



Advancing Ocean Justice

in the Global Plastics Treaty



Earth Law Center

Earth Law Center (ELC) is a 501(c)(3) non-profit organization working to advance ecocentric laws, policies, and governance for the well-being of the Earth Community. ELC aims to mitigate the effects of climate change, biodiversity loss, and degradation of ecosystems and to restore a flourishing Earth Community on behalf of present and future generations of all species. ELC is a member of the United Nations Economic and Social Council (ECOSOC), the Plastic Pollution Coalition, the International Union for the Conservation of Nature, and the High Seas Alliance.

Acknowledgments

This Report was youth-led, prepared by Gen-Z and Millennial ocean policy professionals. Earth Law Center would like to thank the following authors and reviewers: Rachel Bustamante, Audrey Danthinne, Collin Oliver, Ciara Shea, Linnéa Hansen, Josh Novak, Karen Maessen, and Matt Zepelin.

Layout and graphic design: Rachel Bustamante, Earth Law Center

To quote this Report, please use the following reference:

Earth Law Center (2024), Advancing Ocean Justice in the Global Plastics Treaty.

Published in February 2024 by ELC.

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An aerial photograph of a dense forest. A single, large, vibrant green tree is circled in a semi-transparent green circle, standing out from the surrounding darker green canopy. The background is a deep blue, suggesting a sky or water surface.

“We need a strong, ambitious, and just plastic treaty, but that is only the first step.”

- Jyoti Mathur-Filipp, Executive Secretary of the INC [1].

INC-4 CALL TO ACTION

The full lifecycle of plastics is inherently an issue of justice: disproportionately harming both the ocean and marginalized communities.

The Revised Zero Draft (ZD), prepared by the Secretariat of the International Negotiating Committee (INC), signifies the next step towards reaching an international legally binding instrument on plastic pollution. To address the far-reaching environmental and socio-economic impacts of plastics, we urgently call upon Member States, at the upcoming fourth session (INC-4) in April 2024 in Ottawa, Canada, to elevate their ambition and champion justice within the global plastics treaty (GPT). This imperative will help safeguard the well-being of both human communities and the ocean and ensure the inclusion and representation of those most impacted. Consequently, a justice-centered approach also enhances the prospect of comprehensively mitigating the interconnected and transboundary challenges inherent to the scope and objectives of the treaty.

To realize a GPT that is both equitable and just in its formation and implementation, justice must be embedded throughout the framework. This Report offers a strategic guide to advancing ocean justice within the GPT and outlines Earth Law Center's (ELC) top-line recommendations.

Ocean justice represents the intersection of the protection of the ocean, the fulfillment of human rights, and the progression of social equity [2,3]. It is a critical aspect for analysis within the treaty framework, serving as an illuminative approach to ensure that the highest

protective measures are adopted for the ocean and human communities.

The Report begins by **Conceptualizing Ocean Justice** in the context of plastics, followed by the **GPT Priorities Roadmap**. Drawing from relevant literature and expert insights, this roadmap provides an **INC-4 Recommendations Summary** and culminates in a comprehensive analysis of recommendations across critical articles like **principles, emissions and releases of plastics, microplastics, and a just transition**.

It is imperative that the GPT embed a justice-centered approach to safeguard human rights throughout the plastic lifecycle, advancing ocean protection and social equity. With this objective in mind, the Report is poised to serve as a powerful advocacy tool ahead of INC-4 and a valuable asset to bridge existing gaps in understanding injustice in the plastics context—shedding light on the path toward advancing an equitable global plastics treaty.

As it stands, the Revised Zero Draft: 1. Does not include a binding obligation to protect human rights throughout the lifecycle of plastics and 2. Does not contain a single instance of the words "justice" or "inequity."



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Abbreviations

ALDFG - Abandoned, Lost, or otherwise Discarded Fishing Gear
BBNJ - Biodiversity Beyond National Jurisdiction
BIPOC - Black, Indigenous, and People of Color
BPA - Bisphenol A: A chemical additive to increase plastic rigidity; known endocrine disruptor
BPS - Bisphenol S: A chemical additive in hard plastic and synthetic fiber; known carcinogen
CBD GBF - Convention on Biological Diversity, Kunming-Montreal Global Biodiversity Framework
CBDRRRC - Common But Differentiated Responsibilities and Respective Capabilities
EDC - Endocrine Disrupting Chemicals
FPIC - Free, Prior and Informed Consent
GPT - Global Plastics Treaty (standing for the international legally binding instrument on plastic pollution, including in the marine environment)
GHG - Greenhouse Gas
GRULAC - Group of Latin American and Caribbean Countries
INC - Intergovernmental Negotiating Committee on Plastic Pollution
IPLC - Indigenous Peoples and Local Communities
IPMG - Indigenous Peoples Major Group
LDCs - Least Developing Countries
MEA - Multilateral Environmental Agreement
MPs - Microplastics
NPs - Nanoplastics
POC - People of Color
POPs - Persistent Organic Pollutants
PSIDS - Pacific Small Island Developing States
Revised ZD - Revised Zero Draft Text (UNEP/PP/INC.4/3)
SDGs - Sustainable Development Goals
SIDS - Small Island Developing States
UNDP - United Nations Development Programme
UNEP - United Nations Environment Programme
UNGA - United Nations General Assembly

A wooden boat is shown from a high angle, sailing on a dark blue sea that is completely covered with a dense layer of multi-colored plastic trash. The boat's wooden hull and rigging are visible, and the scene is set against a clear blue sky.

**“Ocean justice is where
ocean conservation and
social justice intersect.”**

- Ayana Elizabeth Johnson, Ph.D.
Co-founder, Urban Ocean Lab [2].

An aerial photograph of a tropical coastline. On the left, a sandy beach is bordered by lush green vegetation, including palm trees and dense shrubs. The water transitions from a shallow, light blue near the shore to a deep, dark blue further out, where a coral reef is visible. The overall scene is bright and clear, suggesting a healthy marine environment.

Conceptualizing Ocean Justice

The upcoming section introduces ocean justice within the realm of plastics, exploring the interplay between ocean preservation, human rights, and social equity. It identifies key justice elements for the GPT, maps the impacts of the plastic lifecycle on the ocean, assesses Member States' support for human rights inclusion, and pinpoints stakeholders most affected by the plastic lifecycle. This analysis lays the groundwork for the subsequent half of this Report, which presents a GPT Priorities Roadmap.

Overall, plastic governance requires an integrative and justice-centered approach to ensure fair outcomes for the ocean and affected communities, aligning with global goals of maintaining planetary boundaries, advancing the SDGs, and staying below the 1.5°C warming threshold.

Ocean Justice Overview

Plastics impact all ecosystems and people in various ways across their lifecycle, mainly through plastic pollution, with the long-term effects and toxicity of plastic-added chemicals and their interactions still not fully understood [4]. Yet these outcomes are not equally distributed. To address the injustices of plastic harm to the ocean and human communities, it is essential to analyze how these disproportionate outcomes are interconnected.

This analysis is crucial for effectively identifying policy solutions within the GPT to advance **ocean justice, encompassing protection for the ocean, fulfillment of human rights, and progression of social equity** [2,3,5-7].

Intersectional theory, in its application to environmental issues, is a uniquely illuminating framework for understanding the complexities of the plastic crisis, as the interconnected nature of injustices towards the environment and people are brought to light [6,8-10].

This Report utilizes this intersectional lens to analyze how the ocean and marginalized communities are disproportionately impacted and how embedding human rights and concepts of justice within the GPT will strengthen environmental and social outcomes. **The GPT must apply justice throughout, or otherwise risk exacerbating social regression and inequity in the full lifecycle of plastics** [5,11].



As outlined in Table A, five primary forms or concepts of justice are particularly relevant in the plastics sphere and can serve as informative guidelines for integrating justice in the GPT [12].

Table A. Concepts of Justice in the Context of Plastics

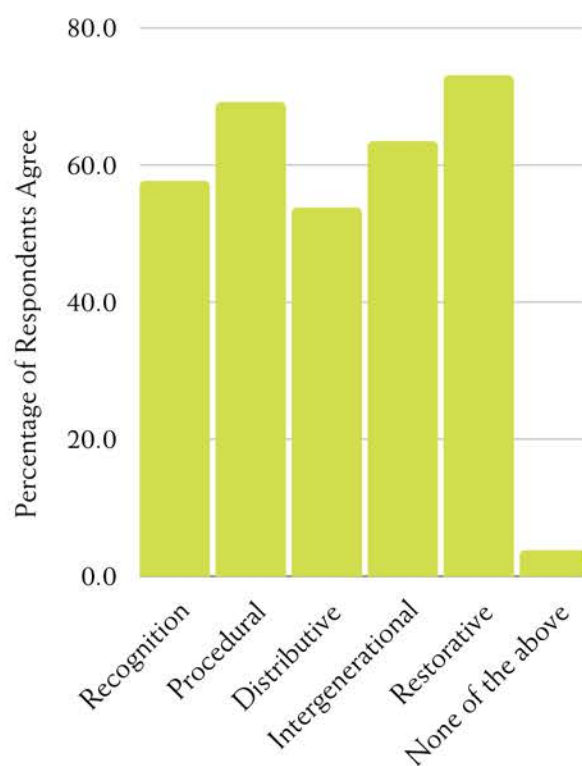
Recognition justice	Accounting for or explicitly acknowledging the injustices plastics cause within marginalized communities and ecosystems, and accounting for or explicitly recognizing those collective identities and their interests, values, or needs in the GPT [11,13-17]
Procedural justice	Ensuring meaningful participation, fairness, and equity for affected communities as stakeholders in consultation and transparent decision-making, thereby relevant to the GPT negotiation process, obligations agreed upon, and implementation [11,16-18].
Distributive justice	Considering the fair distribution of environmental burdens and benefits across the entire plastic lifecycle, accounting for historical, cultural, social, and economic contexts in determining who bears the burden of responsibility, and providing financial, technical, and capacity-building support to implement obligations [19,20].
Intergenerational justice	Considering the needs and interests of future generations in current decision-making regarding the entire plastic lifecycle [20,21].
Restorative justice	Addressing harms or risks of the full plastic lifecycle to both human communities and ecosystems, engaging to reach a collective understanding of how to repair harms and realize justice and accountability [22-24].

Earth Law Center conducted an online survey to understand diverse perspectives on advancing ocean justice within the GPT and exploring potential strategies, reaching out to 1370 individuals for participation. Ultimately, 52 respondents contributed. Stakeholder identification among participants included 57.7% nonprofit, 17.3% government, 15.4% academic, and 9.6% business.

Throughout this Report, survey findings will be analyzed and cited accordingly. Please refer to the Appendices for a comprehensive overview of the methodology employed.

Figure B illustrates responses to the query regarding which justice concepts should be integrated into the treaty, including the option to select “none of the above.”

Figure B. Response: Concepts of Justice



Ocean Protection

Table C vividly portrays the ocean's vulnerability to the plastic lifecycle, a reality extensively documented. The current linear 'take and waste' model of the plastic industry exceeds ecological and planetary boundaries [25]. Shifting to a circular economy requires a restorative, regenerative, and systemic approach to circulate all plastic value within the economy, preventing leakage into the environment.



