available at: https://legal.un.org/diplomaticconferences/1973_los/docs/english/vol_8/a_conf62_wp10_rev1.pdf. Accessed on 16 November 2023.

UN (2012). The Future We Want. Outcome document of the United Nations Conference on Sustainable Development Rio de Janeiro, Brazil, 20–22 June 2012. Available at: <https://sustainabledevelopment.un.org/content/documents/733FutureWeWant.pdf>. Accessed on 2 April 2023.

UN (2014). **Convention on the Law of the Non-navigational Uses of International Watercourses**. Adopted by the General Assembly of the United Nations on 21 May 1997. Entered into force on 17 August 2014. See General Assembly resolution 51/229, annex, Official Records of the General Assembly, Fifty-first Session, Supplement No. 49 (A/51/49). Available at: https://legal.un.org/ilc/texts/instruments/english/conventions/8_3_1997.pdf. Accessed on 17 August 2024.

UN (2017a). Report of the United Nations Conference to Support the Implementation of Sustainable Development Goal 14: Conserve and sustainably use the oceans, seas and marine resources for sustainable development (A/CONF.230/14). Available at: <https://digitallibrary.un.org/record/1301296?v=pdf>. Accessed on 13 January 2023.

UN (2018). 2. Global Programme of Action for the Protection of the Marine Environment from Land-based Activities. In: Book - Unit 5 - Land-Based Sources of Marine Pollution. Available at: <https://globalpact.informea.org/sites/default/files/documents/Book%20-%20Unit%205%20-%20Land-Based%20Sources%20of%20Marine%20Pollution.pdf>. Accessed on 17 January 2024.

UN (2019). The United Nations Fish Stocks Agreement. Division for Ocean Affairs and the Law of the Sea - UNFSA Overview (the United Nations Agreement for the Implementation of the Provisions of the UNCLOS relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks). Available at: <https://www.un.org/oceancapacity/unfsa>. Accessed on 3 August 2024.

UN (2022b). Report of the 2022 United Nations Conference to Support the Implementation of Sustainable Development Goal 14: Conserve and sustainably use the oceans, seas and marine resources for sustainable development (A/CONF.230/2022/14). Available at: <https://documents.un.org/doc/undoc/gen/n22/454/51/pdf/n2245451.pdf>. Accessed on 17 November 2023.

UN (2023a). Agreement under the United Nations Convention on the Law of the Sea on the Conservation and Sustainable Use of Marine Biological Diversity of Areas Beyond National Jurisdiction. Adopted on 19 June 2023. Available at: <https://www.un.org/bbnjagreement/en/bbnj-agreement/text-bbnj-agreement>. Accessed on 13 August 2024.

UN (2024). The Sustainable Development Goals Report. United Nations publication issued by the Department of Economic and Social Affairs (DESA), p. 36. ISBN 978-92-1-003135-6. Available at: <https://unstats.un.org/sdgs/report/2024/The-Sustainable-Development-Goals-Report-2024.pdf>. Accessed on 05 January 2025.

UN (1972b). **Declaration of the United Nations Conference on the Human Environment**. Stockholm, 5 to 16 June 1972. Available at: https://www.ipcc.ch/apps/njlite/srex/njlite_download.php?id=6471. Accessed on 02 April 2023.

UN (1992b). **United Nations Framework Convention on Climate Change**. Adopted in New York on 9 May 1992. Entry into force on 21 March 1994. Available at: https://unfccc.int/files/essential_background/background_publications_htmlpdf/application/pdf/conveng.pdf. Accessed on 11 June 2023.

UN (1994a). Global Conference on the Sustainable Development of Small Island Developing States, 26 April-6 May 1994, Bridgetown, Barbados. Available at: https://www.un.org/esa/dsd/dsd_aofw_sids/sids_pdfs/BPOA.pdf. Accessed on 26 June 2024.

UN (1994b). Report of the Global Conference on the Sustainable Development of Small Island Developing States Bridgetown, Barbados, 26 April-6 May 1994. Available at: https://digitallibrary.un.org/record/198168/files/A_CONF.167_9-EN.pdf?ln=en. Accessed on 26 June 2024.

UN (1996). Organizational Matters Adoption of The Rules of Procedure (FCCC/CP/1996/2). Framework Convention on Climate Change, Conference of the Parties, Second Session Geneva, 8 - 19 July 1996 - Item 4 (b) of the provisional agenda. Available at: <https://documents-dds-ny.un.org/doc/UNDOC/GEN/G96/617/99/PDF/G9661799.pdf?OpenElement>. Accessed on 12 June 2023.

UN (1998). **Kyoto Protocol to the United Nations Framework Convention on Climate Change**. Adopted on 11 December 1997. Entry into force on 16 February 2005. Available at: <https://unfccc.int/resource/docs/convkp/kpeng.pdf>. Accessed on 15 December 2023.

UN (2015c). **Paris Agreement**. Adopted on 12 December 2015. Entry into force on 4 November 2016. Available at:

https://unfccc.int/sites/default/files/english_paris_agreement.pdf. Accessed on 07 November 2023.

UN (2015d). Goal 12 – Ensure sustainable consumption and production patterns. Available at: https://sdgs.un.org/goals/goal12#targets_and_indicators. Accessed on 09 May 2023.

UN (2020). Report of the Global Environment Facility to the Conference of the Parties. Framework Convention on Climate Change, FCCC/CP/2020/1, 23 October 2020, p. 83. Available at: https://unfccc.int/sites/default/files/resource/cp2020_01S.pdf. Accessed on 27 May 2024.

UN (2021). How is climate change impacting the world's ocean. United Nations, Climate Action. Available at: <https://www.un.org/en/climatechange/science/climate-issues/ocean-impacts>. Accessed on 19 September 2024.

UN (2022a). UN Secretary-General declares an “Ocean Emergency”. Available at: <https://unric.org/en/un-secretary-general-declares-an-ocean-emergency/>. Accessed on 29 June 2022.

UN (2023b). Paris Agreement – Procedural History. Audiovisual Library of International Law, Codification Division, Office of Legal Affairs, 2023. Available at: <https://legal.un.org/avl/ha/pa/pa.html>. Accessed on 12 June 2023.

UN (2023c). Final report a toolkit for monitoring and reporting on the SAMOA Pathway. Available at: https://www.un.org/ohrrls/sites/www.un.org.ohrrls/files/files/finalreport_sp_160123.pdf. Accessed on 17 June 2024.

UN (2025b). Our ocean, our future: united for urgent action. Draft resolution submitted by the Presidents of the Conference (Costa Rica and France) (A/CONF.230/2025/L.1), p. 4. Available at: <https://docs.un.org/en/A/CONF.230/2025/L.1>. Accessed on 07 August 2025.

UN Treaty Collection (1987). **Montreal Protocol on Substances that Deplete the Ozone Layer** (with annex). Concluded at Montreal on 16 September 1987. Entry into force on 1 January 1989. Available at: <https://treaties.un.org/doc/publication/unts/volume%201522/volume-1522-i-26369-english.pdf>. Accessed on 16 December 2023.

UNCTAD (2003). Science and Technology Diplomacy: Concepts and Elements of a Work Programme. United Nations, New York and Geneva, p. 3. Available at: https://unctad.org/system/files/official-document/itetebmisc5_en.pdf. Accessed on 10 May 2024.

UNCED (2022). Agenda 21 – UN Sustainable Development Goals Knowledge Platform. Available at: <https://sustainabledevelopment.un.org/outcomedocuments/agenda21>. Accessed on 12 October 2023.

UNCTAD (2021). The Bridgetown Covenant. From inequality and vulnerability to prosperity for all (TD/L.435). Fifteenth session Virtual Barbados 3–7 October 2021

Item 8 of the agenda (TD/L.435). Available at: https://unctad.org/system/files/official-document/td-l-435_en.pdf. Accessed on 18 September 2024.

UNEA (2014). Ministerial Outcome Document of the First Session of the United Nations Environment Assembly of the United Nations Environment Programme. Available at: https://www.bmu.de/fileadmin/Daten_BMU/Download_PDF/Europa___International/unea_ministerial_outcome_document_en_bf.pdf. Accessed on 12 May 2023.

UNECE (2014). **Convention on the Protection and Use of Transboundary Watercourses and International Lakes** – as amended, along with decision VI/3 clarifying the accession procedure. Opened for signature in Helsinki on 17 March 1992. Entry into force on 6 October 1996. Available at: https://unece.org/DAM/env/water/publications/WAT_Text/ECE_MP.WAT_41.pdf. Accessed on 15 June 2023.

UNEA (2022a). **5/14. End plastic pollution: towards an international legally binding instrument**. Resolution adopted by the United Nations Environment Assembly on 2 March 2022 (UNEP/EA.5/Res.14). Available at: https://digitallibrary.un.org/record/3999257/files/UNEP_EA.5_RES.14-EN.pdf?ln=en. Accessed on 17 July 2022.

UNEA (2022b). Ad hoc open-ended expert group on marine litter and microplastics. Available at: <https://www.unep.org/environmentassembly/expert-group-on-marine-litter>. Accessed on 18 February 2023.

UNEA (2024). 6/4. Promoting synergies, cooperation or collaboration for national implementation of multilateral environmental agreements and other relevant environmental instruments (UNEP/EA.6/Res.4). Available at: <https://wedocs.unep.org/bitstream/handle/20.500.11822/45383/K2404172-E-UNEP-EA.6-Res.4.pdf?sequence=1&isAllowed=y>. Accessed on 29 April 2024.

UNEP (1995a). Decision 18/32 of the UNEP Governing Council: Persistent Organic Pollutants. 9th meeting, 25 May 1995. Available at: https://chm.pops.int/portals/0/docs/from_old_website/documents/background/gcdecision/18_32/gc1832en.html. Accessed on 17 July 2024.

UNEP (1995b). Global Programme of Action for the Protection of the Marine Environment from land-based activities. Intergovernmental Conference to adopt a Global Programme of Action for the protection of the marine environment from land-based activities. Washington, D.C., 23 October - 3 November 1995 (UNEP(OCA)/LBA/IG.2/7). Available at: <https://resolutions.unep.org/uploads/1995-gpa.pdf>. Accessed on 18 January 2024.

UNEP (1995c). Report of the Second Meeting of the Conference of the Parties to the Convention on Biological Diversity. Second meeting Jakarta, 6-17 November 1995 (UNEP/CBD/COP/2/19). Available at: <https://www.cbd.int/doc/meetings/cop/cop-02/official/cop-02-19-en.pdf>. Accessed on 27 March 2023.

UNEP (1997). Decisions adopted by the Governing Council at its nineteenth session. 13C. International action to protect human health and the environment through measures which will reduce and/or eliminate emissions and discharges of persistent

organic pollutants, including the development of an international legally binding instrument. Available at: https://chm.pops.int/portals/0/docs/from_old_website/documents/background/gcdecision/19_13c/gcpops_e.html. Accessed on 15 February 2023.

UNEP (1998). Final report of the meeting of the Intergovernmental Forum on Chemical Safety Ad Hoc Working Group on Persistent Organic Pollutants, held on 21 and 22 June 1996 in Manila – Note by the Secretariat (UNEP/POPS/INC.1/INF/4). Montreal, 29 June-3 July 1998. Available at: https://chm.pops.int/Portals/0/docs/from_old_website/documents/meetings/inc1/inf4.htm. Accessed on 12 April 2024.

UNEP (2001). First intergovernmental review meeting on the implementation of the GPA. Available at: [https://www.unep.org/explore-topics/oceans-seas/what-we-do/addressing-land-based-pollution/governing-global-programme-5#:~:text=The%20First%20Intergovernmental%20Review%20\(IGR,30%20November%20in%20Montreal%20Canada](https://www.unep.org/explore-topics/oceans-seas/what-we-do/addressing-land-based-pollution/governing-global-programme-5#:~:text=The%20First%20Intergovernmental%20Review%20(IGR,30%20November%20in%20Montreal%20Canada). Accessed on 13 April 2024.

UNEP (2003). Plan of Implementation of the World Summit on Sustainable Development. Available at: https://www.un.org/esa/sustdev/documents/WSSD_POI_PD/English/WSSD_PlanImpl.pdf. Accessed on 17 October 2023.

UNEP (2006). Second Intergovernmental Review Meeting on the Implementation of the GPA. Available at: <https://www.unep.org/explore-topics/oceans-seas/what-we-do/addressing-land-based-pollution/governing-global-programme-4>. Accessed on 17 October 2023.

UNEP (2009). Marine Litter: A Global Challenge. Nairobi: UNEP. 232 pp. ISBN 978-92-807-3029-6. Available at: <https://www.unep.org/resources/report/marine-litter-global-challenge>. Accessed on 13 January 2024.

UNEP (2011a). **Convention on Biological Diversity**. Text and Annexes - Secretariat of the Convention on Biological Diversity, Montreal. “This publication contains the text and annexes of the Convention on Biological Diversity, first adopted 22 May 1992”. Entry into force on 29 December 1993. Available at: <https://www.cbd.int/doc/legal/cbd-en.pdf>. Accessed on 15 May 2022.

UNEP (2011b). **Stockholm Convention on Persistent Organic Pollutants (POPs)** – as amended in 2009 (Text and Annexes). Available at: https://www.env.go.jp/chemi/pops/treaty/treaty_en2009.pdf. Accessed on 01 August 2023.

UNEP (2012a). First global conference on land-ocean connections. Available at: <https://www.unep.org/explore-topics/oceans-seas/what-we-do/addressing-land-based-pollution/governing-global-programme-3#:~:text=The%20Global%20Conference%20on%20Land,Marine%20Environment%20from%20Land%20Based>. Accessed on 22 October 2023.

UNEP (2012b). **Manila Declaration on Furthering the Implementation of the Global Programme of Action for the Protection of the Marine Environment from Land-based Activities**. Twelfth special session of the Governing Council/ Global

Ministerial Environment Forum Nairobi, 20–22 February 2012 (UNEP/GCSS.XII/INF/10). Available at: https://resolutions.unep.org/uploads/2012-manila_declaration-implementation_of_gpa.pdf. Accessed on 23 November 2023.

UNEP (2012c). Third intergovernmental review meeting on the implementation of the GPA. Available at: <https://www.unep.org/explore-topics/oceans-seas/what-we-do/addressing-land-based-pollution/governing-global-programme-0>. Accessed on 22 October 2023.

UNEP (2014a). Management of Marine Debris. Adopted by the Conference of the Parties at its 11th Meeting (Quito, 4-9 November 2014) (UNEP/CMS/Resolution 11.30). Available at: https://www.cms.int/sites/default/files/document/Res_11_30_Management_Marine_Debris_E.pdf. Accessed on 12 November 2023.

UNEP (2014b). **Marine plastic debris and microplastics**. United Nations Environment Assembly of the United Nations Environment Programme First session Nairobi, 23–27 June 2014 – Draft resolution submitted by the Committee of the Whole (UNEP/EA.1/L.8). Available at: https://digitallibrary.un.org/record/3966616/files/UNEP_EA.1_L.8-EN.pdf?ln=en. Accessed on 19 August 2024.

UNEP (2014c). **Valuing Plastics: The Business Case for Measuring, Managing and Disclosing Plastic Use in the Consumer Goods Industry**. This publication is a contribution to the Global Partnership on Marine Litter (GPML), p. 7. Available at: https://assets.eu.ctfassets.net/jchk06tdml2i/8640970377f042989e07186781195a0d/bb3258b0f82b92dd48dd1a58539ba0e1/UNEP_Plastic.pdf. Accessed on 21 October 2023.

UNEP (2015). **Biodegradable Plastics and Marine Litter**. Misconceptions, concerns and impacts on marine environments. United Nations Environment Programme (UNEP), Nairobi. Available at: https://wedocs.unep.org/bitstream/handle/20.500.11822/7468/-Biodegradable_Plastics_and_Marine_Litter_Misconceptions,_concerns_and_impacts_on_marine_environments-2015BiodegradablePlasticsAndMarineLitter.pdf.pdf?sequence=3&BisAllowed=1. Accessed on 30 October 2022.

UNEP (2011b). **Stockholm Convention on Persistent Organic Pollutants (POPs)** – as amended in 2009 (Text and Annexes). Available at: https://www.env.go.jp/chemi/pops/treaty/treaty_en2009.pdf. Accessed on 01 August 2023.

UNEP (2016a). **UNEP Frontiers 2016 Report: Emerging Issues of Environmental Concern**. United Nations Environment Programme, Nairobi, p. 32. Available at: https://wesr.unep.org/media/docs/assessments/UNEP_Frontiers_2016_report_emerging_issues_of_environmental_concern.pdf. Accessed on 17 February 2022.

UNEP (2016b). Generic and specific indicators for assessing progress in the attainment of the Aichi Biodiversity Targets, including an assessment of their main characteristics. Available at: <https://www.cbd.int/doc/strategic-plan/strategic-plan-indicators-en.pdf>. Accessed on 29 April 2023.

UNEP (2016c). XIII/28. Indicators for the Strategic Plan for Biodiversity 2011-2020 and the Aichi Biodiversity Targets. Decision adopted by the Conference of the Parties to the Convention on Biological Diversity (CBD/COP/DEC/XIII/28). Available at: <https://www.cbd.int/doc/decisions/cop-13/cop-13-dec-28-en.pdf>. Accessed on 29 April 2023.

UNEP (2016d). **Marine plastic debris and microplastics** – Global lessons and research to inspire action and guide policy change. United Nations Environment Programme, Nairobi. Available at: <https://www.unep.org/resources/publication/marine-plastic-debris-and-microplastics-global-lessons-and-research-inspire>. Accessed on 30 November 2023.

UNEP (2016e). **Resolution 1/6: Marine plastic debris and microplastics**. United Nations Environment Assembly of the United Nations Environment Programme Second session Nairobi, 23–27 May 2016 (UNEP/EA.2/5), p. 2. Available at: https://digitallibrary.un.org/record/3967653/files/UNEP_EA.2_5-EN.pdf?ln=en. Accessed on 29 November 2023.

UNEP (2016f). XIII/10. Addressing impacts of marine debris and anthropogenic underwater noise on marine and coastal biodiversity. Decision adopted by the Conference of the Parties to the Convention on Biological Diversity (CBD/COP/DEC/XIII/10). Available at: <https://www.cbd.int/doc/decisions/cop-13/cop-13-dec-10-en.pdf>. Accessed on 28 March 2023.

UNEP (2016g). **The First Global Integrated Marine Assessment: World Ocean Assessment**. The Group of Experts of the Regular Process. Lorna Inniss and Alan Simcock (Joint Coordinators) Amanuel Yoanes Ajawin; *et. al.* Available at: <https://www.unep.org/resources/report/first-global-integrated-marine-assessment-world-ocean-assessment-i>. Accessed on 12 April 2022.

UNEP (2016h). **Marine Litter Legislation: A Toolkit for Policymakers**. Report developed by the Environmental Law Institute (ELI) for the United Nations Environment Programme (UNEP), Nairobi, Kenya, p. 3. ISBN: 978-92-807-3594-9. Available at: <https://www.unep.org/resources/report/marine-litter-legislation-toolkit-policymakers>. Accessed on 18 August 2022.

UNEP (2017a). **Combating marine plastic litter and microplastics: an assessment of the effectiveness of relevant international, regional and subregional governance strategies and approaches**. Authors: Dr. Karen Raubenheimer, Dr. Nilüfer Oral, Prof. Alistair McIlgorm. Nairobi, p. 22. Available at: https://apps1.unep.org/resolutions/uploads/unep_aheg_2018_inf3_full_assessment_en.pdf. Accessed on 17 May 2022.

UNEP (2017b). **Global Programme of Action for the Protection of the Marine Environment from Land-Based Activities**. Available at: <https://www.unep.org/resources/toolkits-manuals-and-guides/global-programme-action-protection-marine-environment-land>. Accessed on 21 April 2024.

UNEP (2017c). **Management of Marine Debris**. Adopted by the Conference of the Parties at its 12th Meeting (Manila, October 2017) (UNEP/CMS/Resolution 12.20). Available at:

https://www.cms.int/sites/default/files/document/cms_cop12_res.12.20_marine_debris_e.pdf. Accessed on 14 November 2023.

UNEP (2017d). Management Of Marine Debris. Convention on Migratory Species – adopted by the Conference of the Parties at its 12th Meeting (Manila, October 2017) (UNEP/CMS/Resolution 12.20). Available at: https://www.cms.int/sites/default/files/document/cms_cop12_res.12.20_marine_debris_e.pdf. Accessed on 15 April 2023.

UNEP (2017e). Overview Report I: Worldwide initiatives to identify endocrine disrupting chemicals (EDCs) and potential EDCs. Prepared by: The International Panel on Chemical Pollution (IPCP). Available at: https://wedocs.unep.org/bitstream/handle/20.500.11822/25633/EDC_report1.pdf?sequence=1&isAllowed=y. Accessed on 13 December 2022.

UNEP (2017f). The Montreal Protocol: triumph by treaty. News, Stories & Speeches. Available at: <https://www.unep.org/news-and-stories/story/montreal-protocol-triumph-treaty#:~:text=The%20Montreal%20Protocol%20is%20the,protocol%2C%20and%20its%20four%20amendments..> Accessed on 09 March 2024.

UNEP (2018a). 14/10. Other matters related to marine and coastal biodiversity. Decision adopted by the Conference of the Parties to the Convention on Biological Diversity (CBD/COP/DEC/14/10). Available at: <https://www.cbd.int/doc/decisions/cop-14/cop-14-dec-10-en.pdf>. Accessed on 23 April 2023.

UNEP (2018b). **3/7. Marine litter and microplastics** (UNEP/EA.3/Res.7. 3/7). United Nations Environment Assembly of the United Nations Environment Programme. Available at: <https://undocs.org/UNEP/EA.3/Res.7>. Accessed on 10 May 2023.

UNEP (2018c). Fourth Intergovernmental Meeting of the Global Programme of Action. Working Group Meeting, 31 October - 1 November 2018 in Bali, Indonesia. Available at: <https://www.unep.org/cep/events/working-group-meeting/fourth-intergovernmental-meeting-global-programme-action>. Accessed on 17 September 2023.

UNEP (2018e). **3/7. Marine litter and microplastics**. United Nations Environment Assembly of the United Nations Environment Programme (UNEP/EA.3/Res.7. 3/7). Available at: <https://undocs.org/UNEP/EA.3/Res.7>. Accessed on 22 December 2021.

UNEP (2018f). About Montreal Protocol. Available at: <https://www.unep.org/ozonaction/who-we-are/about-montreal-protocol>. Accessed on 09 June 2023.

UNEP (2018g). Legal Limits on Single-Use Plastics and Microplastics: A Global Review of National Laws and Regulations, p. 6. Available at: <https://www.unep.org/resources/report/legal-limits-single-use-plastics-and-microplastics>. Accessed on 22 April 2024.

UNEP (2019a). **Bali Declaration**. Intergovernmental Review Meeting on the Implementation of the Global Programme of Action for the Protection of the Marine Environment from Land-based Activities Fourth session Bali, Indonesia, 31 October–1 November 2018 (UNEP/GPA/IGR.4/6). Available at: <https://apps1.unep.org/igr-meeting/sites/default/files/k1900652.pdf>. Accessed on 17 September 2023.

UNEP (2019b). Report of the Conference of the Parties to the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal on the work of its fourteenth meeting (UNEP/CHW.14/28). Available at: <https://www.brsmeas.org/Decisionmaking/COPsandExCOPs/2019COPs/Overview/tabid/7523/ctl/Download/mid/22150/language/es-CO/Default.aspx?id=5&ObjID=22103>. Accessed on 17 June 2023.

UNEP (2019c). Report of the fourth session of the Intergovernmental Review Meeting on the Implementation of the Global Programme of Action for the Protection of the Marine Environment from Land-based Activities. UNEP/GPA/IGR.4/5. Available at: <https://documents.un.org/doc/undoc/gen/k19/006/79/pdf/k1900679.pdf>. Accessed on 18 September 2023.

UNEP (2019d). Terms of reference for the Basel Convention Partnership on Plastic Waste and workplan for the working group of the Partnership on Plastic Waste for the biennium 2020–2021. Available at: <https://www.basel.int/Portals/4/download.aspx?d=UNEP-CHW.14-INF-16-Rev.1.English.pdf>. Accessed on 17 November 2024.

UNEP (2019f). Note by the Secretariat – Compilation of United Nations Environment Assembly resolutions on marine litter and microplastics (UNEP/AHEG/2019/3/INF/2). Ad hoc open-ended expert group on marine litter and microplastics Third meeting Bangkok, 18–22 November 2019. Available at: https://wedocs.unep.org/bitstream/handle/20.500.11822/32238/UNEAML_en.pdf?sequence=1&isAllowed=y. Accessed on 17 December 2021.

UNEP (2020a). The United Nations Decade on Ecosystem Restoration – Strategy. Available at: <https://wedocs.unep.org/bitstream/handle/20.500.11822/31813/ERDStrat.pdf?sequence=1&isAllowed=y>. Accessed on 27 April 2023.

UNEP (2020b). National guidance for plastic pollution hotspotting and shaping action - Introduction report. Boucher, J.; Zgola, M.; *et. al.* United Nations Environment Programme. Nairobi, Kenya. Available at: <https://wedocs.unep.org/bitstream/handle/20.500.11822/33166/NGP.pdf?sequence=1&isAllowed=y>. Accessed on 18 February 2023.

UNEP (2020c). An Assessment Report on Issues of Concern: Chemicals and Waste Issues Posing Risks to Human Health and the Environment. ISBN: 978-92-807-3808-7, p. 5. Available at: <https://saicmknowledge.org/sites/default/files/publications/Issues%20of%20Concern%20Report%20September%202020.pdf>. Accessed on 08 October 2022.

UNEP (2020e). **The Vienna Convention for the Protection of the Ozone Layer.** Ozone Secretariat – Treaties. Available at: <https://ozone.unep.org/treaties/vienna-convention>. Accessed on 16 December 2023.

UNEP (2021a). **Drowning in Plastics** – Marine Litter and Plastic Waste Vital Graphics. ISBN: 978-92-807-3888-9, p. 14. Available at: <https://www.unep.org/resources/report/drowning-plastics-marine-litter-and-plastic-waste-vital-graphics>. Accessed on 12 September 2023.

UNEP (2021b). **From Pollution to Solution**: A global assessment of marine litter and plastic pollution. Synthesis. Nairobi. ISBN: 978-92-807-3881-0, p. 3. Available at: https://malaysia.un.org/sites/default/files/2022-02/POLSOLSum_1.pdf. Accessed on 12 April 2023.

UNEP (2021c). Global Programme of Action for the Protection of the Marine Environment from Land-Based Activities (UNEP/GPA/ IGR.5/INF/6). Available at: <https://drive.google.com/file/d/10q52bibBaTeqKEUSpx0-L94Gc5YJjKEt/view>. Accessed on 15 August 2024.

UNEP (2021d). **Neglected**: Environmental Justice Impacts of Marine Litter and Plastic Pollution. Nairobi, p. 46. ISBN: 978-92-807-3852-0. Available at: <https://wedocs.unep.org/xmlui/bitstream/handle/20.500.11822/35417/EJIPP.pdf>. Accessed on 17 September 2023.

UNEP (2021e). Progress in the implementation of the Global Programme of Action for the Protection of the Marine Environment from Land-based Activities at the international, regional and national levels during the period 2019–2021 (UNEP/GPA/IGR.5/2 E). Available at: <https://uneplivemapservices.unep.org/bitstream/handle/20.500.11822/37817/UNEP-GPA-IGR.5-2.pdf?sequence=3&isAllowed=y>. Accessed on 18 September 2023.

UNEP (2021f). Provisional agenda (UNEP/GPA/IGR.5/1). Available at: <https://wedocs.unep.org/bitstream/handle/20.500.11822/37740/UNEP-GPA-IGR-5-1.pdf?sequence=3&isAllowed=y>. Accessed on 18 September 2023.

UNEP (2022a). 15/4. **Kunming-Montreal Global Biodiversity Framework**. Decision adopted by the Conference of the Parties to the Convention on Biological Diversity (CBD/COP/DEC/15/4). Available at: <https://www.cbd.int/doc/decisions/cop-15/cop-15-dec-04-en.pdf>. Accessed on 22 March 2023.

UNEP (2022b). **Ciencia de los plásticos**. Comité intergubernamental de negociación encargado de elaborar un instrumento internacional jurídicamente vinculante sobre la contaminación por plásticos, en particular en el medio marino. Primer período de sesiones Punta del Este, Uruguay, 28 de noviembre a 2 de diciembre de 2022 (UNEP/PP/INC.1/7). Available at: <https://wedocs.unep.org/bitstream/handle/20.500.11822/41170/K2221533%20-%20%20UNEP-PP-INC.1-7%20-%20ES.pdf?sequence=1&isAllowed=y>. Accessed on 13 January 2023.

UNEP (2022c). Fifth Intergovernmental Review Meeting on the Implementation of the Global Programme of Action (GPA). Available at: <https://www.unep.org/events/unep-event/fifth-intergovernmental-review-meeting-implementation-global-programme-action-gpa#:~:text=The%20GPA%20Intergovernmental%20Review%20Meeting,hosts%20the%20GPA%20Coordination%20Office>. Accessed on 13 April 2024.

UNEP (2022d). Outcome Report UNEP/EA.4/RES.6 Marine Plastic Litter and Microplastics. Reporting Period Dec-2022. Available at: <https://open.unep.org/resolution/outcome-report/339>. Accessed on 19 December 2024.

UNEP (2022e). Glossary of key terms. Intergovernmental negotiating committee to develop an international legally binding instrument on plastic pollution, including in the marine environment First session Punta del Este, Uruguay, 28 November–2 December 2022 Item 4 of the provisional agenda (UNEP/PP/INC.1/6). Available at: <https://uneplivemapservices.unep.org/bitstream/handle/20.500.11822/40683/K2221529%20-%20UNEP-PP-INC.1-6%20-%20Advance.pdf?sequence=1&isAllowed=y>. Accessed on 17 December 2022.

UNEP (2022f). Stakeholder dialogue at the first session of the intergovernmental negotiating committee to develop an international legally binding instrument on plastic pollution, including in the marine environment (Synthesis Report). Available at: <https://wedocs.unep.org/bitstream/handle/20.500.11822/41355/StakeholderDialogueSynthesisReport.pdf>. Accessed on 19 May 2023.

UNEP (2022h). Historic day in the campaign to beat plastic pollution: Nations commit to develop a legally binding agreement. Press release – Environmental rights and governance. Available at: <https://www.unep.org/news-and-stories/press-release/historic-day-campaign-beat-plastic-pollution-nations-commit-develop>. Accessed on 07 March 2022.

UNEP (2022i). **Broad options for the structure of the international legally binding instrument on plastic pollution, including in the marine environment, taking into account paragraphs 3 and 4 of United Nations Environment Assembly resolution 5/14** (UNEP/PP/INC.1/4). Note by the Secretariat. Available at: <https://documents.un.org/doc/undoc/gen/k22/120/79/pdf/k2212079.pdf>. Accessed on 13 June 2023.

UNEP (2022j). 15/6. Mechanisms for planning, monitoring, reporting and review. Conference of the Parties to the Convention on Biological Diversity Fifteenth meeting – Part II Montreal, Canada, 7-19 December 2022 (CBD/COP/DEC/15/6). Available at: <https://www.cbd.int/doc/decisions/cop-15/cop-15-dec-06-en.pdf>. Accessed on 13 September 2023.

UNEP (2022k). Japan submission for potential options for elements towards an international legally binding instrument, based on a comprehensive approach that addresses the full life cycle of plastics. Call for written submissions – Proposed response template on the potential options for elements towards an international legally binding instrument. Proposed response template (16 December 2022) / INC on Plastic Pollution. Available at: <https://wedocs.unep.org/bitstream/handle/20.500.11822/41794/Japansubmission.pdf?sequence=1&isAllowed=y>. Accessed on 12 September 2023.

UNEP (2022l). Potential elements, based on provisions in paragraphs 3 and 4 of United Nations Environment Assembly resolution 5/14, including key concepts, procedures and mechanisms of legally binding multilateral agreements that may be relevant to furthering implementation and compliance under the future international legally binding instrument on plastic pollution, including in the marine environment. Note by the secretariat, p. 4. (UNEP/PP/INC.1/5). Available at: https://wedocs.unep.org/bitstream/handle/20.500.11822/41269/Potential_Elements_E.pdf. Accessed on 20 October 2022.

UNEP (2022m). Report of the intergovernmental negotiating committee to develop an international legally binding instrument on plastic pollution, including in the marine environment, on the work of its first session. Punta del Este, Uruguay, 28 November–2 December 2022 (UNEP/PP/INC.1/14). Available at: <https://wedocs.unep.org/bitstream/handle/20.500.11822/42282/INC1reportReissuedAdvance.pdf>. Accessed on 21 January 2023.