Extending the concepts of justice to the ocean is crucial for adopting robust protective measures in the GPT. This perspective prompts us to assess what the ocean needs to be healthy and how plastics impact not only human uses of the ocean but also integral ecological processes [26-29].

Given the ecological needs of marine biodiversity and oceanic well-being within the

context of the plastic lifecycle, Member States should inquire:

1. **Recognition justice:** Is the ocean genuinely represented within the GPT?
2. **Procedural justice:** Can communities with integral oceanic relationships authentically participate in the GPT process and implementation? E.g. Indigenous Peoples and Local Communities (IPLC) or Small Island Developing States (SIDS).
3. **Distributive justice:** How can the most burdensome and distributive harms to the ocean be addressed?
4. **Intergenerational justice:** Does the GPT recognize the full legacy of oceanic plastic pollution and its connection to climate change for the sake of future generations inheriting a healthy ocean?
5. **Restorative justice:** How are impacts mitigated and ocean health restored?

Table C. Impacts of Plastic Lifecycle to the Ocean

<p>Extraction</p> 	<p>Nearly all plastics are sourced from fossil fuels [30]. The extraction and transportation of crude oil and natural gas raise emissions and contribute to accelerating climate change, with consequential impacts to the ocean—both immediate and anticipated, especially if the 1.5°C warming limit is surpassed [5,31]. Activities such as offshore oil prospecting and fracking, among other detrimental practices, contribute to noise pollution, release toxic chemicals into the water column, and, in severe cases, can lead to devastating oil spills [32,33].</p>
<p>Production</p> 	<p>Plastic production and refining constitute an exceptionally energy-intensive manufacturing sector, concurrently releasing substantial atmospheric emissions [30]. To illustrate, "6% of global coal electricity is used for plastic production" [34]. The production and transportation of nurdles, small and lightweight plastic pellets, inadvertently spill into the environment, rivers, waterways, and the ocean during between plastic facilities, such as via cargo ships [35,36]. Notably, evidence suggests a staggering 22,887.5% increase in plastic production from 1950 to 2019, surging from 2 million to 459.75 million metric tons [37].</p>

Consumption



The consumption of plastic at sea, driven by activities such as fishing and shipping, contributes substantially to pollution. Historically underestimated, plastic emissions at sea are projected to currently range from “0.2 to 0.6 million metric tons per year” [38]. Approximately 10% of ocean plastics are from abandoned, lost, or discarded fishing gear (ALDFG), which is likely underestimated, and is the deadliest form of plastic pollution for wildlife [39-42]. This phenomenon leads to ‘ghost-fishing,’ resulting in the entanglement or death of numerous documented marine species. Ultimately, the widespread and escalating use of plastic naturally culminates in the final stage of its lifecycle: waste, causing significant harm to the ocean when polluted [43].

Waste



The ubiquitous presence of plastic pollution in the ocean is extensively documented. Plastic pollution represents a significant share of global waste and transcends borders, extending to the deep ocean, arctic, surface waters, and breeding habitats like estuaries, spanning “every ocean basin on the planet” [44,45]. Annually, 8-10 million metric tons of plastic enter the ocean, forming vast garbage gyres as well as breaking down into persistent microplastics (MPs) that may endure indefinitely [41,46]. This issue is compounded by a significant share of plastic waste being invisible to the naked eye or located on the seafloor (approximately two-thirds of all ocean plastics are estimated to be in areas too difficult to track) [47,48]. When factoring in plastic that does not end up as pollution, the incineration process, which accounts for roughly 19% of global plastic waste, releases CO₂ and methane emissions, worsening the climate crisis [49].

Oceanic legacy plastic pollution profoundly affects marine wildlife, influencing reproductive or immune functions and inducing changes in population size, distribution, fitness, genetic diversity, and ecosystem adaptation [44]. Disturbingly, scientists estimate that by 2050 ocean plastic could outweigh all fish in the ocean [11]. Research indicates over 700 species are affected by entanglement or ingestion of plastics, leading to severe consequences including starvation, suffocation, and drowning [44,50,51]. The consumption of plastics can cause obstructions to the digestive tract of wildlife, potentially leading to perforated organs. Approximately half of the global sea turtle population is estimated to have consumed plastic. In areas where plastic waste is prevalent on beaches, it can alter the sand temperature, affecting the incubation process and reproduction rates of sea turtles [52].

Finally, the impact of additive chemicals on plastics and their interactions with other contaminants at varying concentrations, distributions, and ecosystem conditions requires further research [50]. For example, coral reefs that come into contact with plastic have an 89% probability of contracting a disease [52]. Further, EDC exposures are found to be a significant risk to biodiversity, including harming reproductive, metabolic, and developmental functions. Consequently, this results in a loss of fitness for wildlife, which can increase susceptibility to “infectious diseases, notably in marine mammals, or the development of hormone-sensitive cancers” [44]. Chemical additives like BPA have been found to affect these functions in crustaceans and molluscs, even at low concentrations [45].

Human Rights

Protecting the environment is intricately tied to the enjoyment of the fundamental rights and freedoms of every human, including the “rights to life, health, and adequate standard of living, access to adequate food, and safe drinking water” [53].

As the full lifecycle of plastics harms human rights, the GPT must acknowledge these impacts and must incorporate language and legally binding obligations of those rights, including protecting the human right to a clean, healthy, and sustainable environment. Then, Member States must implement the agreement with a rights-based approach at all levels of governance [11].



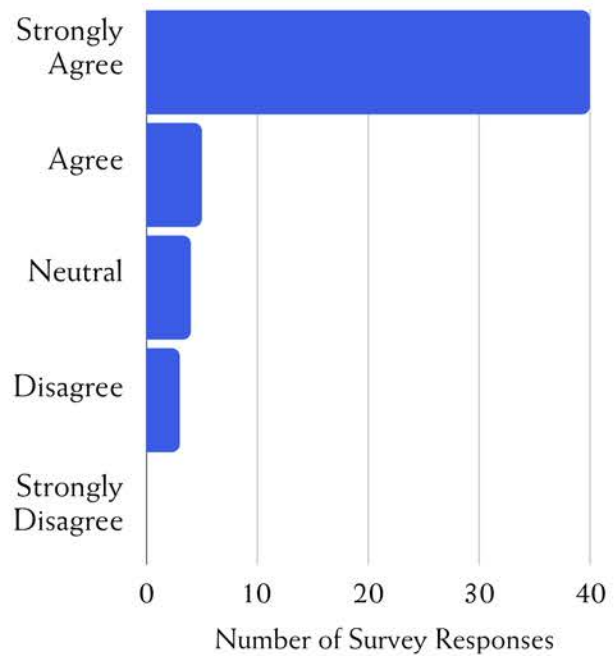
Human Right to a Clean, Healthy, and Sustainable Environment

The Human Rights Council in 2021 (A/HRC/RES/48/13) and UNGA in 2022 (A/RES/76/300) recognized the right to a clean, healthy, and sustainable environment for all. The GPT is a prime opportunity to realize this right within a Multilateral Environmental Agreement (MEA) [54,55].

In the context of plastics, the human right to a *clean* environment is infringed upon by the mass amounts of plastics polluting the oceans, shores, and communities. Currently, exposure to microplastics (MPs) and nanoplastics (NPs) violates the human right to a *healthy* environment—as they are present in our air, water, soil, and food—in addition to the chemical additives that are known to be hazardous to humans if consumed [56]. Lastly, the human right to a *sustainable* environment is at risk because of the increasing demand and production of plastic, which threatens the global climate system and human health in direct and less observable pathways. For example, according to UNEP, “around the world, **one million plastic bottles** are purchased **every minute**, while up to **five trillion plastic bags** are used worldwide every year, with half of all plastic produced for single-

use purposes—used just once and then thrown away” [57]. These activities are certainly not supportive of a sustainable environment. Figure D depicts strong survey responses in support of protecting these fundamental human rights.

Figure D. Response: Inclusion of an obligation to protect the human right to a clean, healthy, and sustainable environment



Operationalizing Human Rights in the GPT

In addition to explicitly acknowledging or obligating the protection of the human right to a clean, healthy, and sustainable environment, it is imperative that human rights be operationalized across the entire lifecycle of plastics, ensuring alignment with human rights in all provisions throughout the text. For example, during the 52nd Regular Session of the Human Rights Council, the Permanent Representative of Peru, representing Peru and 32 other countries, stated that “the impact of plastic pollution on a broad range of human rights is undeniable,” urging States to develop the GPT to be “firmly rooted in a rights-based approach” [58].

To date, there is evident support from Member States for including human rights. In pre-session statements at the last INC session in November 2023 in Nairobi, Kenya (INC-3):

- Guinea-Bissau affirmed the necessity for the treaty to explicitly embody the right to a clean, healthy, and sustainable environment “in its objectives and throughout the text” [59].
- Similarly, the Cook Islands emphasized the importance of adopting a precautionary human rights-based approach to protect the “rights of Pacific Islanders and Indigenous communities,” thereby safeguarding the ocean as well [60].
- Finally, in both INC-3 opening and closing statements, the Group of Latin America and the Caribbean Countries (GRULAC) stated firm support for human rights as a “cross-cutting guiding principle” regarding the instrument’s provisions and implementation [61,62].

A comprehensive review was conducted to assess further Member States’ support of human rights inclusion in the GPT, analyzing 376 documents across 175 countries. The full methodology is detailed in the Appendices. The results illustrated in Map E indicate a predominant endorsement of the inclusion of human rights, or comparable human rights terminology, such as the human right to a clean,

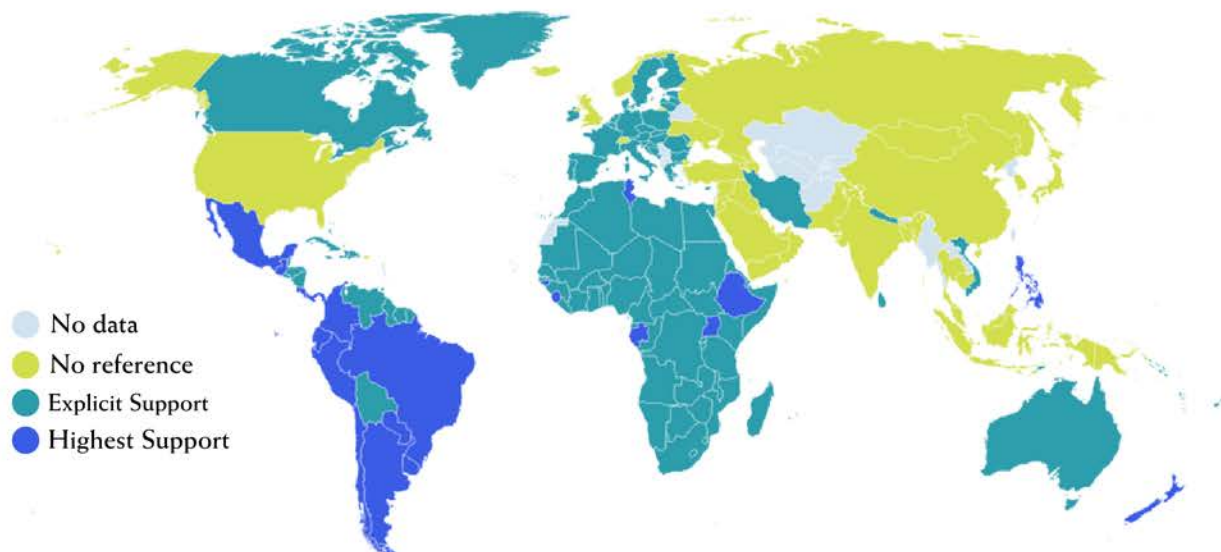
healthy, and sustainable environment, in the GPT. No countries explicitly opposed the incorporation of human rights.