UNEP (2022n). Integrate Extended Producer Responsibility within the International plastics Treaty. Common position Paper. Available at: https://apps1.unep.org/resolutions/uploads/integrate_epr_within_the_international_treaty_on_plastics_pollution_1.pdf. Accessed on 21 January 2023.

UNEP (2023a). Stockholm Convention on Persistent Organic Pollutants (POPs) Text and Annexes revised in 2023. Available at: <https://www.pops.int/Portals/0/download.aspx?d=UNEP-POPS-COP-CONVTEXT-2023.English.pdf>. Accessed on 17 November 2024.

UNEP (2023b). Potential options for elements towards an international legally binding instrument, based on a comprehensive approach that addresses the full life cycle of plastics as called for by United Nations Environment Assembly resolution 5/14. Preparation of an international legally binding instrument on plastic pollution, including in the marine environment, Paris, 29 May–2 June 2023 (UNEP/PP/INC.2/4). Available at: <https://wedocs.unep.org/xmlui/bitstream/handle/20.500.11822/42190/UNEP-PP-INC.2-4%20English.pdf>. Accessed on 13 May 2024.

UNEP (2023c). Bonn Declaration for a Planet Free of Harm from Chemicals and Waste. High-level segment of the fifth session of the International Conference on Chemicals Management, on 28 and 29 September 2023, Bonn, Germany. Available at: https://wedocs.unep.org/bitstream/handle/20.500.11822/46686/Bonn_declaration_EN.pdf?sequence=1&isAllowed=y. Accessed on 17 December 2024.

UNEP (2023e). Turning off the Tap: How the world can end plastic pollution and create a circular economy. Nairobi, p. 7. ISBN: 978-92-807-4024-0. Available at: <https://www.unep.org/resources/turning-off-tap-end-plastic-pollution-create-circular-economy>. Accessed on 02 March 2024.

UNEP (2023f). Plastic Treaty progress puts spotlight on circular economy. Story, Nature Action. Available at: <https://www.unep.org/news-and-stories/story/plastic-treaty-progress-puts-spotlight-circular-economy>. Accessed on 13 November 2023.

UNEP (2023g). Potential options for elements towards an international legally binding instrument, based on a comprehensive approach that addresses the full life cycle of plastics as called for by United Nations Environment Assembly resolution 5/14. Note by the Secretariat, p. 4. Available at: <https://wedocs.unep.org/xmlui/bitstream/handle/20.500.11822/42190/UNEP-PP-INC.2-4%20English.pdf?sequence=13&isAllowed=y>. Accessed on 12 June 2023.

UNEP (2023i). Revised draft text of the international legally binding instrument on plastic pollution, including in the marine environment. Note by the secretariat, p. 6-7 (UNEP/PP/INC.4/3). Available at: <https://wedocs.unep.org/bitstream/handle/20.500.11822/44526/RevisedZeroDraftText.pdf>. Accessed on 11 January 2024.

UNEP (2023j). China's text proposal in CG1 on B1 Primary Plastic Production. Third Session (INC-3): In-session documents. Available at: https://resolutions.unep.org/resolutions/uploads/china_primaryplasticproduction.pdf. Accessed on 11 January 2024.

UNEP (2023k). Provisional Agenda. Organizational matters: adoption of the agenda (UNEP/PP/INC.2/1). United Nations Environment Programme, 6 March 2023. Available at: <https://wedocs.unep.org/xmlui/bitstream/handle/20.500.11822/42199/2304071English.pdf?sequence=1&isAllowed=y>. Accessed on 1 July 2023.

UNEP (2023l). Report of the intergovernmental negotiating committee to develop an international legally binding instrument on plastic pollution, including in the marine environment, on the work of its second session (UNEP/PP/INC.2/5), 7 July 2023, p. 5. Available at: <https://wedocs.unep.org/bitstream/handle/20.500.11822/42953/FinalINC2Report.pdf>. Accessed on 12 July 2023.

UNEP (2023m). Annotated provisional agenda (UNEP/PP/INC.2/1/Add.1). Organizational matters: organization of work, 6 March 2023. Available at: <https://wedocs.unep.org/xmlui/bitstream/handle/20.500.11822/42205/2304072English.pdf?sequence=8&isAllowed=y>. Accessed on 12 July 2023.

UNEP (2023n). Third Session (INC-3). Available at: <https://www.unep.org/inc-plastic-pollution/session-3>. Accessed on 26 May 2024.

UNEP (2023o). Zero draft text of the international legally binding instrument on plastic pollution, including in the marine environment (UNEP/PP/INC.3/4). Available at: <https://wedocs.unep.org/bitstream/handle/20.500.11822/43239/ZERODRAFT.pdf>. Accessed on 19 March 2024.

UNEP (2023p). Contact Group 1 – REV Co-facilitators' updated full compilation of the revised zero draft text (19 November 2023, 14.55). Available at: <https://wedocs.unep.org/bitstream/handle/20.500.11822/44069/CG1ZeroDraftCompilation.docx>. Accessed on 13 May 2024.

UNEP (2023q). Contact Group 1 Co-facilitators' summary of discussions INC-3, Nairobi, 13-19 November 2023. Available at: https://wedocs.unep.org/bitstream/handle/20.500.11822/44081/CG1_Report.pdf. Accessed on 13 January 2024.

UNEP (2023r). Guidance for Contact Groups to be established at INC-3 (14 November 2023). Available at: <https://wedocs.unep.org/bitstream/handle/20.500.11822/43991/ContactGroups.pdf>. Accessed on 17 January 2024.

UNEP (2023s). Report of the intergovernmental negotiating committee to develop an international legally binding instrument on plastic pollution, including in the marine environment, on the work of its third session (UNEP/PP/INC.3/5). Available at: <https://wedocs.unep.org/bitstream/handle/20.500.11822/44760/INC3ReportE.pdf>. Accessed on 12 May 2024.

UNEP (2024a). **Global Waste Management Outlook 2024**: Beyond an age of waste – Turning rubbish into a resource. Nairobi, p. 29. DOI: <https://doi.org/10.59117/20.500.11822/44939>. Available at: <https://www.unep.org/resources/global-waste-management-outlook-2024>. Accessed on 11 January 2025.

UNEP (2024c). Fifth Session (INC-5). Available at: <https://www.unep.org/inc-plastic-pollution/session-5>. Accessed on 20 February 2025.

UNEP (2024d). **Minamata Convention on Mercury** (Text and Annexes) – 2024 Edition. Adopted on 10 October 2013. Entry into force on 16 August 2017. Available at: <https://minamataconvention.org/sites/default/files/documents/2024-10/Minamata-Convention-booklet-Oct2024-EN.pdf>. Accessed on 13 October 2024.

UNEP (2024e). Fourth Session (INC-4). Available at: <https://www.unep.org/inc-plastic-pollution/session-4>. Accessed on 16 May 2024.

UNEP (2024f). Report of the intergovernmental negotiating committee to develop an international legally binding instrument on plastic pollution, including in the marine environment, on the work of its fourth session (UNEP/PP/INC.4/5). Available at: https://wedocs.unep.org/bitstream/handle/20.500.11822/45872/INC4_Report.pdf. Accessed on 10 May 2024.

UNEP (2024g). Annotated provisional agenda – Fifth session of the Intergovernmental negotiating committee to develop an international legally binding instrument on plastic pollution, including in the marine environment (UNEP/PP/INC.5/1/Add.1). Available at: https://wedocs.unep.org/bitstream/handle/20.500.11822/46385/Annotated_Provisional_Agenda_E.pdf. Accessed on 16 January 2024.

UNEP (2024h). Non-Paper 3 of the Chair of the Committee. Available at: https://wedocs.unep.org/bitstream/handle/20.500.11822/46483/Non_Paper_3_E.pdf. Accessed on 22 December 2024.

UNEP (2024i). HAC Member States Ministerial Joint Statement for INC-5 Available at: https://resolutions.unep.org/incres/uploads/final-hac-ministerial-joint-statement-for-inc-5-for-publication-67-members_0.pdf. Accessed on 16 January 2025.

UNEP (2024j). Opening Statement for INC-5 on Behalf of Like-Minded Countries. Available at: https://resolutions.unep.org/incres/uploads/kuwait_on_behalf_of_like-minded_countries_0.pdf. Accessed on 02 January 2025.

UNEP (2024k). Non-Paper Containing Draft Text of the Chair of the Committee. Available at: https://wedocs.unep.org/bitstream/handle/20.500.11822/46705/Chair_Proposal.pdf. Accessed on 07 January 2025.

UNEP (2024l). Chair's Text (1 December 2024). Available at: https://wedocs.unep.org/bitstream/handle/20.500.11822/46710/Chairs_Text.pdf. Accessed on 12 January 2025.

UNEP (2025a). Second Part of the Fifth Session (INC-5.2). Press Release “Talks on global plastic pollution treaty adjourn without consensus”. Available at: <https://www.unep.org/inc-plastic-pollution/media#PressRelease15Aug>. Accessed on 22 August 2025.

UNEP (2025b). Draft report of the intergovernmental negotiating committee to develop an international legally binding instrument on plastic pollution, including in the marine environment, on the work of the first part of its fifth session (UNEP/PP/INC.5/8). Available at: https://wedocs.unep.org/bitstream/handle/20.500.11822/47162/INC_5_1_Report.pdf. Accessed on 20 February 2025.

UNEP (2025c). Informal Heads of Delegation Meeting. 30 June - 2 July 2025, Nairobi, Kenya. Available at: <https://www.unep.org/inc-plastic-pollution/session-5.2/hods>. Accessed on 20 August 2025.

UNEP (2025d). Draft report of the intergovernmental negotiating committee to develop an international legally binding instrument on plastic pollution, including in the marine environment, on the work of its resumed fifth session (UNEP/PP/INC.5/L.2). Available at: https://resolutions.unep.org/incres/uploads/inc_5.2_report.pdf. Accessed on 20 August 2025.

UNEP (2025e). Assembled text. UNEP/PP/INC.5/CRP.1. Available at: https://resolutions.unep.org/incres/uploads/k2512852e_-_unep-pp-inc-5-crp.1_-_amended_final.pdf. Accessed on 23 August 2025.

UNEP; BRS (2023). **Chemicals in plastics**: a technical report. Geneva, ISBN: 978-92-807-4026-4, p. 47. Available at: <https://wedocs.unep.org/bitstream/handle/20.500.11822/42366/Chemicals-in-Plastics.pdf?sequence=1&isAllowed=y>. Accessed on 05 April 2024.

UNEP; CMS (2011). Proceedings of the Tenth Meeting of the Conference of the Parties. Adoption of Resolutions, p. 49. Available at: https://www.cms.int/sites/default/files/publication/COP10_Proceedings_E_491_pages.pdf. Accessed on 16 August 2024.

UNEP; CMS (2014). The Strategic Plan for Migratory Species 2015-2023. Available at: https://www.cms.int/sites/default/files/document/CMS_Sharks_MOS2_Inf_9.pdf. Accessed on 12 November 2023.

UNEP; FAO (2017). Report of the Conference of the Parties to the Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade on the work of its eighth meeting (UNEP/FAO/RC/COP.8/27). Geneva, 24 April–5 May 2017. Available at: <https://www.brsmeas.org/Decisionmaking/COPsandExCOPs/2017COPs/2017COPs/Overview/tabid/5306/ctl/Download/mid/18530/language/en-US/Default.aspx?id=5&ObjID=44957>. Accessed on 19 May 2023.

UNEP; SAICM (2019b). SAICM – Factsheet. Available at: <https://www.saicm.org/Portals/12/Documents/SAICM-Factsheet.pdf>. Accessed on 22 September 2024.

UNGA (1992). Rio Declaration on Environment and Development. Report of the United Nations Conference on Environment and Development, Rio de Janeiro, 3-14 June 1992 (A/CONF.151/26 (Vol. I)). Available at: https://www.un.org/en/development/desa/population/migration/generalassembly/docs/globalcompact/A_CONF.151_26_Vol.I_Declaration.pdf. Accessed on 10 May 2023.

UNGA (1994). **Agreement relating to the Implementation of Part XI of the United Nations Convention on the Law of the Sea of 10 December 1982**. Forty-eighth session Agenda item 36 Resolution adopted by the General Assembly (A/RES/48/263). Available at: <https://digitallibrary.un.org/record/161900?v=pdf>. Accessed on 18 August 2024.

UNGA (1995). LAW OF THE SEA – Report of the Secretary-General (A/50/713). Fiftieth session, Agenda item 39. Available at: <https://documents.un.org/doc/undoc/gen/n95/337/72/pdf/n9533772.pdf>. Accessed on 13 November 2024.

UNGA (1999). 54/33. Results of the review by the Commission on Sustainable Development of the sectoral theme of “Oceans and seas”: international coordination and cooperation. Fifty-fourth session Agenda item 40 (c), Resolution adopted by the General Assembly A/RES/54/33. Available at: <http://www.worldlii.org/int/other/UNGA/1999/71.pdf>. Accessed on 12 March 2024.

UNGA (2000). 55/2. United Nations Millennium Declaration. Resolution adopted by the General Assembly (A/RES/55/2). Fifty-fifth session Agenda item 60 (b), 18 September 2000. Available at <https://documents.un.org/doc/undoc/gen/n00/559/51/pdf/n0055951.pdf>. Accessed on 13 May 2023.

UNGA (2001). Road map towards the implementation of the United Nations Millennium Declaration. Fifty-sixth session Item 40 of the provisional agenda* Follow-up to the outcome of the Millennium Summit. Report of the Secretary-General (A/56/326). Available at: <https://www.un.org/millenniumgoals/sgreport2001.pdf>. Accessed on 11 May 2023.

UNGA (2005). Report on the work of the United Nations Open-ended Informal Consultative Process on Oceans and the Law of the Sea at its sixth meeting. Sixtieth session Item 76 (a) of the preliminary list* Oceans and the law of the sea. Available at: <https://documents.un.org/doc/undoc/gen/n05/414/01/pdf/n0541401.pdf>. Accessed on 15 March 2024.

UNGA (2006). **Fragmentation of International Law**: difficulties arising from the diversification and expansion of International Law. Report of the Study Group of the ILC, p. 3. Available at: https://legal.un.org/ilc/documentation/english/a_cn4_1702.pdf. Accessed on 17 September 2022.

UNGA (2010). 65/1. Keeping the promise: united to achieve the Millennium Development Goal. Resolution adopted by the General Assembly on 22 September 2010 (A/RES/65/1). Available at: <https://digitallibrary.un.org/record/692292?v=pdf>. Accessed on 21 May 2023.

UNGA (2013). 67/290. Format and organizational aspects of the high-level political forum on sustainable development. Resolution adopted by the General Assembly on 9 July 2013 (A/RES/67/290). Available at: <https://documents.un.org/doc/undoc/gen/n12/496/00/pdf/n1249600.pdf>. Accessed on 17 May 2023.

UNGA (2015). **70/1. Transforming our world:** the 2030 Agenda for Sustainable Development. Resolution adopted by the General Assembly on 25 September 2015 (A/RES/70/1). Available at: <https://documents.un.org/doc/undoc/gen/n15/291/89/pdf/n1529189.pdf>. Accessed on 23 February 2023.

UNGA (2016). Report on the work of the United Nations Open-ended Informal Consultative Process on Oceans and the Law of the Sea at its seventeenth meeting. Seventy-first session Item 74 (a) of the provisional agenda* Oceans and the law of the sea: oceans and the law of the sea. Available at: <https://documents.un.org/doc/undoc/gen/n16/234/77/pdf/n1623477.pdf>. Accessed on 15 March 2024.

UNGA (2017a). 71/312. Our ocean, our future: call for action. Seventy-first session Agenda items 19 and 73 (a) Resolution adopted by the General Assembly on 6 July 2017 (A/RES/71/312). Available at: https://digitallibrary.un.org/record/1291421/files/A_RES_71_312-EN.pdf?ln=en. Accessed on 12 February 2022.

UNGA (2017b). 71/221. Entrepreneurship for sustainable development. Resolution adopted by the General Assembly on 21 December 2016 (A/RES/71/221). Available at: <https://docs.un.org/en/A/RES/71/221>. Accessed on 08 February 2022.

UNGA (2018a). 72/73. Oceans and the law of the sea. Resolution adopted by the General Assembly on 5 December 2017 (A/RES/72/73). Available at: https://www.un.org/en/development/desa/population/migration/generalassembly/docs/globalcompact/A_RES_72_73.pdf. Accessed on 28 September 2023.

UNGA (2018b). Sustainable Development – Report of the Second Committee. Seventy-third session, Agenda item 20 (A/73/538). Available at: <https://docs.un.org/en/A/73/538>. Accessed on 04 January 2022.