Credit: Sophie Dingwall UN. In Images: Plastic is Forever

Notably, there is widespread support across the African and Latin American regions. It is crucial to highlight this correlation: the Global South, experiencing more significant impacts from plastics, exhibits the highest level of support for including human rights.

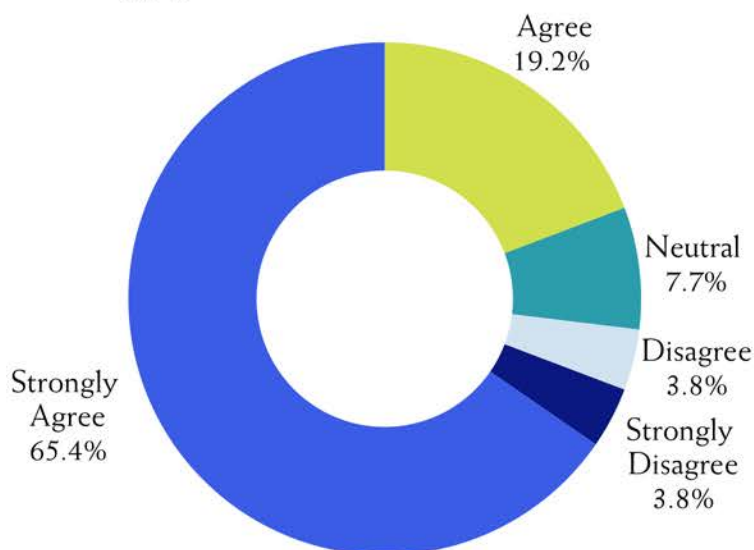
Map E: Support of Member States for Human Rights



Map: Earth Law Center * Source: INC pre-submissions and statements * Created with Datawrapper

Figure F illustrates the responses to the survey question concerning the inclusion of human rights within the GPT, with 84.6% in agreement.

Figure F. Response: Human Rights in the GPT



➔ Increasing Plastic Literacy

Despite widespread evidence that interplays occur between plastic additives, toxins, and ecological dynamics, our understanding of these chemical interactions remains limited, leaving potential risks and hazards largely unexplored by the scientific community [44]. These knowledge gaps, coupled with transparency issues surrounding plastic-related chemicals, “typically held back as confidential business information” from industrial producers, present significant obstacles to public awareness [63]. Increasing **transparency** and **plastic literacy** is critical to ensuring that individuals, communities, and regulators can make informed decisions to reduce exposure to the risks of plastics [64-66].

Plastics often contain carcinogens and other pollutants, comprising “hundreds of hazardous chemicals, including endocrine-disrupting chemicals (EDCs) that can mimic human hormones and impair the endocrine system” [67,68]. Evidence shows correlations with onsets of diabetes and various cancers following EDC exposures [44].

An estimated 13,000 different chemicals are associated with plastics, of which over 25% are known to be hazardous to human health. In fact, only half of these chemicals “have been screened for their hazardous properties” [63].

Additionally, plastics are a vector for toxins, meaning they can transport invasive species across ecosystems or traverse pollutants through freshwater and marine waters, threatening biodiversity and human health. As further explored in the Microplastics section, the short- and long-term implications of MPs and NPs for human health additionally require extensive research.

Nonetheless, compelling evidence suggests common chemicals found in plastics, such as methyl mercury, plasticizers, including phthalates, polychlorinated biphenyls, bisphenol A (BPA), and flame retardants, could leach into the human body and are linked to health concerns [69]. For example, these chemicals have been correlated to endocrine disruption, developmental disorders, reproductive abnormalities, and cancer.

A study on phthalates and their impacts on human health found that “compared to adults, children are significantly more vulnerable and sensitive in particular to phthalate exposure, especially during early growth” [70]. Currently, chemical additives in plastic act as a barrier to a safe plastic circular economy, which obligates that “all plastic packaging is free of hazardous chemicals, and the health, safety, and rights of all people involved are respected” [71,72].

Increasing plastic literacy through transparency, education, and meaningful participation in decision-making is fundamental to upholding the human right to access information and health [73]. In fact, UNEP also refers to the “rights to information” as a guiding principle of environmental justice that must be included in equitable plastic governance. In the same report,

UNEP recommends that countries educate consumers on the full lifecycle of plastics and “how to reduce their own production and creation of waste” [45].

Limited public awareness of health risks associated with plastics is largely attributed to research gaps, particularly in areas such as microplastics, coupled with a predominant focus on environmental impacts in media and communications [74]. For example, one study found that the majority of surveyed adults in Varanasi City, India, were unaware of the hazards posed by plastics and were engaging in behaviors exposing themselves and their children to BPA and BPS [75]. In a large-scale study of Portuguese adults, nearly half had not heard of microplastics despite approximately 75% being concerned about the impacts of plastic pollution [76].

While Member States and industrial producers are responsible for implementing systemic changes to realize the “safe circularity of plastics,” fostering **plastic literacy** can catalyze transformative shifts in plastic reliance and consumer behavior [11]. Moreover, the significance of raising public awareness regarding plastics is increasingly recognized. For example, in a historic case in the U.S., New York’s Attorney General filed a lawsuit against PepsiCo Inc. for harming the public and the environment with its single-use plastic packaging, drawing upon the state-wide recently passed Green Amendment. In the complaint, Plaintiffs allege that “PepsiCo’s consumers and the public are not, and were not at all relevant times, aware of the nature or extent of the harms caused by PepsiCo’s single-use plastic packaging” [77].

To enhance plastic literacy under the GPT, under Part IV.7 on “Awareness-raising, education, and research,” Member States should consider including “developing communication materials regarding the health risks of plastic pollution,” **and of plastic use and the full lifecycle**, as plastic-associated threats to public health occur at every stage. Elevating awareness regarding alternatives to plastics, actions to avoid exposure, and proper disposal of plastics will also be critical elements to advancing plastic

literacy. Public education programs should comprehensively address all known pathways of toxic chemicals from plastics to the human body, encompassing risks from various sources, such as plastic food containers, menstrual products, toxins leaching into the soil from landfills, burning plastics as fire starters (a common practice in several Global South countries), as well as sources of MPs and NPs, such as single-use bottles and packaging, synthetic clothing, nail salons, and seafood [11,45,78,79].



Credit: Naja Bertolt Jensen, Unsplash.com

Social Equity

The third element for advancing ocean justice is the progression of social equity, meaning the “fair or just treatment among individuals or groups” [80]. In fact, there have been calls for justice-centered approaches to plastic pollution across diverse stakeholder groups, including science, business, government, and IPLC [80,81]. Recognizing how the plastic crisis is an interconnected issue of justice, equity, and health is imperative. Much like in the case of climate change, those who bear the brunt of the impacts throughout the plastic lifecycle are typically the least responsible, have the least capacity to evade the effects, and gain the fewest benefits from the production or consumption of plastics [82].

Further, such externalities are not regionally isolated; there is sufficient evidence of the global trend of plastic waste disproportionately ending up “in impoverished, marginalized, racialized, and Indigenous communities in both low- and high-income countries” [11]. To mitigate inequities across the plastic lifecycle, the GPT must “promote justice-oriented, rights-based rules at all levels and scales of governance, avoiding policies, market mechanisms, and incentives that deepen environmental injustice, racism, or human rights abuses” [11].

“Communities in developing countries are the least capable of managing the environmental, health, social, and cultural burden of plastic pollution due to a lack of government support or funds. That means women, children, waste workers, coastal communities, Indigenous Peoples, and people who depend on the ocean feel the impacts more intensely, particularly when moving or burning mismanaged waste. It also means these economies suffer as they are suffocated by plastics” [69].

As evidenced in Table G, the following stakeholder mapping offers a comprehensive, yet non-exhaustive, overview of the human communities that are most impacted by the lifecycle of plastics, recognizing that every group, in varying ways and contexts, has their human right to a clean and healthy environment infringed upon. Considering both the disproportionate impacts and burdens of plastics across race, occupation, ethnicity, class, gender, age, and other identity categories is a crucial lens for a GPT that effectively protects people and the planet. In particular, these stakeholders have vested interests in a GPT that promotes principles of justice to address these disproportionate impacts.

Ocean Justice “can also demand that we take positive steps to increase the participation of those who have been relatively marginalized and disempowered” [3]. Therefore, genuine participation and representation of these stakeholders in the GPT process and implementation is crucial. Explicitly recognizing these stakeholders is fundamental for **recognition justice**, an element enshrined in various multilateral environmental agreements (MEAs). For example, the Kunming-Montreal Global Biodiversity Framework, adopted at the 15th meeting of the Conference of the Parties to the UN Convention on Biological Diversity (CBD GBF), emphasizes the need to “ensure the full, equitable, inclusive, effective, and gender-responsive representation and participation in decision-making, and access to justice” for IPLC, “as well as by women, girls, children, youth, and persons with disabilities [83].”

Finally, these identity categories cannot solely be viewed in isolation but are inherently intersectional—an individual or community may indeed hold several of the listed identities in tandem. In truth, plastic impacts every human being. However, those with the ability to cope, avoid plastic use, or have access to justice for harm caused are grounded upon levels of privilege.

Table G. Stakeholder Mapping

<p>Indigenous Peoples</p>	<p>Historically, Indigenous Peoples have borne a significant impact during the early stages of plastic production, facing challenges such as deforestation and heightened exposure to pollution resulting from oil drilling activities, such as in the Amazon. Collectively, Indigenous Peoples are disproportionately exposed to plastic waste, particularly in coastal communities [45]. Further, as a consequence of oil exploitation and downstream pollution, the livelihoods of current and future generations are at risk. These impacts threaten their health while simultaneously endangering their natural resources and territories. For example, Indigenous coastal communities in Aotearoa and the Pacific consume up to four times more “kaimoana,” or seafood, “than the global average,” leading to increased exposure to microplastics present in the tissue of seafood [84,85].</p> <p>It is imperative for a GPT process and agreement to genuinely include and respect Indigenous Peoples in a manner that effectively and legally binds efforts to minimize exposures to plastics and harms from the full lifecycle. Recognized under the UN Declaration on the Rights of Indigenous Peoples, there is a clear obligation to include the perspectives and experiences of Indigenous Peoples in the process of establishing and administering justice and human rights in the GPT [86,87].</p> <p>However, as stated by the Indigenous Peoples Major Group (IPMG), thus far, they have experienced a lack of transparency within the INC process leading to impaired participation and their voices not being adequately recognized [88]. A just and equitable GPT necessitates a transparent and participatory process for all. As IPLC “have managed and protected their ocean for thousands of years,” they can contribute nature-based solutions and Traditional Knowledge with Free, Prior, and Informed Consent “for all sorts of pollutants and hazards” [87]. According to the Indigenous Peoples Representatives, IPLC should be guaranteed effective participation in the treaty negotiations and implementation.</p> <p>Additionally, a statement by the IPMG to INC-2 called on large plastic production companies to acknowledge their impact on Indigenous territories, urging reparations for the harm caused. The IPMG emphasizes that “local research should be promoted to provide real data on the depth of the impacts that plastic pollution has on the health of Indigenous Peoples and Mother Nature,” and that “Indigenous worldviews on intragenerational equity and equality challenge the dominant colonial and patriarchal culture and systems. A plastics treaty that is led by Indigenous Peoples and their worldviews is one that protects gender expression, women, children, and future generations” [89].</p>
<p>People of Color (POC)</p>	<p>Throughout the plastic lifecycle, People of Color (POC) encounter undue exposure and harm. For example, the placement of the incineration industry, often intentionally within low-income communities, exacerbates the disproportionate exposure of POC to fine plastic particles [90,91]. Further, according to the Sierra Club, “plastic products are used in Black, Indigenous, and People of Color (BIPOC) communities with a large frequency due to the taxpayer-subsidized low sales price that is offered as well as the convenience that comes with the use of plastic items” [92]. At the end of the plastic lifecycle, POC are often highly exposed through disposal, historically linked to the placement of landfills near BIPOC communities. According to a 2019 report from the <u>Global Alliance for Incinerator Alternatives (GAIA)</u> 79% of incinerators are located in BIPOC communities [91]. This exposure puts POC at a higher risk of severe damage to their neurological, immune, and reproductive systems, among other impacts [11,93]. According to research, the marginalization of POC becomes especially visible in health inequities, with POC in the U.S. facing disproportionate challenges related to limited accessibility, quality, and affordability of healthcare, for example [94].</p>

<p style="text-align: center;">Waste Pickers and Informal Workers</p>	<p>Waste pickers and informal workers “make a living collecting, sorting, recycling, and selling materials” [95]. They face several “occupational hazards” and significant health risks from their work [96]. Following the Agenda 2030 “Leaving No One Behind,” informal waste pickers play an essential role in transitioning the world’s current waste management into a sustainable and environmentally friendly system. This transition must be just, recognizing that individuals working in the waste sector are often marginalized and at risk of poverty [97]. The International Alliance of Waste Pickers emphasizes that to achieve a just transition, the GPT must implement an Extended Producer Responsibility (EPR), holding those who produce plastic accountable for recycling their products, and include guidelines for sustainable waste management to protect the workers involved [98]. According to UNDP, “the world must recognize informal waste pickers’ services to reduce pollution and protect our environment, ensure healthy working conditions, and compensate their work fairly” [97].</p>
<p style="text-align: center;">Small Island Developing States (SIDS)</p>	<p>Plastic pollution is especially detrimental for Small Island Developing States (SIDS), given their existing vulnerabilities in social, economic, and ecological dimensions [99,100]. Research indicates that due to sea currents, plastics often wash up on local beaches of SIDS. Consequently, hundreds of millions USD are lost each year from decreases in tourism and fishing revenue attributed to marine plastic pollution [96]. This loss can significantly affect SIDS, which may have fewer forms of revenue and economic resilience than larger coastal nations. As an example, the Bahamas, heavily dependent on local tourism, face the repercussions of increasing beach pollution, endangering its tourism-dependent economy [11,101].</p> <p>SIDS face additional risks from plastic production via fossil fuels, exacerbating threats from climate change-related sea level rise. To safeguard SIDS, it is crucial to reduce plastic production, which contributes to high CO2 emissions, ensuring efforts to stay below a 1.5°C global temperature increase [102,103]. In developing the financial mechanism under the GPT, SIDS must be prioritized and represented, given their particular vulnerability. Samoa, on behalf of the Alliance of Small Island States (AOSIS), additionally advocates for a remediation fund for legacy plastics in the ocean. To achieve this, AOSIS proposed their support of a binding action in national plans, seeking “commitments from developed countries in relation to financial support, capacity building and technology transfer for developing countries, especially SIDS” [104].</p>
<p style="text-align: center;">Least Developed Countries (LDCs) / Global South</p>	<p>According to the UN Office for Disaster Risk Reduction (UNDRR), worldwide plastic pollution can be “considered a slow-onset disaster” due to the failing management of waste [105]. Currently, the Global North exports significant amounts of waste to the Global South, an approach that is neither sustainable, just, nor effective [106]. Western countries often place “blame on <i>mismanaged waste</i>” on countries of the Global South rather than recognizing “the way issues of privilege and justice influence the distribution of debris around the world” [20]. This perspective ignores the current global approach to waste management, lacks EPR, and fails to hold plastic producers accountable. Least Developed Countries (LDCs) are confronted with the inequality of bearing the burden of plastic pollution when they are not the main producers of plastic in comparison to countries from the Global North [107].</p> <p>This trend is also described as ‘waste colonialism,’ where high GDP Nations dump their waste in low GDP countries, reflecting an overall capitalistic consuming approach [108,109]. For example, in 2022, Germany exported 800,000 tons of plastics, with a large share exported outside the EU, to Turkey, Indonesia, India, Vietnam, and Malaysia [110-112]. Some countries of the Global South rely on plastic production for economic stability, representing a significant source of income. For example, Vietnam generated USD 17.5 billion in 2018 from the plastic industry and Thailand acquired 36.9 billion in 2019. In both cases, the intake represented 6.7% of the country’s national GDP [113]. Consequently,</p>

<p>LDCs Continued</p>	<p>some countries of the Global South have raised concerns about the potential adverse effects of the GPT on developing and vulnerable economies. The government of Malaysia, for instance, expressed apprehension, stating: “We foresee a future where compliance with the treaty’s noble goals becomes an impossible challenge, risking our economies and well-being” [113]. An equitable financial mechanism and capacity-building support from developed countries to LDCs and the Global South will be essential.</p>
<p>Youth, Children, and Future Generations</p>	<p>Children and youth are especially at risk of hazardous contaminants in plastic. Bisphenol A (BPA), an additive that increases the rigidity of plastic, can be consumed through food and beverage containers, including baby bottles, sippy cups, cans of infant baby formula, pacifiers, and teething rings [114, 115]. BPA is a toxin that can enter human blood and tissue, disrupt the endocrine, reproductive, and renal body systems, and is a known carcinogen. Notably, BPA-free labeled products may still contain BPA [96]. Further, unborn babies are particularly affected as they are defenselessly exposed to toxins in their mothers’ wombs, as toxic chemicals and plastic contaminants are non-filterable for the placenta. These early-year exposures lead to heightened risks of severe diseases such as cancer, asthma, and types of diabetes previously only diagnosed in adults [116]. Additionally, experts see a link between early exposure to toxins and “developmental disorders, learning disabilities, and respiratory disease” [117].</p> <p>The consequences of the plastic lifecycle are severe, as the burning of fossil fuels, a primary source of airborne particulate matter, significantly contributes to air pollution and climate change, resulting in adverse birth outcomes and respiratory, neurodevelopmental, and mental health effects [118, 119]. Moreover, the World Health Organization indicates that “climate change increases diseases, including malnutrition, diarrhea, and malaria, mainly in poor children under ten” [119,120]. Environmental degradation, coupled with plastic acting as a multiplier for the recurrence and increase of diseases, poses a significant health risk to future generations. The escalating number of diseases, worsened by environmental damage and the influence of plastic, is especially alarming, indicating a rising global health threat, particularly in the context of potential future pandemics [116].</p> <p>Another threat for future generations is the degree of plastic pollution, which has environmental and planetary consequences. Fossil-fuel emissions and plastic toxins have already entered the hydrological cycle and are predicted to increase within the following decades [121]. Collectively, future generations will be impacted by decisions today, and continuing “business as usual” “would lead to another predictable environmental crisis for future generations to cope with” [122,123]. Given that children and future generations cannot yet voice their interests, it is imperative that the GPT considers the challenges they already face, which are poised to intensify. Children, youth, and future generations are among the most vulnerable stakeholders, whose futures and health depend on a just and equitable new treaty.</p>
<p>Women and people who menstruate</p>	<p>Women and people who menstruate are especially at risk due to exposure to hazardous plastic in menstrual health products since both the packaging as well as the products contain MPs [96]. Sanitary products like tampons and pads consist of up to 90% of fossil-fuel based plastic as well as BPA and bisphenol S (BPS) which impacts hormonal health. Additionally, female bodies are more at risk as they have a higher fat percentage, which leads to higher exposure to and absorption of, liposoluble toxins such as phthalate plasticizers [124]. According to scientific research, phthalate plasticizers negatively affect the entire endocrine system, including the overall health and balance of hormones, thyroid, and pituitary gland [125]. For example, plastic contamination and exposure consequences were observed in women residing near petrochemical refineries in Taiwan, South Africa, Argentina, Brazil, Canada, Thailand, China, Israel, Italy, and Spain. This study indicated women faced a higher probability of experiencing severe health risks such as “asthma, negative pregnancy and birth outcomes, and higher rates of attention deficit hyperactivity disorder” [81, 126,127].</p>

Frontline Communities

Frontline communities, referring to those facing the most immediate and severe impacts of the plastics crisis (“first and worst”), often including vulnerable groups such as impoverished individuals, the LGBTQI+ community, and people with disabilities, bear a disproportionate burden of both upstream and downstream plastic impacts [93]. For instance, individuals residing near petrochemical plants, such as those in ‘Cancer Alley’ in the U.S., are confronted with a heightened risk of being diagnosed with lung cancer compared to the national average [81,128]. In Taiwan, Europe, and Nigeria, populations living near petrochemical plants have been found to have increased rates of leukemia, brain cancer, bladder cancer, non-Hodgkin’s Lymphoma, and multiple myeloma [129]. Collaboration with disabled individuals is imperative for crafting equitable plastic policies across all levels, given that a considerable portion of medical equipment comprises plastic or is single-use, often crucial for maintaining sterility or essential for activities such as eating and medication intake. Moreover, individuals with disabilities are more likely to face disproportionate poverty, further exposing them to the adverse impacts of plastic pollution [130].

Finally, low-income populations are burdened by the proximity of landfills to their communities, exposing them to “microplastics, nanoplastics, and hazardous chemical toxins from macroplastic waste in landfills or disposal areas [that] escape into soil, groundwater, and air” [81,131]. Finally, the rising cost of recycling has unfairly impacted impoverished citizens in certain U.S. cities, who are now required to pay for recycling plastic amid increasing living expenses. This disparity underscores the disproportionate burden placed on low-income consumers rather than the producers of plastic [81].