UNGA (2018c). Summary record of the joint meeting of the Second Committee and the Economic and Social Council on “The Circular Economy for the Sustainable Development goals: From Concept to Practice”. General Assembly Second Committee 7th meeting Economic and Social Council 2019 session 3rd meeting (A/C.2/73/SR.7–E/2019/SR.3). Available at: <https://documents.un.org/doc/undoc/gen/n18/315/04/pdf/n1831504.pdf>. Accessed on 06 March 2022.

UNGA (2019a). 73/284. United Nations Decade on Ecosystem Restoration (2021–2030). Resolution adopted by the General Assembly on 1 March 2019 (A/RES/73/284). Available at: <https://documents.un.org/doc/undoc/gen/n19/060/16/pdf/n1906016.pdf>. Accessed on 23 April 2023.

UNGA (2019b). Preparatory process of the 2020 United Nations Conference to Support the Implementation of Sustainable Development Goal 14: Conserve and sustainably use the oceans, seas and marine resources for sustainable development (A/74/630). Available at: <https://documents.un.org/doc/undoc/gen/n19/435/89/pdf/n1943589.pdf>. Accessed on 17 May 2023.

UNGA (2019c). 73/292. 2020 United Nations Conference to Support the Implementation of Sustainable Development Goal 14: Conserve and sustainably use the oceans, seas and marine resources for sustainable development (A/RES/73/292). Available at: <https://documents.un.org/doc/undoc/gen/n19/136/24/pdf/n1913624.pdf>. Accessed on 12 May 2023.

UNGA (2022). 76/300. The human right to a clean, healthy and sustainable environment. Resolution adopted by the General Assembly on 28 July 2022 (A/RES/76/300). Available at: <https://documents.un.org/doc/undoc/gen/n22/442/77/pdf/n2244277.pdf>. Accessed on 10 May 2023.

UNGA (2024). **Oceans and the law of the sea**. Seventy-ninth session Agenda item 75 (a) (A/79/L.37). Available at: <https://docs.un.org/en/A/79/L.37>. Accessed on 07 January 2025.

UNOC (2025b). The Nice Commitments for the Ocean. 3rd United Nations Ocean Conference, Nice, 2-13 June 2025. Available at: <https://www.elysee.fr/admin/upload/default/0001/18/8bf8571c69e44c361a2ec0727c152abc09ae998b.pdf>. Accessed on 12 August 2025.

UNOC (2025c). The Nice wake up call for an ambitious plastics treaty. Available at: <https://www.ecologie.gouv.fr/sites/default/files/documents/The%20Nice%20wake%20up%20call%20for%20an%20ambitious%20plastics%20treaty.pdf>. Accessed on 12 August 2025.

U.S. District Court for the Western District of Missouri (2024). Rodriguez *et al.* v. Exxon Mobil Corporation *et al.*, No. 4:24-cv-00803 (W.D. Mo. filed 2024). Available at: https://stateimpactcenter.org/files/1_2025-01-09-151641_okjo.pdf. Accessed on 12 January 2025.

United States District Court (2020). Kathleen Smith (Plaintiff) v. Keurig Green Mountain, Inc. (Defendant), Case No. 18-cv-06690-HSG. Available at: https://climatecasechart.com/wp-content/uploads/case-documents/2020/20200921_docket-418-cv-06690_order.pdf. Accessed on 17 February 2025.

United States District Court (2022). Kathleen Smith, on behalf of herself and all others similarly situated (Plaintiff) v. Keurig Green Mountain, Inc. (Defendant), Case No. 4:18-cv-06690-HSG. Available at: <https://stateimpactcenter.org/files/Smith-v.-Keurig-Green-4-18-cv-06690-motion.pdf>. Accessed on 17 February 2025.

UNSDG (2019). Foundational primer on the 2030 Agenda for sustainable development. United Nations Sustainable Development Group, p. 10. Available at: <https://unsdg.un.org/sites/default/files/2019-11/UNSDG-SDG-Primer-Report.pdf>. Accessed on 13 May 2023.

Urho, N.; *et. al.* (2019). **International Environmental Governance** Accomplishments and Way Forward. Nordic Council of Ministers, p. 79. DOI: <https://doi.org/10.6027/TN2019-518>. Available at: <https://norden.diva-portal.org/smash/record.jsf?pid=diva2%3A1289927&dswid=-3786>. Accessed on 22 March 2022.

Vierros, M.; Buonomo, R. (2017). In-depth analysis of Ocean Conference Voluntary Commitments to support and monitor their implementation. Prepared By Division for Sustainable Development Department of Economic and Social Affairs United Nations, p. 2. Available at: https://sustainabledevelopment.un.org/content/documents/17193OCVC_in_depth_analysis.pdf. Accessed on 15 January 2024.

WCED (1987). **Our Common Future** (Brundtland Report). Report of the World Commission on Environment and Development, from A/42/427. United Nations, Oslo, 20 March 1987. Available at: <https://sustainabledevelopment.un.org/content/documents/5987our-common-future.pdf>. Accessed on 02 April 2022.

World Bank (2016). **Oceans 2030** – Financing the Blue Economy for a Sustainable Development. World Bank Group, 2016. Available at: <https://thedocs.worldbank.org/en/doc/446441473349079068-0010022016/original/AMCOECCBlueEconomyDevelopmentFramework.pdf>. Accessed on 15 November 2024.

WTO (1994a). General Agreement on Tariffs and Trade 1994. Adopted 15 April 1994, entered into force 1 January 1995. Available at: https://www.wto.org/english/docs_e/legal_e/gatt94_e.htm. Accessed on 30 August 2025.

WTO (1994b). Agreement on Technical Barriers to Trade. Adopted as part of the Uruguay Round agreements and entered into force on January 1, 1995. Available at: https://www.wto.org/english/docs_e/legal_e/tbt_e.htm. Accessed on 20 August 2025.

WTO (2021). Informal Dialogue on Plastic Pollution and Environmentally Sustainable Plastics Trade (IDP). MC12 Ministerial Statement on plastic pollution and environmentally sustainable plastics trade. Ministerial Conference Twelfth Session Geneva, 30 November-3 December 2021 (WT/MIN(21)/8). Available at: <https://docs.wto.org/dol2fe/Pages/SS/directdoc.aspx?filename=q:/WT/MIN21/8.pdf&Open=True>. Accessed on 13 September 2024.

WTO (2022). Informal Dialogue on Plastic Pollution and Environmentally Sustainable Plastics Trade – Background information for press. Available at: https://www.wto.org/english/thewto_e/minist_e/mc12_e/idp_press_background.pdf. Accessed on 12 November 2024.

WTO (2024). Dialogue on Plastic Pollution and Environmentally Sustainable Plastics Trade (DPP) MC13 Statement Revision (INF/TE/IDP/W/10/Rev.2). Available at: <https://www.tralac.org/documents/resources/external-relations/wto/mc13/5217-dialogue-on-plastic-pollution-and-environmentally-sustainable-plastics-trade-dpp-mc13-statement-revision-19-january-2024/file.html>. Accessed on 13 September 2024.

D) Other sources

ABIPLAST (2021). Perfil 2021 - The plastic transformation and recycling industries in Brazil. *Associação Brasileira da Indústria do Plástico*, p. 18. Available at: https://www.abiplast.org.br/wp-content/uploads/2022/09/PERFIL_2021_EN_FINAL.pdf. Accessed on: 11 February 2024.

Allen, D.; *et al.* (2024). The Fraud of Plastic Recycling: How Big Oil and the plastics industry deceived the public for decades and caused the plastic waste crisis. Center for Climate Integrity, p. 5. Available at: <https://climateintegrity.org/uploads/media/Fraud-of-Plastic-Recycling-2024.pdf>. Accessed on 15 August 2024.

American Association For The Advancement Of Science (2010). New frontiers in science diplomacy: Navigating the changing balance of power. **The Royal Society**, p. 2. ISBN: 978-0-85403-811-4. Available at: https://www.aaas.org/sites/default/files/New_Frontiers.pdf. Accessed on 03 May 2024.

Ammendolia, J.; Walker, T.R. (2022a). U.S. Seeks Weaker Global Plastics Treaty. SSRN, Abstract. Available at: <https://ssrn.com/abstract=4248247>. Accessed on 22 December 2022.

AOSIS (2023). We are Small Island Development States. Available at: <https://www.aosis.org/>. Accessed on 12 June 2024.

Arnaldi, S. (2023). **Science Diplomacy: Foundations and practice**. Trieste: EUT Edizioni Università di Trieste, p. 80. eISBN 978-88-5511-403-5 (online). Available at: <https://www.openstarts.units.it/server/api/core/bitstreams/71b32984-3958-4286-b5cb-a26cc28060f3/content>. Accessed on 17 December 2024.

Amazon (2021). Reducing waste & packaging. Available at: <https://sustainability.aboutamazon.com/waste#:~:text=for%20recycled%20output.-,Amazon%20Second%20Chance,responsibly%20dispose%20of%20Amazon%20packaging..> Accessed on 12 January 2025.

Brunon-Meunier, C. (2023). *La diplomatie scientifique : un concept encore à inventer ? Science de la durabilité* - Fiche n° 7 (Références IRD - Institut de Recherche pour le Développement), p. 2. Available at: https://www.ird.fr/sites/ird_fr/files/2023-02/Fiche_SciDur_73%20Brunon-Meunier.pdf. Accessed on 12 April 2024.

Basel Action Network (2025). Plastic Waste Trade Data. Available at: <https://www.ban.org/plastic-waste-transparency-project-hub/trade-data>. Accessed on 15 February 2025.

BRICS Brasil 2025 (2025). Scientific cooperation among BRICS countries strengthens oceanic and polar research. Available at: <https://brics.br/en/news/scientific-cooperation-among-brics-countries-strengthens-oceanic-and-polar-research>. Accessed on 28 August 2025.

BRS (2022). Questions and answers related to the Basel Convention Plastic Waste Amendments. Available at:

<https://www.basel.int/implementation/plasticwaste/plasticwasteamendments/faqs/tabid/8427/default.aspx>. Accessed on 21 January 2023.

BRS (2023). **Global governance of plastics and associated chemicals**. Secretariat of the Basel, Rotterdam and Stockholm Conventions, United Nations Environment Programme, Geneva. Karen Raubenheimer, Niko Urho, p. 63. Available at: <https://www.basel.int/Portals/4/Basel%20Convention/docs/plastic%20waste/UNEP-FAO-CHW-RC-POPS-PUB-GlobalGovernancePlastics-2023.pdf>. Accessed on 02 August 2024.

Burger, M.; Gundlach, J. (2017). **The status of climate change litigation**: a global review. 1st Edition. Nairobi: Sabin Center for Climate Change Law and United Nations Environment Programme, 41 p. ISBN 978-92-807-3656-4. Available at: https://scholarship.law.columbia.edu/cgi/viewcontent.cgi?article=1097&context=sabin_climate_change. Accessed on 19 December 2024.

CBD (2011). NBSAP training modules version 2.1 – Module 1. An Introduction to National Biodiversity Strategies and Action Plans. Montreal, June 2011. Available at: <https://www.cbd.int/doc/training/nbsap/b1-train-intro-nbsap-revised-en.pdf>. Accessed on 11 September 2023.

Center for International Environmental Law (2023). Implementation, Compliance, and Reporting: Key Elements to Consider in the Context of a Treaty to End Plastic Pollution. Available at: https://www.ciel.org/reports/preparatory-materials-for-the-plastics-treaty-inc-3-august-2023/implementation-compliance-and-reporting-key-elements-to-consider-in-the-context-of-a-treaty-to-end-plastic-pollution_final/. Accessed on 11 January 2024.

Center for International Environmental Law (2024a). Analysis of the Revised Zero Draft of the Plastics Treaty. Available at: https://www.ciel.org/wp-content/uploads/2024/03/Annotated_Zero_Draft_INC4.pdf. Accessed on 05 April 2024.

Center for International Environmental Law (2024b). Plastic Polymers under the Full Life Cycle Approach: Key Considerations on the Scope of the Future Plastics Treaty. Available at: <https://www.ciel.org/wp-content/uploads/2024/04/plastic-polymers-full-life-cycle-of-plastics-brief.pdf>. Accessed on 18 May 2024.

Center for International Environmental Law (2024c). Fossil Fuel Lobbyists Flood Final Scheduled Round of Global Plastics Treaty Negotiations. Available at: <https://www.ciel.org/news/inc-5-lobbyist-analysis/>. Accessed on 12 January 2025.

Centre International de Droit Comparé de l'Environnement (2023). *Propositions du CIDCE*. Deuxième session du Comité intergouvernemental de négociation chargé d'élaborer un instrument international juridiquement contraignant sur la pollution plastique, y compris dans le milieu marin (Paris, 29 mai - 2 juin 2023). Available at: <https://cidce.org/fr/plastiques/>. Accessed on 30 June 2023.

Charles, D.; Kimman, L. (2023). Plastic Waste Makers Index 2023. Minderoo Foundation. Available at: <https://cdn.minderoo.org/content/uploads/2023/02/04205527/Plastic-Waste-Makers-Index-2023.pdf>. Accessed on 12 April 2024.

Cheshire, A.; Adler, E. (2009). UNEP/IOC Guidelines on Survey and Monitoring of Marine Litter. Regional Seas Reports and Studies No 186. IOC Technical Series No 83. United Nations Environment Programme / Intergovernmental Oceanographic Commission. ISBN 978-92-807-3027-2. Available at: <https://wedocs.unep.org/xmlui/bitstream/handle/20.500.11822/13604/rsrs186.pdf?sequence=1&isAllowed=y>. Accessed on 13 December 2021.

Commonwealth Foundation (2021). Agreement for the establishment of the Commission of Small Island States on Climate Change and International Law. Entry into force on 31 October 2021. Available at: <https://commonwealthfoundation.com/wp-content/uploads/2021/12/Commission-of-Small-Island-States-on-Climate-Change-and-International-Law.pdf>. Accessed on 13 June 2024.

COSIS (2022). About COSIS. Available at: <https://www.cosis-ccil.org/about>. Accessed on 12 June 2024.

Calmet, D.P. (1989). Ocean disposal of radioactive waste: Status report. IAEA Bulletin, n. 4, p. 47. International Atomic Energy Agency Publications. Available at: <https://www.iaea.org/sites/default/files/31404684750.pdf>. Accessed on 12 June 2023.

Cambridge Econometrics; Trinomics; ICF (2018). Impacts of circular economy policies on the labour market. Final report, p. 39. Available at: https://circulareconomy.europa.eu/platform/sites/default/files/ec_2018_-_impacts_of_circular_economy_policies_on_the_labour_market.pdf. Accessed on 12 June 2023.

Carlini, G.; Azoulay, D.; Allary, C. (2024). Paving the Way to a Toxic-Free Planet: The New Global Framework on Chemicals – for a Planet Free of Harm from Chemicals and Waste. Center for International Environmental Law (CIEL), Blog Post, Published January 31, 2024. Available at: <https://www.ciel.org/global-framework-chemicals-toxic-free-planet/#:~:text=The%20Framework%20consists%20of%20five,lifecycle%2C%20including%20products%20and%20waste>. Accessed on 11 July 2024.

CBD (2018). People depend on marine and coastal biodiversity for their livelihoods. Available at: <https://www.cbd.int/article/food-2018-11-21-09-29-49#:~:text=Over%20three%20billion%20people%20depend,most%2Dtraded%20food%20commodities%20worldwide..> Accessed on 19 February 2024.

CBD Secretariat (2024). List of Parties. Convention on Biological Diversity. Available at: <https://www.cbd.int/information/parties.shtml>. Accessed on 22 April 2023.

Chasek, P. (2023). Stockholm Convention on Persistent Organic Pollutants. Earth Negotiations Bulletin (a division of the International Institute for Sustainable Development - IISD). Available at: <https://enb.iisd.org/articles/Stockholm-convention#:~:text=The%2012%20POPs%2C%20sometimes%20called,produced%20POPs%3A%20dioxins%20and%20furans>. Accessed on 11 May 2023.

Circle Economy (2020). The Circularity Gap Report 2020. Third Edition, p. 21. Available at: https://cdn.prod.website-files.com/5e185aa4d27bcf348400ed82/5e26ead616b6d1d157ff4293_20200120%20-

%20CGR%20Global%20-%20Report%20web%20single%20page%20-%2020210x297mm%20-%20compressed.pdf. Accessed on 12 June 2023.

Circular Economy Coalition (2021). Latin America and the Caribbean launches the Circular Economy Coalition. Available at: <https://coalicioneconomiacircular.org/en/latin-america-and-the-caribbean-launches-the-circular-economy-coalition/>. Accessed on 03 July 2023.