Plastic Industry Workers

People employed in the plastic industry are dependent on plastics for income and subject to its high occupational health and safety risks. Along the entire lifecycle, workers are exposed to hazardous chemicals and working conditions:

1. Extraction: Workers at oil extraction sites and refineries are at high risk of developing terminal respiratory diseases (black lung, silicosis, chronic obstructive lung disease, mesothelioma, lung cancer), as well as vulnerable to fires or explosions in the workplace [132]. In fracking sites, workers can be exposed to neurological, reproductive, and developmental toxins, carcinogens, and chemicals that impact the skin, eyes, respiratory system, nervous system, gastrointestinal system, liver, and brain [133].
2. Production: Workers in plastic production facilities are exposed to high levels of styrene (a common ingredient in plastic), which leads to chronic bronchitis and other lung complications. They are also exposed to endocrine disruptors, mammary carcinogens, and toxins that harm the nervous and reproductive systems [133-135]. The transportation of fossil fuels poses additional risks from spills and explosions that include injury, death, or chronic health issues like cancer or psychological problems. Petroleum workers, in general, are at elevated risk of mesothelioma, multiple myeloma, skin melanoma, prostate cancer, urinary bladder cancer, lung cancer, and leukemia [136].
3. Waste: The plastic waste management industry exposes workers to a myriad of harmful substances, including heavy metals, lead, mercury, dioxins, furans, acid gases, hydrogen chlorine, cadmium, and fine particulate matter. Recycling facility workers, in particular, face exposure to toxins such as dioxins, volatile organic compounds, Dechlorane Plus, and the thousands of chemical additives present in plastics [133,137,138]. Additionally, certain toxins and carcinogens are generated during the recycling process itself, increasing the risk of cancer for these workers [66]. Moreover, the incineration of plastic waste releases ultra-fine particles, resulting in potential health effects that often go unnoticed, amounting to violations of human rights (e.g. Article 23, 25 UDHR) [96,116]. Undeniably, the level of exposure and health risks of the industry cause plastic workers to “have a body burden that far exceeds that found in the general public” [135].



“Every SDG is in jeopardy by plastics. INC-4 must advance justice for people and the ocean.”

- Rachel Bustamante, Ocean Program Director, Earth Law Center

GPT Priorities Roadmap

The previous section analyzed ocean justice as a framework to plastic governance, outlining concepts of justice and tangible applications to the GPT. This next section summarizes concrete recommendations to advance ocean justice within the treaty framework, including a concise overview to guide stakeholders at INC-4. Subsequently, the roadmap covers pivotal articles addressing Principles, Emissions and Releases of Plastics, Microplastics, and a Just Transition, offering insights, justice connections, textual recommendations, and case studies.

To achieve equitable and sustainable outcomes for the ocean and affected communities, the GPT must align with justice and human rights. Let us raise ambition and advocate for justice—people, the ocean, and the planet depend on it.

INC-4 Recommendations Summary



Operationalize the protection of human rights across the full lifecycle, ensuring all provisions align with human rights throughout the entire text.



Integrate a justice-centered approach to ensure the protection of the ocean, fulfillment of human rights, and progression of social equity.

Preamble Inclusion:

- *Noting with concern* the specific impact of plastic pollution on the marine environment and the impacts of the entire plastic lifecycle on vulnerable communities, including Indigenous Peoples, SIDS, LDCs, youth, and future generations.
- *Stressing* the importance of ensuring the protection of human rights, justice, and equity across all local, regional, and national actions.

STRENGTHEN BINDING OBLIGATIONS ACROSS ALL CONTROL MEASURES, INCLUDING TO:

- **Eliminate, reduce, and phase out** primary plastic polymers (II.1); chemicals and polymers of concern (II.2); and problematic and avoidable plastic products, including short-lived and single-use plastic products and intentionally added microplastics (II.3).
- Clarify that **exemptions are a justice tool** for LDCs and SIDS, guided by a stringent oversight procedure, decision-making authority, and time-bound implications with clear non-compliance measures, in which exemptions for microplastics are avoided (II.4).
- **Prevent** unintentional releases of microplastics into the environment (II.3; II.8); **prevent** abandoned, lost or discarded fishing gear (II.8; II.9); and **prevent and eliminate** the emissions associated with the full plastic lifecycle, and releases of plastic polymers, chemical pollutants, and plastics, including microplastics, across their lifecycles (II.8).
- Take actions to address **existing plastic pollution, including in the marine environment** (II.11).
- Ensure a **just and equitable transition for all**, paying particular attention to those marginalized and most affected by the transition, **with recognition and protection of labor and human rights** (II.12).
- Provide the **financial, technical, and capacity-building resources** to implement the instrument, aligned with the Polluter Pays Principle, particularly from developed countries to LDCs and SIDS (III.1; III.2).
- Develop and implement **national plans** with binding actions across all control measures and binding provisions to increase both transparency and accountability (IV.1).
- Promote awareness, education, and participation regarding plastic pollution, including Indigenous Knowledge with Free, Prior and Informed Consent (IV.7); strengthen **transparency** (II.13); and promote active and meaningful participation of IPLC, women, youth, the informal sector, and other vulnerable groups (IV.8).

Recommended Principles

According to UNEP/PP/INC.2/4 (or the “Options Paper”), “the guiding principles set out in multilateral environmental agreements assist in their implementation and interpretation. Such principles may relate to principles of international law, principles of interpretation, or other conceptual contexts relevant to the agreement’s subject matter” [139]. With this perspective, Table H delineates recommended

principles and provides rationales for their inclusion in the GPT. While this list is not exhaustive, the highlighted principles are crucial for advancing ocean justice. Additionally, supportive data from the aforementioned online survey is included in the table, indicating the percentage of respondents ($n = 52$) who agreed with including each principle in the GPT, with the option to select “none of the above.”

Table H: Recommended Principles for Inclusion in the GPT

Principle	Survey Data (n = 52)	Rationale
Environmental / Social Justice	86.5%	<p>Environmental justice and/or social justice is a fundamental principle to implementing the GPT. While the “Options Paper” initially included an “equity principle,” the Revised ZD does not encompass equity or justice as proposed principles. This umbrella term of environmental or social justice encapsulates all the diverse concepts of justice to protect human and natural communities.</p> <p>Justice should be central to the interpretation and implementation of every article, aiming to address historical exclusion or harm and promote equity, inclusion, representation, participation, and equitable distribution of benefits and responsibilities across genders, as well as for youth, Indigenous and marginalized communities, waste pickers, and other frontline populations [140]. Justice is included in other MEAs, like the Paris Agreement, which states “noting the importance for some of the concept of ‘climate justice,’ when taking action to address climate change” [141].</p>
Human Rights / Human Rights-Based Approach	67.3%	<p>In addition to operationalizing human rights throughout the treaty text, it is crucial to incorporate human rights or a human rights-based approach as a guiding principle of the GPT. This acknowledgment reflects Member States’ commitment to protecting human rights throughout the plastic lifecycle and should thus serve as a core principle of the treaty. Including a human rights principle aligns with the UNGA Resolution on the right to a clean, healthy, and sustainable environment and other human rights considerations integral within MEAs [55]. For example, the preamble of the Paris Agreement states Parties, that when taking actions to address climate change, should “respect, promote, and consider their respective obligations on human rights, the right to health, the rights of Indigenous Peoples, local communities, migrants, children, persons with disabilities and people in vulnerable situations and the right to development, as well as gender equality, empowerment of women, and intergenerational equity” [83,141].</p>

<p>Common but Differentiated Responsibilities and Respective Capabilities (CBDRRC)</p>	<p>57.7%</p>	<p>Incorporating the principle of common but differentiated responsibilities and respective capabilities (CBDRRC) into the GPT is vital for fostering broad cooperation among all Member States and ensuring effective environmental protection. CBDRRC, in this context, underscores two critical points: first, that global plastic pollution is a shared challenge requiring collective global action, emphasizing the responsibility of all Member States to address it. Second, it acknowledges the varying capacities of Member States, particularly as some are more vulnerable to plastic pollution than others and have fewer technical capacities to meet the provisions, thus promoting equity. This recognition aligns with the principles of the United Nations Framework Convention on Climate Change (UNFCCC), Principle 7 of the Rio Declaration on Environment and Development, and Article 10 of the Kyoto Protocol [142-144]. Moreover, it aligns with SDG 10 of the 2030 Agenda for Sustainable Development by reducing inequality among countries, SDG 12 through responsible consumption and production, and finally, SDG 17 by strengthening global partnerships [145].</p>
<p>Indigenous Knowledge</p>	<p>69.2%</p>	<p>Including Indigenous Knowledge as a fundamental principle within the GPT is imperative, extending beyond mere representation to ensure equitable involvement, consultation, and respect for Indigenous communities in decision-making processes. Acknowledging and respecting the rich Traditional Knowledge, rights, and participation of Indigenous communities is vital for rectifying historical injustices and addressing the role of the plastic lifecycle in perpetuating harm to their territories and natural relationships, including oceanic connections [28]. Many Indigenous cultures deeply understand the symbiotic connection between human beings and nature. To actively include Indigenous communities in decision-making processes, the GPT should emphasize the consideration of diverse knowledge systems, aligning with other multilateral agreements (e.g., CBD GBF, UNDRIP, Paris Agreement, and BBNJ Treaty) [83,86,141,146]. Efforts should be directed at amplifying the agency and Traditional Knowledge of Indigenous Peoples aiming to deconstruct colonial ideologies and address historical exclusion, dispossession, and disregard [27,28].</p>
<p>Free, Prior and Informed Consent</p>	<p>51.9%</p>	<p>The principle of Free, Prior, and Informed Consent (FPIC) is “a cornerstone of Indigenous Peoples’ rights,” crucial for procedural justice [147]. This principle ensures full and meaningful participation and safeguards Indigenous sovereignty and self-determination. In fact, the Inter-American Court of Human Rights emphasizes the obligations of Member States to conduct “special and differentiated consultation processes” when the interests of IPLC are at stake [148].</p> <p>The IPMG advocates for “Indigenous-led implementation” and research rather than external evaluation, emphasizing the need for Indigenous spaces to be protected from the impacts of plastic pollution [88]. They stress the importance of partnership with Indigenous Peoples, highlighting that their full FPIC is essential for enabling community-led solutions to plastic pollution. The inclusion of the FPIC principle is essential to incorporating Indigenous Traditional Knowledge into the GPT. It also aligns with other MEAs (i.e. BBNJ Treaty that recognizes that Traditional Knowledge “shall only be accessed with the free, prior, and informed consent or approval and involvement” of IPLC; and the CBD GBF that acknowledges Traditional Knowledge, “innovations, worldviews, values and practices” are “respected, and documented and preserved with their free, prior and informed consent” [83,146].</p>

<p>Just Transition</p>	<p>69.2%</p>	<p>Ensuring a just transition is essential to “leave no one behind,” in line with the 2030 Agenda for Sustainable Development. Therefore, just transition should be both a principle and a core obligation of the GPT. By incorporating it as a principle, Parties would be compelled to adopt a whole-of-society approach involving all stakeholders affected by GPT provisions, with particular attention to LDCs, SIDS, workers throughout the plastics value chain, and marginalized people and communities, so that no one is left behind.</p>
<p>Intergenerational Equity</p>	<p>61.5%</p>	<p>The implementation of the instrument should be guided by the principle of Intergenerational Equity, a widely recognized principle of international law, which aims to meet the needs of the present without compromising the ability of future generations to meet their own needs. The plastic crisis directly affects future generations, both of humans and nature, and their ability to meet their needs and thrive. This rising crisis of waste, coupled with the still unknown effects of toxic plastic buildup in human tissue and ecosystems, threatens the health and autonomy of future generations.</p>
<p>Intragenerational Equity</p>	<p>46.2%</p>	<p>Intragenerational equity is concerned with fairness and justice across people and communities within the present generation. The principle of Intragenerational Equity should be included in the GPT, as the plastic crisis disproportionately affects the most vulnerable populations. Implementing a just agreement requires addressing present inequities and ensuring an advancement, rather than a regression, in social, economic, and environmental contexts. Principle 6 of the Rio Declaration stipulates: “the special situation and needs of developing countries, particularly the least developed and those most environmentally vulnerable, shall be given special priority,” while Principle 3 accounts for ensuring the right to development “to equitably meet developmental and environmental needs” of both present and future generations [143].</p>
<p>Rights of Nature</p>	<p>71.2%</p>	<p>In addition to human rights, the GPT can protect nature’s right to a clean, healthy, and sustainable environment. In fact, Fiji supports this principle, stating: “The instrument should recognize and consider diverse value systems and concepts, including the rights of nature” [149]. Plastic pollution violates the “rights of nature: understood as innate legal rights to exist and thrive independent of humans” [11].</p> <p>The IPBES assessment on the valuation of nature has found that the causes of and solutions for our global environmental challenges are tightly linked to how we value our environments [150]. Their findings show that including a range of valuations of nature into policy, such as through the Rights of Nature, can advance justice and sustainability by addressing the diverse ways people relate to and value nature. Such recognition of different value systems has additionally been included within the CBD GBF, recognizing “rights of nature and rights of Mother Earth, as being an integral part of its successful implementation” regarding its vision, mission, goals, and targets [83]. Over 200 laws and policies in nearly 40 countries have recognized that nature has inherent rights and that human society is responsible for protecting and stewarding nature in a manner consistent with the interconnected relationship between humanity and the environment [151-154]. Finally, over ten UNGA Resolutions on “Harmony with Nature” (2009-2022) call for “holistic approaches to sustainable development that will guide humanity to live in harmony with nature,” such as the Rights of Nature [155].</p>

**Polluter Pays
Principle**

78.8%

The Polluter Pays Principle (PPP) should be integrated into the GPT to ensure accountability and encourage sustainable development. This principle dictates that polluters bear both the “costs of pollution prevention and control measures” as well as the cost of damages they cause [156]. By incorporating the PPP into the GPT, the treaty can guide sustainable development by holding polluters responsible for their environmental impact and incentivizing them to avoid future damage. Originating from the OECD in 1972 and enshrined in Principle 16 of the Rio Declaration on Environment and Development, the PPP “constitutes the ‘internalization’ of negative environmental externalities,” ensuring that those who produce pollution also bear the associated costs [143,157,158].

In conclusion, principles provide foundational guidance at national and sub-national levels, reflecting the “collective intentionality” of governments to address obligations cooperatively [159,160]. The subsequent sections focus on key binding articles of the GPT, chosen for their critical relevance to ocean justice across Emissions and Releases, Microplastics, and a Just Transition. These sections offer conceptual analyses, textual recommendations, and applicable case studies.



Emissions and Releases of Plastics

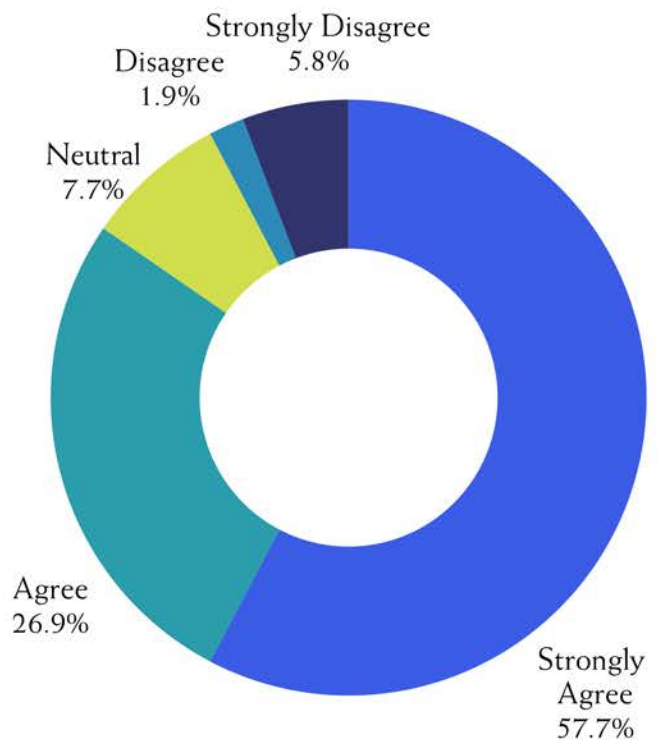
The full lifecycle of plastics is responsible for the release of hazardous chemicals, plastic polymers, microplastics, and plastic feedstocks, coupled with the emissions of greenhouse gases (GHGs) [161]. These externalities harm human and environmental health, exacerbating injustices when intersected with systems of power, such as social constructs of race, class, or gender. For example, refineries are often disproportionately located within low-income and POC communities and “emit several types of toxic chemicals, including benzene, formaldehyde, hydrogen sulfide, sulfur dioxide, and sulfuric acid” [45,162].

Alarmingly, according to UNEP, the plastic lifecycle acts as a barrier to achieving all 17 Sustainable Development Goals adopted by every United Nations Member State in 2015 [45].

Emissions and releases substantially contribute to climate change and impact the ocean across the lifecycle of plastics. Preventing and eliminating plastic releases into the environment are critical to mitigating injustices and reducing the disproportionate health outcomes burdening marginalized communities. For instance, releases from oil extraction, plastic production, plastic products, waste management, and recycling cause severe health issues, particularly for frontline communities and industry workers, including cancer, leukemia, and chronic bronchitis, among other impacts [129]. As illustrated in Figure I, 84.6% of survey respondents were in support of the GPT preventing injustices to marginalized communities, such as Indigenous Peoples, informal workers, Small Island Developing States, and the Global South.



Figure I Response: The GPT Should Include a Core Obligation to Prevent Injustices to Marginalized Communities





Contributions to Climate Change

The plastic industry further exacerbates environmental injustices by substantially contributing to climate change. Each year, the plastic lifecycle emits an approximated 1.8 Gt of GHGs (per 2019 data), and this data may be underestimated [163]. In fact, according to 2023 data, “plastics already represent an estimated 3-8% of current global GHG emissions” [164]. And, if growth trends continue, “plastic-related GHGs could *quadruple* by 2050,” with plastic production projected to “account for half of global oil demand growth” [164,165].

“Plastic is a climate change driver. If plastic production were a country, it would be the world’s fifth largest greenhouse gas emitter, beating out all but China, the U.S., India, and Russia” [167,168].

Data confirms that 94% of plastic-related GHGs are attributable to production, while downstream activities, particularly incineration, and landfills, additionally emit high levels of GHGs [45,165,166]. The interplay between emissions and releases of the plastic lifecycle is essential to mitigate because polluted plastic in the environment also contributes to GHG emissions. Given the undeniable role of plastics in exacerbating global climate change, the GPT must address the issue of plastic-related GHGs [164,165].

To stay within the 1.5°C warming target, one report estimates that plastic production needs to be reduced by 46-70% from 2019 levels, while another model states that a minimum of 75% reduction is necessary [165,169].

Given that 99% of plastic produced is derived from fossil fuels, and the urgency to timely phase out global carbon emissions, the Revised ZD must clarify whether Part II.8 on Emissions and Releases of Plastics includes GHGs. In reference to this provision, the “Options Paper” recognizes the role of plastics contributing to climate change:

In 2019, plastics generated 1.8 billion metric tons of greenhouse gas emissions – 3.4 percent of global emissions – with 90 per cent of those emissions coming from plastics production and conversion from fossil fuels [139].

This acknowledgment suggests that GHGs could be considered within this provision. As GHGs are a source of pollution, measures to phase out plastic-related GHGs across the lifecycle, generally or by sector, could be explicitly listed in an annex [161]. Part II.8 could support other control measures delineated towards GHGs within the GPT to synergize with the Paris Agreement—an imperative to avoid exacerbating the climate crisis and undermining the capacity of ecosystems, particularly the ocean, to act as carbon sinks [166]. Rather than duplicate other international instruments, the GPT “must complement the efforts of this [Paris] agreement to ensure a swift and effective reduction in emissions from plastics” [164]. As a result, this clarification is among the most critical for protecting the human rights of current and future generations.

In conclusion, the plastic industry is growing and fundamentally connected to climate change. In fact, in the U.S., the “plastics industry’s contribution to climate change will exceed that of coal by the year 2030” [167]. To realize a circular economy of plastics, the GPT must “minimize the overuse of resources as well as limit carbon emissions, waste, and pollution” [170]. Collectively, there is sufficient evidence to adopt the precautionary principle in preventing and eliminating emissions and releases, thereby advancing ocean justice.

Ocean Impacts

Despite the vastness of the ocean, covering 70% of the Earth's surface area, even the most remote corners of the ocean are tainted by toxic chemical additives used in plastic production [30]. Evidence of this contamination reaches unprecedented depths, with plastics and plastic additive chemicals discovered as deep as 10,898 meters in the Mariana Trench. The alarming scale and severity of plastic pollution poses a significant threat to the marine environment, exemplified by phenomena like the Great Pacific Garbage Patch, which spans an area three times the size of France and contains an estimated 1.8 trillion pieces of plastic, weighing approximately 80,000 tons [171,172]. Moreover, the intricate interactions between plastic additives and other pollutants in marine ecosystems remain poorly understood, perpetuating uncertainty regarding their ecological impacts.

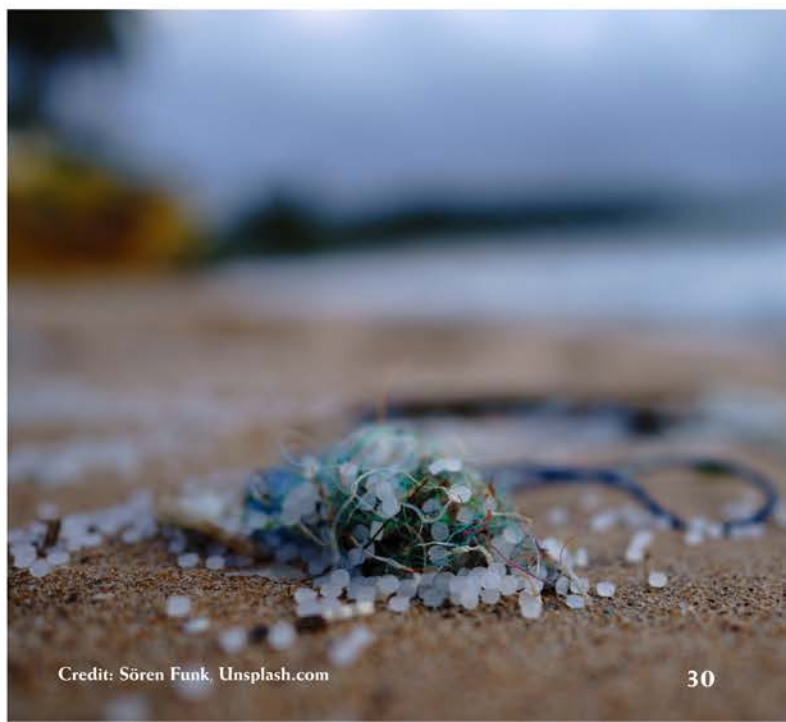
However, compelling evidence indicates marine life bears the brunt of plastic chemical pollution, suffering adverse effects at various levels, from cellular damage to population decline [44]. Exposure to EDCs, for instance, contributes to global biodiversity loss across numerous species. MPs, prone to bioaccumulation up the foodchain, also serve as vectors for persistent organic pollutants (POPs), amplifying their concentration in marine environments and posing further threats to marine organisms. Baleen whale species, for example, ingest MPs through their planktonic prey, introducing harmful substances, such as phthalates, into the food chain.