Circular Economy Coalition (2022). Circular Economy in Latin America and the Caribbean: A Shared Vision. Available at: <https://www.unep.org/resources/publication/circular-economy-latin-america-and-caribbean-shared-vision>. Accessed on 07 July 2023.

ClientEarth (2022). Plastics on trial: a briefing series on evolving liability risks related to plastics. Brief 4 Waste disposal & recycling. Available at: <https://www.clientearth.org/media/durfpjzw/plastics-on-trial-4-waste.pdf>. Accessed on 16 February 2025.

CMS Secretariat (2022). CMS – Convention on the Conservation of Migratory Species of Wild Animals. Available at: <https://www.cms.int/en/legalinstrument/cms>. Accessed on 16 November 2024.

CMS Secretariat (2024). Parties and Range States – Convention on the Conservation of Migratory Species of Wild Animals. Available at: <https://www.cms.int/en/parties-range-states>. Accessed on 16 November 2024.

Coffee, D.; *et. al.* (2020). Plastic Waste in Los Angeles County Impacts, Recyclability, and the Potential for Alternatives in the Food Service Sector. Available at: https://innovation.luskin.ucla.edu/wp-content/uploads/2020/02/Plastic_Waste_in_LA_County.pdf. Accessed on 08 December 2024.

Council of the European Union (2024b). Zero pollution: Council agrees its position on reducing plastic pellet losses, including in maritime transport. Available at: <https://www.consilium.europa.eu/en/press/press-releases/2024/12/17/zero-pollution-council-agrees-its-position-on-reducing-plastic-pellet-losses-including-in-maritime-transport/>. Accessed on 22 December 2024.

Dalberg Advisors; WWF Mediterranean Marine Initiative (2019). Stop the Flood of Plastic: How Mediterranean countries can save their sea. Published by WWF - World Wide Fund for Nature (formerly World Wildlife Fund), p. 12. Available at: https://awsassets.panda.org/downloads/a4_plastics_reg_low.pdf. Accessed on 03 March 2022.

Dreyer, E.; *et. al.* (2024). **Towards a Global Plastics Treaty**: Tracing the UN Negotiations. Lund University. Lund, Sweden, p. 13. ISBN: 978-91-7895-993-8. Available at: https://portal.research.lu.se/files/173635177/Dreyer_et_al._2024_-_Towards_a_Global_Plastics_Treaty_-_Tracing_the_UN_negotiations.pdf. Accessed on 30 December 2024.

Earth Negotiations Bulletin (2022). Summary of the First Meeting of the Intergovernmental Negotiating Committee to Develop an International Legally Binding Instrument on Plastic Pollution: 28 November – 2 December 2022, p. 2. Available at: <https://enb.iisd.org/sites/default/files/2022-12/enb3607e.pdf>. Accessed on 31 May 2023.

Earth Negotiations Bulletin (2023a). Summary of the Second Meeting of the Intergovernmental Negotiating Committee to Develop an International Legally Binding Instrument on Plastic Pollution: 29 May – 2 June 2023. Available at: <https://enb.iisd.org/sites/default/files/2023-06/enb3612e.pdf>. Accessed on 6 July 2023.

Earth Negotiations Bulletin (2023b). Summary of the Third Session of the Intergovernmental Negotiating Committee to Develop an International Legally Binding Instrument on Plastic Pollution: 11-19 November 2023. Vol. 36, n. 20. Available at: <https://enb.iisd.org/sites/default/files/2023-11/enb3620e.pdf>. Accessed on 30 December 2023.

Earth Negotiations Bulletin (2024a). Summary of the Fourth Session of the Intergovernmental Negotiating Committee to Develop an International Legally Binding Instrument on Plastic Pollution: 23-29 April 2024. Vol. 36, n. 27, p. 12. Available at: <https://enb.iisd.org/sites/default/files/2024-05/enb3627e.pdf>. Accessed on 17 July 2024.

Earth Negotiations Bulletin (2024b). Summary of the First Session of the Fifth Session of the Intergovernmental Negotiating Committee to Develop an International Legally Binding Instrument on Plastic Pollution: 25 November – 2 December 2024. Vol. 36, n. 34, p. 3-8. Available at: <https://enb.iisd.org/sites/default/files/2024-12/enb3634e.pdf>. Accessed on 06 January 2025.

Earth Negotiations Bulletin (2024c). Plastic Pollution INC-5 Highlights: Saturday, 30 November 2024. Vol. 36, n. 33, p. 1. Available at: <https://enb.iisd.org/sites/default/files/2024-11/enb3633e.pdf>. Accessed on 07 January 2025.

Earth Negotiations Bulletin (2025). Summary of the Resumed Fifth Session of the Intergovernmental Negotiating Committee to Develop an International Legally Binding Instrument on Plastic Pollution, including in the Marine Environment: 5-15 August 2025. Vol. 36 No. 43, Monday, 18 August 2025. Available at: <https://enb.iisd.org/sites/default/files/2025-08/enb3643e.pdf>. Accessed on 22 August 2025.

Environmental Investigation Agency (2022a). Global Plastics Treaty: Initial Considerations for INC-1. Available at: https://resolutions.unep.org/resolutions/uploads/briefing_-_initial_considerations_for_inc-1_2022.pdf. Accessed on 18 July 2023.

Environmental Investigation Agency (2022b). Convention on Plastic Pollution Essential Elements: Financial Aspects. Available at: <https://eia-international.org/wp-content/uploads/EIA-Essential-Elements-Finance-SINGLES.pdf>. Accessed on 07 May 2023.

European Commission (2023). Humans, Science, and Policy Making: Behind the Scenes of IPCC reports. News Article. Available at: <https://climate.ec.europa.eu/news-your->

voice/news/humans-science-and-policy-making-behind-scenes-ipcc-reports-2023-03-20_en. Accessed on 02 February 2024.

Edwards, J. (2024). Pepsi, Coca-Cola untruthful about about single-use plastic waste, lawsuit claims. Available at: <https://topclassactions.com/lawsuit-settlements/class-action-news/pepsi-coca-cola-untruthful-about-about-single-use-plastic-waste-lawsuit-claims/>. Accessed on 12 December 2024.

Elgin, B. (2022). Big Soda's Addiction to New Plastic Jeopardizes Climate Progress. Bloomberg, Green. Available at: <https://www.bloomberg.com/features/2022-coke-pepsi-plastic-recycling-climate-action/?leadSource=uverify%20wall>. Accessed on 07 December 2024.

Ellen MacArthur Foundation (2013). Towards the circular economy: economic and business rationale for an accelerated transition. Vol. 1, p. 7. Available at: <https://www.ellenmacarthurfoundation.org/towards-the-circular-economy-vol-1-an-economic-and-business-rationale-for-an>. Accessed on 03 January 2022.

Ellen MacArthur Foundation; Arup (2018). The Circular Economy Opportunity for Urban & Industrial Innovation in China. Report, p. 21. Available at: <https://www.arup.com/insights/the-circular-economy-opportunity-for-urban-and-industrial-innovation-in-china/>. Accessed on 19 June 2023.

Ellen MacArthur Foundation (2019). Plastics and the circular economy – deep dive. Available at: <https://www.ellenmacarthurfoundation.org/plastics-and-the-circular-economy-deep-dive>. Accessed on 19 June 2023.

Engao, E.L. (2024). Our story of becoming. Plastic Bank, Plastic Pollution and Recycling. Available at: <https://plasticbank.com/blog/our-story-of-becoming/>. Accessed on 17 November 2024.

Environmental Investigation Agency (2025). Thailand's plastic waste imports ban welcome but a global treaty is needed to properly tackle the issue. Available at: <https://eia-international.org/news/thailands-plastic-waste-imports-ban-welcome-but-a-global-treaty-is-needed-to-properly-tackle-the-issue/>. Accessed on 14 February 2025.

Espa, I.; Imeli, B. (2021). Restrictions to Transboundary Movements of Plastics and WTO Law: A Policy Brief. Swiss Network for International Studies (SNIS), Policy Brief. Available at: https://snis.ch/wp-content/uploads/2020/01/2019_Littoz-Monnet_Working-Paper-8.pdf. Accessed on 30 August 2025.

European Commission (2018). Questions & Answers: A European strategy for plastics. Available at https://ec.europa.eu/commission/presscorner/detail/en/MEMO_18_6. Accessed on 12 June 2023.

European Commission (2021a). Questions and Answers on new EU rules on waste shipments. Available at https://ec.europa.eu/commission/presscorner/detail/en/qanda_21_5918. Accessed on 28 July 2023.

European Environment Agency (2016). EU exporting more waste, including hazardous waste. Available at: <https://www.eea.europa.eu/highlights/eu-exporting-more-waste-including>. Accessed on 02 May 2023.

European Parliament (2025). Reducing microplastic pollution from plastic pellet losses. BRIEFING EU Legislation in Progress, p. 4. Available at: [https://www.europarl.europa.eu/RegData/etudes/BRIE/2024/760442/EPRS_BRI\(2024\)760442_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/BRIE/2024/760442/EPRS_BRI(2024)760442_EN.pdf). Accessed on 16 February 2025.

Eurostat (2022). What are the main destinations of EU export of waste? Available at: <https://ec.europa.eu/eurostat/web/products-eurostat-news/-/ddn-20220525-1>. Accessed on 17 June 2023.

Eurostat (2024a). EU exported 32 million tonnes of waste in 2022. Available at: <https://ec.europa.eu/eurostat/web/products-eurostat-news/w/ddn-20240118-1>. Accessed on 12 February 2025.

Eurostat (2024b). Trade in waste by type of material and partner. DOI: 10.2908/env_wastrdmp. Available at: https://ec.europa.eu/eurostat/databrowser/view/env_wastrdmp__custom_15346011/default?lang=en. Accessed on 12 February 2025.

FAO (2014). Natural Resources Management and the Environment in Small Island Development States (SIDS). Policy Paper. Available at: <https://sdgs.un.org/sites/default/files/publications/2241a-i3928e%20%282%29.pdf>. Accessed on 19 June 2024.

Fava, M. (2022). Ocean Plastic Pollution an Overview: Data and Statistics. UNESCO (United Nations Educational Scientific and Cultural Organization), IOC (Intergovernmental Oceanographic Commission) - Ocean Literacy Portal. Available at: <https://oceanliteracy.unesco.org/plastic-pollution-ocean/>. Accessed on 17 March 2023.

France (2013). *Une diplomatie scientifique pour la France*. Ministère des Affaires Étrangères, Rapport, p. 2. Available at: https://www.diplomatie.gouv.fr/IMG/pdf/Rapport_Complet_DiplomatieScientifique_2013_cle8a68fb.pdf. Accessed on 07 April 2024.

Fidra (2024). Why plastic pellets must be addressed in the treaty. Environmental charity supporting sustainability and preventing chemical and plastic pollution – Westgate, North Berwick, UK. Available at: https://rethinkplasticalliance.eu/wp-content/uploads/2024/11/Europe_Pellets_Primer_Final_v3.pdf. Accessed on 07 February 2025.

Friends of Ocean Action (2022). Impact pillar: building a resilient ocean – Strengthening the resilience of ocean ecosystems, economies and people. A community curated by the World Economic Forum's Ocean Action Agenda, p. 1. Available at: https://www3.weforum.org/docs/FOA_Resilient_Ocean_2021.pdf. Accessed on 17 November 2024.

G20 Brasil (2024b). Environment and Climate Sustainability, Working Group Issue Note, 2024. Available at: <https://www.g20.org/en/news/documents/g20-brazil-concept-note.pdf/@@download/file>. Accessed on 13 November 2024.

Geneva Environment Network (2022). Plastic Pollution INC-1. Update. Available at: <https://www.genevaenvironmentnetwork.org/resources/updates/towards-plastic-pollution-inc-1/>. Accessed on 17 December 2024.

Geneva Environment Network (2025). International Cooperation on Plastic Pollution | Plastics and the Environment Series. Update. Available at: <https://www.genevaenvironmentnetwork.org/resources/updates/international-cooperation-on-plastic-pollution/>. Accessed on 17 August 2025.

Grid-Arendal (2024). Climate impacts of plastics: Global actions to stem climate change and end plastic pollution. Norway. Available at: https://gridarendal-website-live.s3.amazonaws.com/production/documents/s_document/1076/original/ClimateImpactsOfPlastics.pdf?1709631241. Accessed on 10 April 2024.

GESAMP (2021). Sources, Fate and Effects of plastics and micro-plastics in the marine environment. Our work – Working Groups – WG 40: Plastics and micro-plastics. Available at: <http://www.gesamp.org/work/groups/40#:~:text=Current%20Focus%20of%20WG%2040%2C%20fourth%20phase%3A%202021%2D%20to%20present&text=The%20potential%20risks%20cover%20social,include%20risks%20to%20human%20health>. Accessed on 13 September 2023.

GESAMP (2024). History. Available at: <http://www.gesamp.org/about/history>. Accessed on 22 May 2024.

GPML (2020). What we do. Available at: <https://www.gpmarinelitter.org/what-we-do>. Accessed on 15 September 2023.

GPML (2022). Clean Seas Campaign. Available at: <https://www.gpmarinelitter.org/what-we-do/clean-seas-campaign>. Accessed on 13 August 2024.

Global Alliance for Incinerator Alternatives (2021). Plastic waste has arrived in Latin America: trends and challenges in the region. Analysis of the situation in Argentina; Mexican scenario in preparation for the implementation of the Basel Convention Plastics Amendment; Current status on the import and export of plastic waste in Chile; Heading 3915: import of waste in Ecuador. Editors: Sirine Rached, Andrés del Castillo, Magdalena Donoso Design: Paulina Veloso. Available at: <https://www.no-burn.org/wp-content/uploads/2021/11/Executive-Summary-Plastic-waste-LA-ingles-1.pdf>. Accessed on 07 February 2022.

Gravier, A.; Haut, G. (2020). Plastic Giants Polluting through the backdoor: the case for a Regulatory Supply-Chain Approach to Pellet Pollution. Rethink Plastic and Surfrider Foundation Europe. Available at: <https://www.surfrider.eu/wp-content/uploads/2020/11/report-pellet-pollution-2020.pdf>. Accessed on 12 January 2025.

HAC (2024). End Plastic Pollution by 2040. Available at: <https://hactoendplasticpollution.org/>. Accessed on 12 February 2025.

House of Commons International Development Committee (2024). The UK Small Island Developing States Strategy Fourth Report of Session 2023–24. Available at:

<https://committees.parliament.uk/publications/46218/documents/231337/default/>. Accessed on 13 June 2024.

Hege, E.; Demailly, D. (2017). How do NGOs mobilize around the SDGs and what are the ways forward? A French-German comparison. Institute for Sustainable Development and International Relations (IDDRI) Working Paper, p. 5. Available at: https://www.iddri.org/sites/default/files/import/publications/working-paper-sdgs-and-ngos_eh-dd.pdf. Accessed on 12 May 2023.

Human Rights Watch (2022). “It’s as If They’re Poisoning Us” - The Health Impacts of Plastic Recycling in Turkey. Available at: https://www.hrw.org/sites/default/files/media_2022/09/turkey0922web_0.pdf. Accessed on 17 September 2023.

IMDC (2023). International Marine Debris Conference – History of the International Marine Debris Conference (IMDC). Available at: <https://internationalmarinedebrisconference.org/>. Accessed on 12 June 2024.

IMO (2005). Resolution MEPC.132(53). Amendments to the Annex of the Protocol of 1997 to amend the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 Relating Thereto (adopted on 22 July 2005). Available at: <https://www.transport.govt.nz/assets/Uploads/Policy/OC05343-MARPOL-Annex-VI-treaty-text.pdf>. Accessed on 02 June 2022.

IOC-UNESCO (2020a). **The Science we need for the ocean we want**: the United Nations Decade of Ocean Science for Sustainable Development (2021-2030). Available at: <https://unesdoc.unesco.org/ark:/48223/pf0000265198>. Accessed on 13 March 2022.

IPCC (2019). Climate Change and Land: an IPCC special report on climate change, desertification, land degradation, sustainable land management, food security, and greenhouse gas fluxes in terrestrial ecosystems. Available at: <https://www.ipcc.ch/site/assets/uploads/2019/11/SRCCL-Full-Report-Compiled-191128.pdf>. Accessed on 02 April 2024.

IPCC (2023). Climate Change 2023: Synthesis Report. A Report of the Intergovernmental Panel on Climate Change. Contribution of Working Groups I, II and III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [Core Writing Team, H. Lee and J. Romero (eds.)]. Summary for Policymakers. IPCC, Geneva, Switzerland, p. 5-6. Available at: https://www.ipcc.ch/report/ar6/syr/downloads/report/IPCC_AR6_SYR_SPM.pdf. Accessed on 18 December 2023.