Moreover, one study revealed that MPs released into the ocean can re-enter the atmosphere, perpetuating their global dissemination and environmental impact [173]. The compounding effects of climate change exacerbate these challenges, amplifying the toxic impacts of plastic pollution on wildlife and increasing their vulnerability to diseases [161].

In particular, the ocean is heavily impacted by the leakage of plastic feedstocks into the environment. These feedstocks are considered

microplastics since they are less than five mm in size, and represent plastic pellets, flakes, and powders, with lentil-sized pellets, also known as nurdles, being the most common form [174]. They are the intermediary form of plastic after it is refined from oil and before it is melted into a plastic product. However, they can also be made from shredded post-consumer plastic, as a step in the recycling process [175]. MPs are frequently spilled during production or transportation, sometimes leading to catastrophic releases of thousands of metric tons into the ocean. One organization addressing this issue, The Great Nurdle Hunt, estimates that 445,970 metric tons (over 983 million pounds) of nurdles enter the environment each year [176]. Due to the transboundary nature of ocean currents, these nurdles, along with other substances and debris, are annually transported across the ocean, threatening biodiversity [177].

Consequently, marine life can incidentally ingest plastic, adding "persistent, bioaccumulative, and toxic substances to the aquatic food chain" [178]. For example, mollusks, being an indicator species, are often case studies for the hazards of plastic chemicals and toxins, and have been found to experience negative impacts following exposures, including "alterations of immunological responses, neurotoxic effects and the onset of genotoxicity" [44].



➔ Downstream Releases

Addressing plastic releases during downstream activities of the plastic lifecycle is essential to preventing and eliminating pollution. For example, Part II.8 mentions production and transportation but excludes connecting emissions and releases to waste management and recycling. Accounting for the communities that have the resources to manage plastic disposal, this waste is either incinerated or discarded in landfills, thereby releasing toxins into the air and soil, which subsequently harm nearby ecosystems and communities [82]. The recycling process additionally poses a host of hazards. Industrial recycling facilities expose workers and frontline communities to thousands of harmful chemicals, as well as MPs and NPs [66,138]. To address the downstream harms of releases, Member States can consider including waste management and recycling-related releases in Part II.8. Ample evidence reveals that the plastic

industry wields narratives that promise an end to plastic pollution via recycling—utilized as a tool to shift responsibility for plastic pollution from producers to individuals and waste mismanagement, while continuing ‘business as usual’ [20,66,80]. However, recycling is not an end-all solution. It is estimated that only 9% of plastic waste is recycled globally [49,177,179,180]. In 2021, 5-6% of plastic waste was recycled in the U.S. [181]. Dauvergne affirms: “To reduce plastic pollution with justice, policymakers will need to confront the extraordinary power of the petrochemical and plastics industries to influence politics, reshape discourses, construct doubt, divert blame, and obfuscate human rights abuses” [11].

To advance a just and equitable GPT, systems of power will need to be checked, avoiding false solutions that increase emissions of toxic and climate pollutants into the environment. Transformative solutions that prioritize waste prevention over reactive waste management will be more effective in protecting human rights [182]. According to UNEP, “The plastics problem is less an issue of consumption and proper disposal than one of the fundamental nature of plastics” [45]. By design, it is virtually impossible to completely and naturally break down plastic [57]. Therefore, efforts to “end plastic pollution” depend upon control measures to reduce plastic production [183].

Comprehensively, the risks of emissions and releases are a poorly understood and data-deficient realm of research. For example, critical gaps exist in understanding occupational exposures to chemicals “along the life cycle of plastics (including their management as waste), particularly in developing countries” [63]. Generally, chemicals are assumed safe until proven otherwise, allowing for unstudied and unregulated chemicals to enter the market [74].



It is imperative to obligate the prevention and elimination of emissions and releases to protect the Earth for future generations and advance ocean justice.

Table J presents various justice concepts within the context of emissions and releases. Textual recommendations for Part II.8 are provided thereafter.

Table J: Emissions and Releases and Concepts of Justice

Concepts of justice	Meaning in the context of emissions and releases	Examples of relevant questions to ask concerning Part II.8 in the Revised ZD
Recognition justice	Acknowledge and take action to mitigate the disproportionate burdens of emissions and releases on affected communities and ecosystems, including human health, the ocean, and future generations, given interconnections to climate change.	Does the article facilitate the inclusion of perspectives, narratives, knowledge, and values from marginalized and affected populations?
Procedural justice	Across the lifecycle, enable marginalized communities and affected populations to genuinely participate in decision-making processes to eliminate emissions and releases, ensuring actions are publicly available and transparent.	Are affected stakeholders provided with access to information and justice, and can they meaningfully participate in decision-making processes?
Distributive justice	Ensure an equitable distribution of costs and benefits when implementing laws and policies at different levels and determining responsibilities for addressing plastic releases. Additionally, ensure that the transition to environmentally sound fishing gear is achieved equitably.	Are the considerations of LDCs, SIDS, and other vulnerable communities accounted and provided for to enable the implementation of the article?
Intergenerational justice	Consider the intergenerational inequities regarding presented and underestimated plastic pollution, including unknown risks of MPs to human and environmental health.	Does the article include future generations as a vulnerable population or consideration under the provision to prevent and eliminate emissions and releases, including GHGs, into the environment?
Restorative justice	Ensure equitable access to justice and compensation for all stakeholders affected by emissions and releases.	Is there an obligation for polluters of plastic pellets, flakes, or powders to be held accountable and to repair or compensate for pollution?

Emissions and Releases Recommendations

This section presents policy recommendations for the emissions and releases article, Part II.8 of the Revised ZD. Though the article offers five options based on text proposals submitted by States at INC-3, the following recommendation includes the text proposed for **Option 1**, presented in italics, as it is the strongest and most comprehensive, along with recommendations and supporting rationales. Strongly supported text is in **bold**, and recommended deletions are in ~~strikethrough~~.

PART II.8 EMISSIONS AND RELEASES OF PLASTIC THROUGHOUT ITS LIFECYCLE

Option 1: Opening Paragraph and Subparagraphs

*1. Each Party, ~~based on studies of initial studies, vulnerability studies and assessment of levels of contamination of ecosystems,~~ shall ~~take the measures to~~ **prevent and ~~where feasible~~ eliminate the emissions and** **[to protect human health and the environment]** ~~take measures to control~~ releases of **[plastic polymers,] [chemical pollutants] plastics, including microplastics, and plastic products [across their life cycle], [including from extraction and production,]** to the environment from ~~[the] [from various] sources [that should be nationally determined]~~ **[identified in annex E]**, ~~with assessment of trends of the emissions and releases, taking into consideration technical feasibility and accessibility of alternative plastics and plastic products, and socio-economic impacts~~ **[according to the national circumstances and capacities of developing countries] [by the dates identified therein]**. The emissions and releases covered under this provision should include:*

*a. **[Emissions] [Releases] [of any plastic pollution] [of hazardous substances], including microplastics, to air [and in workplaces throughout the value chain of plastics];***

[b. Releases to soil and water from the production, transportation and use of chemicals [and polymers] of concern, plastics and plastic products [listed in part II of Annex A]; and]

[b][c. Releases of [chemicals and [monomers and] polymers of concern,] [of any plastic pollution] [plastics and plastic products] [listed in part II of Annex A], including microplastics, to air, soil, and water, [including the marine environment] and ecosystems.

Of Part II.8's five optional texts, **Option 1** is the strongest and most comprehensive. Legally binding language (i.e., "shall") is critical to this provision. Conversely, non-binding language (i.e., "should," "where feasible," "take measures to," or "that should be nationally determined") provides more leeway for Member States to weaken ambition and actions to manage emissions and releases. Soft language undermines the overall goal of mitigating plastic pollution and should be removed where possible. Member States, including New Zealand, PSIDS, the United Kingdom, Mauritius, and the Philippines, supported a legally binding article at INC-3 [184-188].

This provision is important to define emissions and releases included in this article. Specifying that Part II.8 includes all releases of plastic pollution, hazardous substances, and chemicals of concern is key to addressing the variety of substances released along the plastic lifecycle. For instance, including GHGs as an emission of plastic can be clarified within this section. In addition, the explicit recognition of the entire lifecycle of plastics as a source of emissions and releases is critical, as each stage poses unique threats to humans and the environment. As supported by New Zealand, this article should include specifying particular activities such as extraction and production, which are known to cause high emissions [184].

Further, the text "According to the national circumstances and capacities of developing countries" fosters **common but differentiated responsibilities and respective capabilities (CBDRRC)**. Plastic releases and emissions disproportionately burden LDCs and SIDS, while developed countries reap significant economic benefits from the plastic industry [11,45,81]. According to UNEP, "the increasing disconnection of economic benefits and ecological costs of the global economy has created opportunities for exploitation by more powerful actors from the Global North while also complicating the attribution of liability" [11]. **CBDRRC** addresses this disconnect by adjusting the burdens of responsibilities of different parties concerning their ability to address the provision, thereby instilling **distributive justice** within the provision's implementation.

Finally, the explicit inclusion of the marine environment in this provision is necessary to address the imbalanced burden of plastic released into the ocean. Estimates suggest that the global annual flow of plastics into the ocean is between 0.1 and 23 million metric tons [38,185,189]. Both Brazil and PSIDS support this text, with the latter confirming this reference is important because of the transboundary nature of plastic pollution in the ocean [185].

Proposed Additional Text

OP1b. bis. Spills of chemicals and other toxic exposures during extraction and production of plastics, as well as during production of chemicals used in plastics;

OP1b. ter. Minimization of microplastics generation and the generation of hazardous chemicals during the use and waste phases.

OP1 ter. Each Party should endeavor to adopt, as appropriate, and maintain national laws, regulations, or policies to address, within its national jurisdiction, adverse impacts on the environment or potential risks to human health linked to or caused by plastic pollution, taking into consideration any disproportionate impacts on persons in vulnerable situations. Each Party should endeavor to implement and enforce the national laws, regulations, or policies it adopts or maintains in accordance with this provision.