ITLOS (2015). **Advisory Opinion of 2 April 2015**. Request for an Advisory Opinion submitted by the Sub-Regional Fisheries Commission (SRFC) (request for Advisory Opinion submitted to the Tribunal) List of cases: No. 21. Available at: https://www.itlos.org/fileadmin/itlos/documents/cases/case_no.21/advisory_opinion_published/2015_21-advop-E.pdf. Accessed on 17 June 2024.

ITLOS (2024). **Advisory Opinion**. Request for an Advisory Opinion submitted by the Commission of Small Island States on Climate Change and international law. Available at:

https://www.itlos.org/fileadmin/itlos/documents/cases/31/Advisory_Opinion/C31_Adv_Op_21.05.2024_orig.pdf. Accessed on 19 August 2024.

IUCN (2023). IUCN Briefing for Negotiators – Global Plastics Treaty Inc-2 Session Legal Process of Treaty Negotiations. Available at: <https://iucn.org/sites/default/files/2023-05/legal-process-of-treaty-negotiations-final-25-may-2023.pdf>. Accessed on 12 September 2024.

IUCN (2024). Legal aspects of Financing Mechanism Options Summary under the Compilation Document (Expert Group 1). INC - Plastic Pollution Treaty Intersessional Work. Available at: <https://iucn.org/sites/default/files/2024-08/iucn-wcel-legal-brief-inc-intersessional-eg-1-financing-aug-2024-final-en.pdf>. Accessed on 20 August 2024.

IMO (2011). International Convention for the Prevention of Pollution from Ships (MARPOL). Home – About IMO – Conventions. Available at: [https://www.imo.org/en/about/Conventions/Pages/International-Convention-for-the-Prevention-of-Pollution-from-Ships-\(MARPOL\).aspx](https://www.imo.org/en/about/Conventions/Pages/International-Convention-for-the-Prevention-of-Pollution-from-Ships-(MARPOL).aspx). Accessed on 15 October 2023.

IMO (2017c). Compliance with the London Convention and Protocol. Home – Our Work – Marine Environment. Available at: <https://www.imo.org/en/OurWork/Environment/Pages/Compliance-default.aspx>. Accessed on 15 February 2023.

IMO (2024c). Prevention of Pollution by Garbage from Ships. Background of MARPOL Annex V. Available at: <https://www.imo.org/en/ourwork/environment/pages/garbage-default.aspx>. Accessed on 17 June 2024.

IMO (2024d). FAQ - Plastic pellets. Available at: <https://www.imo.org/en/MediaCentre/HotTopics/Pages/FAQ-Plastic-pellets.aspx>. Accessed on 16 December 2024.

Interpol (2020). Strategic Analysis Report: Emerging criminal trends in the global plastic waste market since January 2018. Available at: https://www.interpol.int/content/download/15587/file/INTERPOL%20Report%20_criminal%20trends-plastic%20waste.pdf. Accessed on 12 May 2023.

IOC-UNESCO (2020c). On World Oceans Day, UNESCO reinforces the importance of preserving the largest ecosystem on the planet. Available at: <https://www.unesco.org/en/articles/world-oceans-day-unesco-reinforces-importance-preserving-largest-ecosystem-planet#:~:text=Human%20actions%20have%20put%20marine,100%2C000%20marine%20mammals%20each%20year>. Accessed on 13 January 2024.

IOC-UNESCO (2023). Microplastics. Available at: <https://www.ioc.unesco.org/en/microplastics>. Accessed on 17 November 2023.

IOC; WESTPAC (2021). About the Ocean Decade. Available at: <https://ocean-decade.com/about/>. Accessed on 13 March 2022.

IPBES (2019). **Global assessment report of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services**. Brondizio, E. S., Settele, J., Díaz,

S., Ngo, H. T. (eds). IPBES Secretariat, Bonn, Germany, ISBN: 978-3-947851-20-1, p. XXVIII. Available at: [https://www.ipbes.net/system/files/2021-06/2020%20IPBES%20GLOBAL%20REPORT\(FIRST%20PART\)_V3_SINGLE.pdf](https://www.ipbes.net/system/files/2021-06/2020%20IPBES%20GLOBAL%20REPORT(FIRST%20PART)_V3_SINGLE.pdf). Accessed on 07 March 2023.

ISA (2022). The United Nations Convention on the Law of the Sea at 40. Available at: <https://www.isa.org.jm/unclos-at-40-2/#:~:text=On%2016%20November%201994%2C%20UNCLOS,the%20common%20heritage%20of%20humankind>. Accessed on 15 April 2023.

IISD (2013). Summary of the First Meeting of the High-Level Political Forum on Sustainable Development: 24 September 2013. Earth Negotiations Bulletin, vol. 33, n. 1. Published by the International Institute for Sustainable Development (IISD). Available at: <https://enb.iisd.org/events/final-session-un-csd-and-hlpf-inaugural-session/summary-report-24-september-2013>. Accessed on 12 May 2023.

IISD (2016). Summary of the seventeenth meeting of the United Nations Open-Ended Informal Consultative Process on Oceans and the Law of the Sea: 13-17 June 2016. Earth Negotiations Bulletin, vol. 25, n. 107. Published by the International Institute for Sustainable Development (IISD) – A Reporting Service for Environment and Development Negotiations, p. 12. Available at: https://s3.us-west-2.amazonaws.com/enb.iisd.org/archive/download/pdf/enb25107e.pdf?X-Amz-Content-Sha256=UNSIGNED-PAYLOAD&X-Amz-Algorithm=AWS4-HMAC-SHA256&X-Amz-Credential=AKIA6QW3YWTJ6YORWEEL%2F20250123%2Fus-west-2%2Fs3%2Faws4_request&X-Amz-Date=20250123T174425Z&X-Amz-SignedHeaders=host&X-Amz-Expires=60&X-Amz-Signature=b5cf4755a7381f42b7a5518544f212baa69674d63c1c60e18f2e07ddd3b48800. Accessed on 12 March 2024.

IISD (2017). Summary of the Ocean Conference: 5-9 June 2017. Earth Negotiations Bulletin A Reporting Service for Environment and Development Negotiations, vol. 32, n. 33. Available at: <https://enb.iisd.org/download/pdf/enb3233e.pdf>. Accessed on 17 January 2023.

James, G. (2019). The Plastics Landscape: The Challenges and Possible Solutions. Principles for Responsible Investment (PRI), report, p. 5. Available at: <https://www.unpri.org/download?ac=7014>. Accessed on 12 June 2023.

Jarvie, M. E. (2016). **Brundtland Report**. Encyclopedia Britannica. Available at: <https://www.britannica.com/topic/Brundtland-Report>. Accessed on 13 April 2022.

Kar, J.,; *et. al.* (2024). Extended producer responsibility and a global plastics treaty – what do the experts say? World Economic Forum – Circular Economy (Centre for Nature and Climate). Available at: <https://www.weforum.org/stories/2024/11/extended-producer-responsibility-global-plastics-treaty-experts/>. Accessed on 20 February 2025.

Karali, N.; *et. al.* (2024). Climate Impact of Primary Plastic Production. Available at: https://eta-publications.lbl.gov/sites/default/files/2024-09/climate_and_plastic_report_lbnl-2001585.pdf. Accessed on 16 May 2024.

Leitão, A.I.B.L.S.; Mont’Alverne, T.C.F. (2022). The development of an International Regime for Marine Plastic Pollution: fulfilling legal gaps to strengthen Ocean

Resilience. TS-5.10: Turning Off the Tap - The Road to an Effective Global Plastics Treaty. Available at: <https://7imdc.exordo.com/programme/presentation/516>. Accessed on 13 January 2025.

Lumpur, K. (2021). Malaysia sends back over 300 containers of illicit plastic waste. Reuters, World. Available at: <https://www.reuters.com/article/world/malaysia-sends-back-over-300-containers-of-illicit-plastic-waste-idUSKBN2BT29H/>. Accessed on 17 June 2023.

Mead, L. (2021). Small Islands, Large Oceans: Voices on the Frontlines of Climate Change. Earth Negotiations Bulletin, Brief n. 15, p. 4. Available at: <https://www.iisd.org/system/files/2021-03/still-one-earth-SIDS.pdf>. Accessed on 13 June 2024.

MoEFCC (2023). **G20 Report on Actions Against Marine Plastic Litter**. Fifth Information Sharing Based on the G20 Implementation Framework. Ministry of Environment, Forest and Climate Change, New Delhi, India. 1st Edition. 575 pp. Available at: https://g20mpl.org/wp-content/uploads/2023/07/MPL-report-_2023.pdf. Accessed on 02 March 2023.

McKinsey Center for Business and Environment (2015). Europe's circular-economy opportunity. Available at: <https://www.mckinsey.com/~media/McKinsey/Business%20Functions/Sustainability/Our%20Insights/Europes%20circular%20economy%20opportunity/Europes%20circular%20economy%20opportunity.ashx>. Accessed on 19 June 2023.

Mead, L. (2021). **The “Crown Jewels” of Environmental Diplomacy**: Assessing the UNEP Regional Seas Programme. International Institute for Sustainable Development – Earth Negotiations Bulletin, Brief #17, p. 5. Available at: <https://www.iisd.org/system/files/2021-04/still-one-earth-regional-seas.pdf>. Accessed on 13 April 2024.

Merkel, A.; Charles, D. (2022). **The Price of Plastic Pollution**: Social Costs and Corporate Liabilities. Minderoo Foundation, p. 11. Available at: <https://cdn.minderoo.org/content/uploads/2022/10/14130457/The-Price-of-Plastic-Pollution.pdf>. Accessed on 13 December 2023.

NFWF (2020). Marine Mammal Commission. The National Fish and Wildlife Foundation (NFWF) – Federal & State Partners. Available at: <https://www.nfwf.org/partnerships/federal-state-partners/marine-mammal-commission>. Accessed on 17 September 2024.

National Aeronautics and Space Administration (2024). The Ocean and Climate Change. Available at: <https://science.nasa.gov/earth/explore/the-ocean-and-climate-change/>. Accessed on 16 October 2024.

Ocean Conservancy; McKinsey Center for Business and Environment (2015). **Stemming the Tide: Land based Strategies for a Plastic-free Ocean**. Available at: <https://oceanconservancy.org/wp-content/uploads/2017/04/2015-Ocean-Conservancy-ICC-Report.pdf>. Accessed on 16 March 2024.

Ocean Pavilion (2024). COP29 Baku Ocean Declaration. Available at: <https://oceanpavilion-cop.org/baku-ocean-declaration/>. Accessed on 22 December 2024.

OECD (2016). **The Ocean Economy in 2030**. OECD Publishing, Paris. DOI: <http://dx.doi.org/10.1787/9789264251724-en>. ISBN 978-92-64-25172-4 (PDF). Available at: <https://www.oecd.org/environment/the-ocean-economy-in-2030-9789264251724-en.htm>. Accessed on 22 December 2021.

OECD (2022b). **Deposit-refund systems and the interplay with additional mandatory extended producer responsibility policies**. OECD Environment Working Papers No. 208. DOI: <https://dx.doi.org/10.1787/a80f4b26-en>. Available at: https://www.oecd.org/content/dam/oecd/en/publications/reports/2022/12/deposit-refund-systems-and-the-interplay-with-additional-mandatory-extended-producer-responsibility-policies_c92a063b/a80f4b26-en.pdf. Accessed on 13 January 2023.

OECD (2023). Climate change and plastics pollution: Synergies between two crucial environmental challenges. Policy Highlights. Available at: <https://www.oecd.org/environment/plastics/Policy-Highlights-Climate-change-and-plastics-pollution-Synergies-between-two-crucial-environmental-challenges.pdf>. Accessed on 27 March 2024.

Organisation Météorologique Mondiale (2023). *Unis autour de la science 2023*. Coordination d'ensemble et édition par l'OMM: Lauren Stuart, Jürg Luterbacher, Roseline Devillier, Laura Paterson, Kate Solazzo et Isha Bhasin, Genève, Suisse, p. 3. Available at: <https://www.unep.org/fr/resources/rapport/unis-autour-de-la-science-2023>. Accessed on 13 April 2024.

Odindo, N. (2025). Nairobi: Pain as 2 Workers Suffocate to Death at Plastic Recycling Company. Available at: <https://www.tuko.co.ke/kenya/counties/574303-nairobi-pain-2-workers-suffocate-death-plastic-recycling-company/>. Accessed on 14 February 2025.

Ocean Health Index (2024a). Ocean Health Index. Available at: <https://www.oceanhealthindex.org/>. Accessed on 29 November 2024.

Ocean Health Index (2024b). Guidance: Clean Waters. Available at: <https://oceanhealthindex.org/guidance/clean-waters/>. Accessed on 29 November 2024.

O'Hare, P.; *et. al.* (2023). Policy Brief: Towards a Just Transition Away from Plastic Pollution. Zenodo. DOI: <https://doi.org/10.5281/zenodo.10021005>. Available at: https://pure.manchester.ac.uk/ws/portalfiles/portal/279651360/SCEPT_Policy_Brief_Just_Transition_en.pdf. Accessed on 13 January 2024.

Parker, L. (2020). An old-school plan to fight plastic pollution gathers steam. National Geographic. Available at: <https://www.nationalgeographic.com/science/article/old-school-plan-to-fight-plastic-pollution-gathers-steam>. Accessed on 05 June 2023.

PepsiCo (2024). Packaging. Available at: <https://www.pepsico.com/our-impact/esg-topics-a-z/packaging#approach>. Accessed on 11 December 2024.

Plastic Soup Foundation (2024). Beat the Microbead App. Available at: <https://www.beatthemicrobead.org/impact/tools/>. Accessed on 13 November 2024.

Plastics Europe (2023). Chemical recycling. Available at: <https://plasticseurope.org/sustainability/circularity/recycling/chemical-recycling/>. Accessed on 06 December 2023.

Pisano, U.; Endl, A.; Berger, G. (2012). The Rio+20 Conference 2012: Objectives, processes and outcomes. European Sustainable Development Network (ESDN) Quarterly Report N°25. Available at: https://www.esdn.eu/fileadmin/ESDN_Reports/2012-June-The_Rio_20_Conference_2012.pdf. Accessed on 8 April 2023.

Plastics Europe (2022). Plastics – the Facts 2022. Belgium: Brussels, p. 28. Available at: https://plasticseurope.org/wp-content/uploads/2022/10/PE-PLASTICS-THE-FACTS_V7-Tue_19-10-1.pdf. Accessed on 19 June 2023.

Pew Charitable Trusts; Systemiq (2020). Breaking the Plastic Wave: A Comprehensive Assessment of Pathways Towards Stopping Ocean Plastic Pollution. Full report, p. 9. Available at: https://www.pewtrusts.org/-/media/assets/2020/07/breakingtheplasticwave_report.pdf. Accessed on 05 January 2022.

Pörtner, H.O.; *et al.* (2019). The ocean and cryosphere in a changing climate. In: IPCC Special Report on the Ocean and Cryosphere in a Changing Climate, 1155. Available at: https://www.ipcc.ch/site/assets/uploads/sites/3/2019/12/SROCC_FullReport_FINAL.pdf. Accessed on 16 July 2024.

Raubenheimer, K.; Urho, N. (2020). Possible elements of a new global agreement to prevent plastic pollution. Nordic Council of Ministers, Denmark, Copenhagen, p. 66. Available at: <http://norden.diva-portal.org/smash/get/diva2:1477124/FULLTEXT02.pdf>. Accessed on 12 November 2024.

Rubio-Domingo, G.; Halev, A. (2022). Making Plastics Emissions Transparent. Coalition on Materials Emissions Transparency (COMET). Available at: <https://ccsi.columbia.edu/sites/default/files/content/COMET-making-plastics-emissions-transparent.pdf>. Accessed on 29 March 2024.

Rethink Plastic (2024). Regulation on Plastic Pellet pollution: Council of the EU adopts its General Approach. Available at: <https://rethinkplasticalliance.eu/news/regulation-on-plastic-pellet-pollution-the-european-council-adopts-its-general-approach/>. Accessed on 22 December 2024.

SBC (2011). The Convention Overview. United Nations Environment Programme. Available at: <https://www.basel.int/TheConvention/Overview/tabid/1271/Default.aspx>. Accessed on 09 December 2024.

SBC (2021). “Overview”. Basel Convention – Implementation – Plastic waste – Plastic Waste –Partnership. Available at: <https://www.basel.int/Implementation/Plasticwaste/PlasticWastePartnership/tabid/8096/Default.aspx>. Accessed on 18 November 2024.

SBC (2021). Plastic Waste – Overview. Actions for addressing plastic waste under the Basel Convention, Secretariat of the Basel Convention. Available at:

<http://www.basel.int/Implementation/Plasticwaste/Overview/tabid/8347/Default.aspx>. Accessed on 17 November 2024.

SBC (2021). Questions and answers related to the Basel Convention Plastic Waste Amendments. Basel Convention – Implementation – Plastic waste – Amendments. Available at:

<http://www.basel.int/Implementation/Plasticwaste/PlasticWasteAmendments/FAQs/tabid/8427/Default.aspx>. Accessed on 18 November 2024.

S4D4C (2019). The Madrid Declaration on Science Diplomacy. Using Science In/For Diplomacy for Addressing Global Challenges. Available at: <https://www.s4d4c.eu/s4d4c-1st-global-meeting/the-madrid-declaration-on-science-diplomacy/>. Accessed on 03 May 2024.

Sabin Center For Climate Change Law (2024). Request for an Advisory Opinion submitted by the Commission of Small Island States on Climate Change and International Law. Available at: <https://climatecasechart.com/non-us-case/18416/>. Accessed on 17 August 2024.

Scanlon, J.; Burhenne-Guilmin, F. (2004). International Environmental Governance: An International Regime for Protected Areas. IUCN Environmental Policy and Law Paper No. 49, p. 2. IUCN Environmental Law Programme. ISBN 2-8317-0768-4. Available at: <https://portals.iucn.org/library/efiles/documents/EPLP-049.pdf>. Accessed on 13 May 2022.

Simon, N.; *et al.* (2018). No more Plastics in the Ocean - Gaps in Global Plastic Governance and Options for a Legally Binding Agreement to Eliminate Marine Plastic Pollution. Draft report for WWF to support discussions at the Ad Hoc Open-ended Expert Group on Marine Litter and Microplastics. Berlin: adelphi. Available at: <https://www.ecologic.eu/16131>. Accessed on 07 February 2022.

Secretariat of the Rotterdam Convention (2024). Status of ratifications. Rotterdam Convention – Countries – Status of ratification – Parties and Signatories. Available at: <https://www.pic.int/Countries/Statusofratification/PartiesandSignatories/tabid/1072/language/en-US/Default.aspx>. Accessed on 12 November 2024.

Secretariat of the Stockholm Convention (2004). History of the negotiations of the Stockholm Convention. Stockholm Convention – The Convention – Overview – History – Overview. Available at: <https://chm.pops.int/TheConvention/Overview/History/Overview/tabid/3549/Default.aspx>. Accessed on 13 February 2023.

Secretariat of the Stockholm Convention (2024). Status of ratification. Stockholm Convention – Countries – Status of Ratifications – Parties and Signatoires. Available at: <https://chm.pops.int/Countries/StatusofRatifications/PartiesandSignatoires/tabid/4500/Default.aspx>. Accessed on 02 August 2024.

Statista (2024). Main destinations for plastic waste exports from the European Union (EU-27) in 2023, by country. Available at: <https://www.statista.com/statistics/1269996/plastic-waste-export-destinations-european-union/>. Accessed on 18 October 2024.

Tekman, M.B.; *et al.* (2022): Impacts of plastic pollution in the oceans on marine species, biodiversity and ecosystems. WWF Germany, Berlin. ISBN 978-3-946211-46-4. DOI: 10.5281/zenodo.5898684. Available at: https://wwfint.awsassets.panda.org/downloads/wwf_impacts_of_plastic_pollution_on_biodiversity.pdf. Accessed on 14 July 2023.

Ten Brink, P.; *et al.* (2009). Guidelines on the Use of Market-based Instruments to Address the Problem of Marine Litter. Institute for European Environmental Policy (IEEP), Brussels, Belgium, and Sheavly Consultants, Virginia Beach, Virginia, USA. 60 pp. Printed in Nairobi by the United Nations Environment Programme. Available at: https://ieep.eu/wp-content/uploads/2009/04/Economic_Instruments_and_Marine_Litter.pdf. Accessed on 13 January 2024.

The Coca-Cola Company (2021). Packaging solutions. Available at: <https://www.coca-colacompany.com/sustainability/packaging#:~:text=Design,to%2035%25%20globally%20by%2035>. Accessed on 12 January 2025.

The Geneva Association (2021). Climate Change Litigation – Insights into the evolving global landscape. Authors: Maryam Golnaraghi, Joana Setzer, Nigel Brooke, Wynne Lawrence and Lucia Williams, 44p. Available at: <https://www.genevaassociation.org/research-topics/climate-change-and-emerging-environmental-topics/climate-litigation>. Accessed on 13 December 2024.

The Guarini Center; State Impact Center (2022). Plastics Litigation Tracker – Description of Categories. Available at: <https://stateimpactcenter.org/files/Description-of-Categories.pdf>. Accessed on 11 December 2024.

The Guarini Center; State Impact Center (2025a). Plastics Litigation Tracker. The People of the State of California v. Pepsico, Inc., *et al.*, No. 2:24-cv-10340 (C.D. Cal. removed 2024) [Previously: The People of the State of California v. Pepsico, Inc., *et al.*, No. 24STCV28450 (Cal. Super. Ct. filed 2024)]. Available at: <https://plasticslitigationtracker.org/>. Accessed on 17 August 2025.

The Guarini Center; State Impact Center (2025b). Plastics Litigation Tracker. Rodriguez *et al.* v. Exxon Mobil Corporation *et al.*, No. 4:24-cv-00803 (W.D. Mo. filed 2024). Available at: <https://plasticslitigationtracker.org/>. Accessed on 17 August 2025.

The World Bank (2022). Squaring the Circle: Policies from Europe's Circular Economy Transition. 1st Edition. Washington DC: World Bank Publications, p. 51. Available at: <https://www.worldbank.org/en/region/eca/publication/squaring-circle-europe-circular-economy-transition>. Accessed on 12 July 2023.

Urho, N. (2021). Commitment Platforms and the Global Agenda for Chemicals and Waste Management. Center for Governance and Sustainability, University of Massachusetts Boston, p. 31. Available at: https://xn--789c2bcb-2f104a1b-9807566a4b86a576-n74uja.filesusr.com/ugd/27be4e_5662a7e51e8f4247903b52f425ed7714.pdf. Accessed on 13 October 2024.

UN (2000). Millennium Summit, 6-8 September 2000, New York. Background – Development goals for a new millennium. Available at:

<https://www.un.org/en/conferences/environment/newyork2000>. Accessed on 13 May 2023.

UN (2010). Remarks to Member States on “Keeping the Promise: a Forward-looking Review to Promote and Agreed Action Agenda to Achieve the MDGs by 2015”. Speech given by Secretary General Ban Ki-moon, General Assembly, 16 March 2010. Available at: <https://www.un.org/sg/en/content/sg/speeches/2010-03-16/remarks-member-states-keeping-promise-forward-looking-review-promote>. Accessed on 21 May 2023.

UN (2015a). Goal 14 – Conserve and sustainably use the oceans, seas and marine resources for sustainable development. Targets and indicators. Available at: https://sdgs.un.org/goals/goal14#targets_and_indicators. Accessed on 17 August 2024.

UN (2015b). United Nations Summit on Sustainable Development, 25-27 September 2015, New York. Available at: <https://www.un.org/en/conferences/environment/newyork2015>. Accessed on 02 May 2023.

UN (2017b). United Nations Conference to Support the Implementation of Sustainable Development Goal 14. 5-9 June 2017, New York. Available at: <https://sustainabledevelopment.un.org/index.php?menu=3280>. Accessed on 13 June 2023.

UN (2017c). Our Ocean, Our Future: Call for Action. Available at: <https://sustainabledevelopment.un.org/frameworks/ouroceanourfuture>. Accessed on 12 January 2023.

UN (2017d). Peter Thomson, UN Secretary-General’s Special Envoy for the Ocean. Available at: <https://sdgs.un.org/topics/oceans-and-seas/SpecialEnvoy>. Accessed on 13 March 2023.

UN (2022c). Guterres outlines four recommendations to help us all ‘Save Our Ocean’. UN News. Available at: <https://www.un.org/tr/desa/guterres-outlines-four-recommendations-help-us-all-save-our-ocean#:~:text=sustainable%20ocean%20economies-Mr.,of%20any%20of%20the%20SDGs>. Accessed on 16 June 2023.

UN (2022d). With Marine Pollution at ‘Alarming’ Levels, Speakers at Ocean Conference Dialogue Demand Urgent Action to Clean World’s Seas, Call for Political Will. Meetings Coverage and Press Releases: UN Ocean Conference, Interactive Dialogue 1 (PM) – SEA/2144, 27 June 2022. Available at: <https://press.un.org/en/2022/sea2144.doc.htm>. Accessed on 18 November 2022.

UN (2024a). Chronological lists of ratifications of, accessions and successions to the Convention and the related Agreements. Oceans & Law of the Sea – Division for Ocean Affairs and the Law of the Sea. Available at: https://www.un.org/depts/los/reference_files/chronological_lists_of_ratifications.htm#The%20United%20Nations%20Convention%20on%20the%20Law%20of%20the%20Sea. Accessed on 18 October 2024.

UN (2024b). Secretariat of the Convention on the Conservation of Migratory Species of Wild Animals (UNEP/CMS). Available at: <https://unric.org/en/unep-cms/>. Accessed on 16 November 2024.

UN (2024c). Regional Seas Programme. Division of Environmental Policy Implementation. Available at: <https://sdgs.un.org/partnerships/regional-seas-programme>. Accessed on 18 February 2024.

UN Sustainable Development Group (2024). Ambitious commitments mark the end of Brazil's G20 Presidency. Available at: <https://unsdg.un.org/latest/stories/ambitious-commitments-mark-end-brazils-g20-presidency>. Accessed on 21 December 2024.

UN Treaty Collection (2024a). 12. Convention on the Law of the Non-Navigational Uses of International Watercourses. New York, 21 May 1997 – Status. Available at: https://treaties.un.org/pages/viewdetails.aspx?src=treaty&mtdsg_no=xxvii-12&chapter=27&clang=_en. Accessed on 12 December 2024.

UN Treaty Collection (2024b). 3. Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal. Basel, 22 March 1989. Available at: https://treaties.un.org/pages/viewdetails.aspx?src=treaty&mtdsg_no=xxvii-3&chapter=27&clang=_en. Accessed on 18 November 2024.

UN Treaty Collection (2024c). 5. Convention on the Protection and Use of Transboundary Watercourses and International Lakes. Helsinki, 17 March 1992 – Status. Available at: https://treaties.un.org/pages/viewdetails.aspx?src=treaty&mtdsg_no=xxvii-5&chapter=27&clang=_en. Accessed on 12 December 2024.

UN Treaty Collection (2024d). 6. United Nations Convention on The Law of The Sea. Montego Bay, 10 December 1982. United Nations, Treaty Series, vol. 1833, p. 3; depositary notifications C.N.236.1984. Available at: https://treaties.un.org/pages/ViewDetailsIII.aspx?src=TREATY&mtdsg_no=XXI-6&chapter=21&Temp=mtdsg3&clang=_en. Accessed on 17 November 2024.

UNCTAD (2022). Global plastics trade hits record \$1.2 trillion. Available at: <https://unctad.org/data-visualization/global-plastics-trade-reached-nearly-1.2-trillion-2021>. Accessed on 17 October 2024.

UNCTAD (2024). Making trade work better for the planet. Available at: <https://unctad.org/news/making-trade-work-better-planet>. Accessed on 17 October 2024.

UNDP (2015). Background on the goals. Sustainable Development Goals. Available at: <https://www.undp.org/sdg-accelerator/background-goals>. Accessed on 3 April 2023.

UNECE (2023). About the Water Convention. Available at: <https://unece.org/environment-policy/water/about-the-convention/introduction>. Accessed on 13 November 2024.

UNEP (2011c). 5th International Marine Debris Conference. 20-25 March 2011, Hawaii. Available at: <https://www.unep.org/nowpap/news-and-stories/story/5th-international-marine-debris-conference>. Accessed on 17 October 2022.

UNEP (2018d). 6th International Marine Debris Conference. San Diego, CA, 12-16th March 2018. Available at: <https://www.unep.org/nowpap/news-and-stories/story/6th-international-marine-debris-conference>. Accessed on 13 November 2022.

UNEP (2019e). Megadiverse Brazil: giving biodiversity an online boost. Available at: <https://www.unep.org/news-and-stories/story/megadiverse-brazil-giving-biodiversity-online-boost#:~:text=Brazil%20is%20at%20the%20top,more%20than%204%2C000%20plant%20species>. Accessed on 20 May 2023.

UNEP (2020d). SAICM Knowledge – Safer use of chemicals can help protect biodiversity. Available at: <https://saicmknowledge.org/library/safer-use-chemicals-can-help-protect-biodiversity>. Accessed on 19 September 2023.

UNEP (2021). XXII Forum of Ministers of Environment of Latin America and the Caribbean. Available at: <https://www.unep.org/events/unep-event/xxii-forum-ministers-environment-latin-america-and-caribbean>. Accessed on 03 July 2023.

UNEP (2022g). The 7th International Marine Debris Conference (7IMDC). 18 - 23 September 2022, Busan, Republic of Korea. Available at: <https://www.unep.org/events/unep-event/7th-international-marine-debris-conference-7imdc>. Accessed on 19 November 2023.

UNEP (2023d). Global Framework on Chemicals – For a Planet Free of Harm from Chemicals and Waste. Available at: https://wedocs.unep.org/bitstream/handle/20.500.11822/46685/global_framework_chemicals_Planet_EN.pdf?sequence=1&isAllowed=y. Accessed on 12 December 2024.

UNEP (2023h). Second Session (INC-2): Pre-session submissions. Available at: <https://www.unep.org/inc-plastic-pollution/session-2/submissions#Members>. Accessed on 18 January 2024.

UNEP (2024b). Information on the work carried out within the framework of the Basel, Rotterdam and Stockholm conventions as it relates to the sixth session of the United Nations Environment Assembly. Available at: <https://documents.un.org/doc/undoc/gen/k24/003/41/pdf/k2400341.pdf>. Accessed on 14 November 2024.

UNEP; GPA (2016). Global Partnership on Marine Litter. Available at: <https://www.sprep.org/attachments/VirLib/Global/partnership-marine-litter.pdf>. Accessed on 18 September 2023.

UNEP; NOAA (2018). Sixth International Marine Debris Conference – Conference Proceedings. March 12-16, 2018 San Diego, California, USA. Available at: https://internationalmarinedebrisconference.org/wp-content/uploads/2018/06/Sixth_International_Marine_Debris_Conference_Proceedings.pdf. Accessed on 17 November 2022.

UNEP; SAICM (2019a). Strategic Approach to International Chemicals Management. About – Overview. Available at:

<https://www.saicm.org/About/Overview/tabid/5522/language/en-US/Default.aspx>. Accessed on 22 September 2024.

UN Millennium Project (2005). Who's got the power? Transforming health systems for women and children. Task Force on Child Health and Maternal Health – Achieving the Millennium Development Goals. Available at: <https://digitallibrary.un.org/record/556101?ln=en>. Accessed on 17 May 2023.

UNFCCC (2021a). Shifting to a Circular Economy Essential to Achieving Paris Agreement Goals. UN Climate Change News, 15 April. Available at: <https://unfccc.int/news/shifting-to-a-circular-economy-essential-to-achieving-paris-agreement-goals>. Accessed on 07 March 2022.

UNOC (2025a). Third United Nations Ocean Conference Nice 2025. Available at: <https://unocnice2025.org/en/>. Accessed on 30 January 2025.

UN Task Team (2012). **Realizing the Future We Want for All**: Report to the Secretary-General. UN System Task Team on the Post-2015 UN Development Agenda, New York, June 2012, p. 22. Available at: https://www.un.org/en/development/desa/policy/untaskteam_undf/untt_report.pdf. Accessed on 12 April 2023.

UN (2025a). Nice Conference Adopts Declaration Underscoring Vital Importance of Ocean to Life on Our Planet, Essential Role in Mitigating Climate Change. UN Ocean Conference, 8th Meeting (PM). 13 June 2025. Meetings Coverage and Press Releases. Available at: <https://press.un.org/en/2025/sea2231.doc.htm>. Accessed on 09 August 2025.

UN (2025c). UN Ocean Conference delivers unified call to action and strong commitments. Available at: <https://www.un.org/en/desa-en/UNOC3-delivers-unified-call-to-action>. Accessed on 11 August 2025.

UNESCO (2016). UNESCO receives 2016 Science Diplomacy Award. News, 2016. Available at: <https://www.unesco.org/en/articles/unesco-receives-2016-science-diplomacy-award>. Accessed on 09 May 2024.

UNFCCC (2021b). Healthy Oceans Vital to Achieving a Low-carbon and Resilient World. UN Climate Change News, 8 June 2021. Available at: <https://unfccc.int/news/healthy-oceans-vital-to-achieving-a-low-carbon-and-resilient-world>. Accessed on 02 April 2024.

UNFCCC (2023a). First global stocktake Proposal by the President Draft decision - /CMA.5 Outcome of the first global stocktake. FCCC/PA/CMA/2023/L.17. Available at: https://unfccc.int/sites/default/files/resource/cma2023_L17_adv.pdf. Accessed on 13 May 2024.

UNFCCC (2023b). Long-term low-emission development strategies. Synthesis report by the secretariat (FCCC/PA/CMA/2023/10). Available at: <https://unfccc.int/documents/632339>. Accessed on 12 May 2024.

UNFCCC (2024). Preparing for the Enhanced Transparency Framework. Available at: <https://unfccc.int/process-and-meetings/transparency-and-reporting/preparing-for-the-ETF>. Accessed on 17 August 2024.

United Arab Emirates (2023). Accelerating action towards a green, inclusive and resilient Economy. Third Update of Second Nationally Determined Contribution for the UAE. Available at: https://unfccc.int/sites/default/files/NDC/2023-07/Third%20Update%20of%20Second%20NDC%20for%20the%20UAE_v15.pdf. Accessed on 19 March 2024.

Vibhu, M. (2024). Plastic pollution treaty negotiations adjourn in Busan, to resume next year. United Nations, UN News, Climate and Environment. Available at: <https://news.un.org/en/story/2024/12/1157646>. Accessed on 07 December 2024.

Vihma, A. (2014). How to reform the UN climate negotiations? Perspectives from the past, present and neighbour negotiations. 82 FIIA Working Paper, p. 11. The Finnish Institute of International Affairs. Available at: <https://www.files.ethz.ch/isn/184844/wp82.pdf>. Accessed on 15 June 2023.

Vinson & Elkins (2024). 2024 Chemicals & Energy Antitrust Report. Available at: <https://media.velaw.com/wp-content/uploads/2025/01/16164925/Annual-Energy-Chemical-Antitrust-Report.pdf>. Accessed on 23 January 2025.

Volcovici, V. (2022). Countries split on plastics treaty focus as U.N. talks close. **Reuters**, Environment, December 3, 2022. Available at: <https://www.reuters.com/business/environment/countries-split-plastics-treaty-focus-un-talks-close-2022-12-03/>. Accessed on 12 January 2023.

WCO (2023). World Environment Day - Fighting environmental crime remains a key priority for the WCO. Available at: <https://www.wcoomd.org/en/media/newsroom/2023/june/world-environment-day.aspx?p=1>. Accessed on 12 November 2024.

Williams, M.; *et al.* (2019). No time to waste – Tackling the plastic pollution crisis before it's too late. A report by Tearfund, Fauna & Flora International (FFI), WasteAid and The Institute of Development Studies (IDS). Available at: https://wasteaid.org/wp-content/uploads/2019/05/NO_TIM2.pdf. Accessed on 13 January 2022.

Woodbridge, M. (2015). From MDGs to SDGs: What are the Sustainable Development Goals? ICLEI BRIEFING SHEET - Urban Issues, No. 01. Available at: <https://www.local2030.org/library/251/From-MDGs-to-SDGs-What-are-the-Sustainable-Development-Goals.pdf>. Accessed on 18 May 2023.

WTO (2024). Aid for Trade. Available at: https://www.wto.org/english/tratop_e/devel_e/a4t_e/aid4trade_e.htm. Accessed on 06 December 2024.

WWF (2023). Who Pays for Plastic Pollution? Enabling global equity in the plastic value chain – towards a treaty to end plastic pollution. The report has been commissioned by WWF and produced by Dalberg Research & Consulting, with additional insight from WWF's plastics team, p. 4. Available at:

<https://wwfint.awsassets.panda.org/downloads/wwf-report---who-pays-for-plastic-pollution.pdf>. Accessed on 12 January 2024.

Youngman, A. (2024). Tackling sea-based sources of plastic pollution at the International Maritime Organisation. Environmental Investigation Agency, Legal and Policy Specialist. Available at: <https://eia-international.org/blog/tackling-sea-based-sources-of-plastic-pollution-at-the-international-maritime-organisation/>. Accessed on 17 December 2024.

ANNEX A

Table 9 – Provisions on Plastics in the NDCs

No.	COUNTRY	PROVISIONS ON PLASTICS IN THE NDC	ANALYSIS
1	Albania	“There are established waste recycling industries in the country, mainly for plastics and metals”; “ Plastic waste accounts for more than 90 per cent of the total solid waste found on beaches”.	Identifies plastics only as a type of waste/pollutant.
2	Bahamas	“Environmental Protection Act (...) to prohibit single-use plastic food utensils and non-biodegradable, oxo-biodegradable and biodegradable single-use plastic bags ; (...) to regulate the use of compostable single-use plastic bags and for related matters.”	Identifies plastics only as a type of waste/pollutant.
3	Cape Verde	“Moving towards responsible tourism and the circular economy (contribution to mitigation): The roadmap will set targets for the local contribution to reducing GHG emissions, per visitor/day by 2030, through rigorous reuse and recycling, banning single-use plastic. ”	Although it recognises GHG emissions, it only lists plastics as a type of waste/pollutant.
4	Cambodia	“Mitigation action: implementation of the national 3R Strategy (...) GHG mitigation potential: GHG reduction due to a reduction in the amount of plastic waste generated and burnt. ”	It links plastics and GHG emissions (although it still doesn't consider the entire life cycle of plastics).
5	Cameroon	“ Plastic recycling on the list of mitigation measures”.	Identifies plastics only as a type of waste/pollutant.
6	Colombia	“Recycling: implementation in the paper, cardboard and plastics fraction from 2020: 10 per cent, 2021: 13 per cent, 2022: 15 per cent, constant 15 per cent until 2030.”	Identifies plastics only as a type of waste/pollutant.
7	Republic of Congo	“Planning the management of special waste (plastics , electronic waste, bulky items, mines, etc.)”.	Identifies plastics only as a type of waste/pollutant.
8	Dominica	“Solid waste: significant improvements in waste management, particularly in home and backyard composting, separation at source and the reduction and recycling of plastics , will drastically reduce the amount of waste transported to landfills.”	Identifies plastics only as a type of waste/pollutant.
9	Egypt	“To prevent the accumulation of plastic waste in the marine and terrestrial environment and increase the production of green petrochemicals,	Identifies plastics only as a type of waste/pollutant.

		two programmes are planned. The first programme would manufacture 75,000 tonnes of biodegradable plastic bags annually . The second programme aims to convert plastic waste into oil as an intermediate product for the production of 30,000 tonnes of polyethylene.”	Furthermore, the programme to manufacture tonnes of biodegradable plastic bags is controversial.
10	Fiji	“Fiji introduced a ban on single-use plastic from 1 January 2020, which implies a ban on the import, manufacture, distribution and use of single-use plastic bags.”	Identifies plastics only as a type of waste/pollutant.
11	Haiti	“Sectoral mitigation measures and socio-economic benefits (...) Plastics recycling. ”	Identifies plastics only as a type of waste/pollutant.
12	Indonesia	“Improving the control of coastal zone and ocean pollution, including marine litter and plastic debris. ”	Identifies plastics only as a type of waste/pollutant.
13	Iraq	“Recycling and waste management, such as projects to recycle heat and gases emitted by industrial furnaces and the recycling of plastic and tyres.”	Identifies plastics only as a type of waste/pollutant.
14	Jamaica	“Jamaica has introduced a ban on single-use plastics . Since the beginning of 2019, the government has imposed a ban on the import, manufacture, distribution and use of single-use plastic bags (of certain sizes), as well as plastic straws . (...) The ban is complemented by a Plastic Waste Minimisation project. ”	Identifies plastics only as a type of waste/pollutant.
15	Macedonia	“The benefits of the Circular Economy in reducing GHG emissions are analysed with the aim of identifying opportunities and challenges for mitigation through the advancement of circular practices in the waste management sector. Six case studies were selected, including: construction and demolition waste; bio-waste; secondary waste fuels; e-waste; end-of-life vehicles; and plastics. ”	Although it recognises GHG emissions, it only lists plastics as a type of waste/pollutant.
16	Maldives	“(…) this NDC would also facilitate action to realise the government's visions for a 'Blue Economy', promoting sustainable economic growth while safeguarding our oceans, with plans to phase out single-use plastics and (...) implement measures to reduce sources of pollution to coral reefs and ecosystems (...) taking into account the phasing out of single-use plastics. ”	Identifies plastics only as a type of waste/pollutant.

17	Mali	“ Plastic waste recycling project in the city of Bamako at industrial level; plastic waste recovery and transformation project in Commune V of the Bamako District; (...) in addition, several Malian companies, sensitive to the environment and climate change, have already become involved in ecological dynamics, particularly in the areas of: (...) plastic waste transformation and (...) integrated programme for the collection and transformation of urban plastic waste at industrial level (...).”	Identifies plastics only as a type of waste/pollutant.
18	Mauritania	“The plastic recycling process includes washing and granulation. This technique is already present and (...) with greater international support, plastic recycling could reach 4,000 tonnes/year by 2030.”	Identifies plastics only as a type of waste/pollutant.
19	Monaco	“Since 2016, the Principality has implemented an ambitious strategy to limit the amount of waste produced and prioritise waste for material recovery. This strategy has been complemented by a ' zero single-use plastic waste by 2030 ' policy. In terms of reducing greenhouse gas emissions, Monaco's priority in this area concerns the reduction of plastic waste, the incineration of which accounts for the majority of emissions in this sector. ”	It links plastics and GHG emissions (although it still doesn't consider the entire life cycle of plastics).
20	Nauru	“The volume of waste stored in the landfill can be significantly reduced by building a new resource recovery facility for inorganic waste. Recoverable materials include surplus tyres, unwanted white goods, scrap steel, aluminium containers and recycled plastics . (...) The collection of plastic drinks containers for export and recycling is also worth considering, although measures are also being taken to minimise the use of plastics. ”	Identifies plastics only as a type of waste/pollutant.
21	Nigeria	“A study was conducted in 2021 to inform the NDC update, analysing the impact of the circular economy (CE) on Nigeria's waste management sector. The result of the review of the CE policy and institutional landscape showed that Nigerian legislation related to waste management has incorporated circular economy procedures into policies such as the National Policy on Plastic Waste Management (2020) and the National Policy on the Environment (2016).”	Identifies plastics only as a type of waste/pollutant.

22	Pakistan	“Mitigation Policy Action in Six Sectors - Policy Initiatives - Ban on single-use plastics : promote reuse and waste source reduction. Pilot for a ban on single-use polythene bags in Islamabad (2019-ongoing): engaging and encouraging residents to use reusable bags, managing to reduce the source and minimise the waste of plastic bags in the city by imposing a ban on single-use polythene bags”.	Identifies plastics only as a type of waste/pollutant.
23	Papua New Guinea	“Adaptation actions - Priority area - Other - Waste: promoting solid and chemical waste management at national level; municipal waste management planning; special waste management planning (plastics , electronic waste, bulky waste, mining, etc.); raising awareness of household waste; community awareness and education.”	Identifies plastics only as a type of waste/pollutant.
24	Qatar	“Other projects include initiatives such as awareness campaigns advocating a ban on single-use plastics in society and annual collection campaigns.”	Identifies plastics only as a type of waste/pollutant.
25	South Korea	“The Republic of Korea's waste management policy centres on reducing waste production while increasing recycling. Existing petroleum-based plastics will be replaced by bioplastics and methane gases emitted from landfills will be recovered for use as an energy source.”	Although it recognises that the raw material for most plastics is oil (directly associated with GHG emissions), it only lists plastics as a type of waste/pollutant.
26	Rwanda	“Waste recycling progress (e.g. policies and practices; recycling rates for plastics , metals and paper)”.	Identifies plastics only as a type of waste/pollutant.
27	São Tomé and Príncipe	“Strengthen the national legislative framework on waste management by establishing a national, sustainable, integrated and coherent structure, as well as promoting initiatives to reduce or eliminate single-use plastics .”	Identifies plastics only as a type of waste/pollutant.
28	Seychelles	“By 2030, all tourist accommodation and catering businesses should have phased out the use of non-recyclable plastic bottles and replaced them with recyclable containers”.	Identifies plastics only as a type of waste/pollutant.
29	South Sudan	“South Sudan shall also promote the prevention, minimisation, recycling and reuse of waste in different sectors, such as agriculture, hotels and restaurants, construction and industry (e.g. (...);	Identifies plastics only as a type of waste/pollutant.

		plastic waste can generate waste-derived fuels, which can be used in industry; (...) Informal waste pickers collect recyclable materials from dumpsites , such as plastics , scrap metal and tyres, which they sell to private companies. Informal waste pickers collect recyclable materials from dumps, such as plastics , scrap metal and tyres, which they sell to private companies. (...) South Sudan should promote the use of secondary sources in the construction of new <i>stocks</i> , such as recycling plastics into tiles .”	
30	Sri Lanka	“Sri Lanka is highly vulnerable to the adverse impacts of climate change (...) having already launched important initiatives such as (...) the ban on single-use plastics .”	Identifies plastics only as a type of waste/pollutant.
31	Tajikistan	“According to the State Target Programme for the Development of the Transport Complex of the Republic of Tajikistan until 2025, the life cycle of the transport infrastructure will be increased, which will make it more resilient to climate change. (...) Specific activities include improving the pavement, increasing traffic capacity, building secondary roads in settlements, applying paints, plastics and metal protection against corrosion, and creating protective belts on the roads.”	In this case, plastics are not even identified as a type of waste, but as a mere material to be used in a transport development programme.
32	Tonga	“A specific measure to be implemented (in the waste sector) concerns the phasing out of single-use plastics .”	Identifies plastics only as a type of waste/pollutant.
33	Turkey	“Green growth technology roadmap for the plastics sector (development of waste management and innovative recycling processes in the plastics industry). (...) The green growth technology roadmap focuses on achieving a green transition in the iron-steel, aluminium, cement, chemicals, plastics , and fertiliser sectors.”	Identifies plastics only as a type of waste/pollutant.
34	Uganda	“The contribution of biodegradable organic waste has decreased, while plastic and paper waste has increased . Municipal solid waste is mainly organic (green and food waste) and accounts for 72 per cent, while plastic and paper waste accounted for 12.4 per cent and 10.2 per cent respectively. Plastic content in waste increased from 1.6 per cent to 12.4 per cent in the period”.	Identifies plastics only as a type of waste/pollutant.

35	United Arab Emirates	“The ban on single-use plastics reduces GHG emissions from the production of plastics that use petrochemical derivatives as raw materials. It also reduces GHG emissions from the disposal of plastic waste.” (...) In line with the UAE's circular economy goals, Abu Dhabi banned single-use plastic bags in 2020 and will ban Styrofoam containers in 2024, and Dubai introduced a nominal charge of 25 fils per plastic bag. The UAE plans to impose a nationwide ban on single-use plastic bags from January 2024, which account for approximately 40 per cent of all plastic nationwide. (...) To further reduce waste, the UAE has joined the <i>Coalition Circle</i> in a public-private partnership. Established in 2019, the aim of the partnership is to tackle plastic waste and packaging pollution by trialling a pilot recycling model for plastic bottles, beverage cartons and other packaging in Abu Dhabi.”	It relates plastics to GHG emissions by considering more stages in the life cycle of these materials (not just disposal), and recognising that petrochemical derivatives are used in their production.
36	Vanuatu	“Mitigation Priority Area - Municipal Solid Waste: by 2030, develop and implement a National Strategy for Plastics”.	Identifies plastics only as a type of waste/pollutant.
37	Vietnam	“Development of RDF (fuel produced from plastic and paper waste) and application of solid waste recycling technologies; production of compost and waste-derived fuel (from plastic and paper waste) (...). In the waste sector, the measures for reducing emissions that co-benefit socio-economic development at a high level are the reduction of solid waste and the production of RDF (from waste plastic and paper).”	Identifies plastics only as a type of waste/pollutant.
38	Zimbabwe	“In terms of challenges, Zimbabwe’s urban local authorities are facing major challenges in solid waste management due to population growth, urbanisation, industrialisation and the increased use of non-biodegradable plastics and bottles.”	Identifies plastics only as a type of waste/pollutant.