The above proposed additional provisions should be included within the article to address chemical spills, toxic exposures (**OP1b. bis**), microplastics (**OP1b. ter.**), and risks to human health (**OP1 ter.**). Unnecessary language within **OP1 ter.**, such as “endeavor to” or “as appropriate,” should be removed as it further weakens a nonbinding provision. Extensive documentation confirms the high health risks faced by plastic industry workers and frontline communities during extraction, production, and waste management phases, confirming the necessity of these provisions [81,128,136]. Hazardous chemical exposure, accidents, and chemical spills can lead to lifelong health effects or death [126]. Plastic releases also pose immense risks to neighboring ecosystems, particularly water bodies and the ocean [190,191]. As discussed in the Microplastics section, MPs and NPs pose severe health risks to human and ecosystem health, and the GPT must minimize their generation.

Finally, the consideration of “any disproportionate impacts on persons in vulnerable situations” is a key starting point in embedding **recognition and distributive justice** in the article by acknowledging vulnerable communities and the disproportionate burdens they face. Member States could consider strengthening the text to suggest “addressing” or “mitigating” “any disproportionate impacts” rather than “taking into consideration,” as this would support a justice-centered provision to mitigate adverse effects on human health.

Additionally, Member States could consider expanding on **recognition justice** within this provision by including that “each party shall consider and take action to prevent and eliminate the disproportionate impacts posed by the emissions and releases of the plastic lifecycle upon vulnerable populations including Indigenous Peoples, People of Color, women and people who menstruate, frontline communities, Small Island Developing States, least developed countries, waste pickers, youth, and future generations.”

According to Dauvergne, “embedding... justice into a global plastics agreement is also going to require an explicit recognition that discriminatory outcomes and environmental injustices can occur inside marginalized communities across ethnicity, class occupation, age, and gender” [11]. As shown in Table G: Stakeholder Mapping, many identities intersect with the harms posed by the current plastic lifecycle. An explicit acknowledgment of the need to prioritize the rights and health of marginalized people is a stepping stone for the GPT to be a tool for environmental justice and sustainable change.

Second Paragraph:

2. Each Party ~~[shall [take [effective] [any necessary] measures to]] [is encouraged to]~~ **prevent** ~~[or reduce, with a view toward elimination] [and where [possible] [feasible]]~~ **[and eliminate] [emissions and] releases of [plastic pellets, flakes and powder]** ~~[plastic pollution]~~ from **production, storage, handling and transport**, taking into account, as appropriate, ~~[the] relevant [provisions and guidance agreed in] [efforts undertaken within]~~ the framework of international organizations such as the International Maritime Organization.

Legally binding language is essential to reinforce efforts in preventing and eliminating emissions and releases of plastic pellets, flakes, and powder. Prioritizing terms like “prevent” and “eliminate” over “reduce, with a view towards elimination” will enhance the effectiveness and application of the GPT. This provision is vital for mitigating the harms of plastic leakage into the environment, particularly the ocean, and protecting human rights to health in occupational hazards.

Billions of pellets enter the ocean annually, constituting the second-largest source of microplastic pollution. Maritime pellet disasters have resulted in catastrophic spills. Notably, in May 2021, the container ship MV X-Press Pearl caught fire and released approximately 84 billion pellets into the Indian Ocean off the coast of Sri Lanka, marking the largest spill in history [192].

Third Paragraph:

3. *The measures taken to implement the provisions of this article ~~are encouraged to~~ [shall] be reflected in the national plan [communicated pursuant to [Part IV.1 on national plans]], with necessary means of implementation taking into account the special circumstances of small island developing States].*

The binding obligation to reflect actions taken to implement this article is necessary to foster **procedural justice**, which requires “political processes and stakeholder consultations to be transparent, accessible, and accountable” [11]. Additionally, as supported by PSIDS, to advance an equitable approach to implementation, this provision should include the consideration of SIDS’ special circumstances [185]. By considering how SIDS disproportionately are burdened by the consequences of plastic pollution, like impacts on tourism and sustenance, this acknowledgment embodies **recognition justice and distributive justice**—ensuring that SIDS are provided with technical and financial resources and capacity-building for implementation.

Option 2: Paragraph 3:

3. *Each Party shall cooperate and take effective measures across the whole lifecycle of fishing and aquaculture gear to prevent, reduce and eliminate, abandoned, lost or otherwise discarded fishing and aquaculture gear and promote circularity, taking into account internationally agreed rules, standards and recommended practices and procedures. In particular, Parties shall take measures to:*

1. *Enhance the design of fishing and aquaculture gear, with a view to increasing durability, reusability, repairability and refurbishability and their capacity to be repurposed, recycled, and disposed of in a safe and environmentally sound manner at end-of-life, and minimising releases and emissions of or from fishing and aquaculture gears, including microplastics, to the environment;*
2. *Implement effective marking of gears and require reporting of lost gears, taking into account other relevant regional and international regulations, including MARPOL Annex V;*
3. *Facilitate the collection and environmentally sound waste management of gear, including the reuse, repair and recycling of gear; and*
4. *Promote and facilitate training, education and awareness-raising.*

The above language from **Option 2: Paragraph 3** (also noted within Part II.9 Option 2) should be included in the final article, so that Part II.8 contains comprehensive language on fishing and aquaculture gear. Such text is otherwise missing from **Option 1**. This provision, suggested by the United Kingdom, explicitly provides control measures to decrease marine pollution from fishing and aquaculture activities, a major source of plastic pollution entering the marine environment: estimated to total 1.14 Mt each year [186,193]. This provision must be included to effectively protect the ocean and, collectively, advance ocean justice. Considering control measures for this vector of plastic pollution individually is necessary, as it requires such specialized approaches compared to other sources of plastic leakage into the environment.

Case Study

EFFECTS OF PLASTIC PRODUCTION ON INGENIERO WHITE

Ingeniero White, a port town adjacent to Bahía Blanca in the Buenos Aires Province of Argentina, once thrived as a fishing center. However, it has been transformed by an immense petrochemical complex where dozens of international companies converge to produce a myriad of petrochemicals, including several for plastic production like granulated urethane, polyurethane, polyvinyl chloride, and phenol [194-197]. Initially built in 1981 as El Complejo Petroquímica Bahía Blanca, the complex became privately acquired in the 1990s [198]. Over its lifetime, it has expanded from its six original factories to include an ethane and hydrocarbon production plant, an ammonia fertilizer plant, and a regasification vessel [198]. It is one of the biggest petrochemical complexes in South America and the largest in

Argentina [199]. The privatization of the coast has restricted public access to the sea and beaches, polluted the surrounding area, and, as one resident states, turned Ingeniero White into a “ghost town” [194]. Research indicates the entire estuary is polluted, with fish in the area found to have 40 times the legal limit of heavy metals, rendering them inedible and causing a significant decrease in the fishing industry [194]. The estuary is considered a “sacrifice zone” [199]. Environmental pollution affects the livelihoods of fishers and poses health risks to the local population. In fact, an epidemiological study of the entire city of Bahía Blanca found that those living in Ingeniero White were at much greater risk of developing asthma, rhinitis, skin diseases, and hearing loss [200]. A separate study found poor air quality within Bahía Blanca, particularly near the petrochemical hub [201].

In 2000, a massive chlorine leak created a yellow cloud over the complex, narrowly avoiding catastrophic consequences due to the direction of the wind [194]. Leaks, explosions, and accidents continue to this day, with reports arising that these companies are cutting corners in their safety measures [202,203]. From 1985 through 2018, there have been 31 recorded deaths from work accidents at this petrochemical complex, often attributed to “human error,” despite pushing workers to their limits with 12-hour shifts and often ignoring safety warnings to avoid delays [198].

Since 1982, there have been several movements, protests, conflicts, and legal cases from the local community, with little progress in changing the harmful actions of these petrochemical facilities. Governmental legal processes typically have slowed progress, dragging them on [198]. One case advocating for 52 fishermen has been ongoing for 10 years while the facilities continue to pollute the estuary [194]. Corporate responses to protests and movements’ demands typically involve community amenity donations, gatherings, and an open-door policy to improve their image and deactivate opposition. Rather than addressing pollution harms, these resolutions waste the public’s time with community gatherings that otherwise could be spent organizing and provide an illusion of listening through the open-door policy [198]. Consequently, these companies are still polluting the surrounding environment and creating unhealthy living and working conditions for those nearby.

This case serves as a localized illustration of the detrimental impact of emissions and releases of plastics from production facilities on vulnerable communities, highlighting the urgent need for their elimination across the entire lifecycle. Advancing a just and equitable treaty is crucial for safeguarding the ocean and human communities from these harmful consequences. A GPT that embeds justice throughout can help prevent injustices like these in the future.



Microplastics

The comprehensive regulation of microplastics (MPs) is critical to realizing an equitable GPT. Primary MPs are intentionally added to products (15–35% of MPs in the oceans), while secondary MPs photodegrade (69–81% of MPs in the ocean) from larger pieces into micro- and nanoplastics less than five mm in size. An estimated 98% of microplastic pollution in the ocean originates explicitly from land sources [11,96,204,205]. Thus, mandatory control measures for reducing intentionally added MPs and addressing existing oceanic MPs, including in areas beyond national jurisdiction, are critical for the GPT to advance ocean justice [38,68]. MPs are extensively documented to harm both the ocean and people, especially marginalized communities.

While the subsequent section delves into microplastics (MPs), it's crucial to underscore that nanoplastics (NPs), due to their smaller size, pose even greater risks and therefore merit thorough consideration under Part II.3. Nanoplastics range from 1-100 nm and are receiving increased research attention due to their heightened risks to human and environmental health. Primary NPs are intentionally manufactured for various applications such as clothing fibers, cosmetics, and NP beads in shampoos or toothpaste, while secondary NPs are released from sources like tires, fibers in laundry wastewater, runoff, or the degradation of plastic waste into tiny NP fragments. However, extensive research on NPs, their impacts, chemical interactions, and potential solutions are needed [206]. The following sections detail the particular threats of MPs to human rights and the ocean, connecting to concepts of justice, followed by textual recommendations for Part II.3 of the GPT.



Impact on Human Rights

MPs threaten a wide array of human rights, including the right to a clean, healthy and sustainable environment, and the right to food, clean water, and physical health. MPs and chemical toxins, via the breakdown of

microplastic waste, are released into the ocean, soil, groundwater, and air throughout the plastic lifecycle. As researchers have increasingly recorded MPs throughout the human body, found in tissues, lungs, blood, kidneys, and the placentas of newborn babies, there is a strong argument for the adoption of a precautionary approach to limit the production and use of plastics [64,207]. Additionally, the risks of plastic use concerning human health are a growing area of research. For example, surmounting evidence points to the hazardous chemicals of plastic containers having the potential to filtrate the food within [208].

While there is limited data on the severity of plastic harm to humans following the consumption of sealife, MPs have been found in both fresh and saltwater fishes worldwide [209]. In fact, marine plastics are known to “accumulate toxins and host distinct microbial communities,” aggregating toxins up the food chain through the process of bioaccumulation [26,45,210]. As a result, communities most reliant on seafood for sustenance and as a source of protein, representing approximately three billion people, are disproportionately impacted, such as SIDS [67,211,212]. In addition, seabirds represent a key species for several Indigenous communities worldwide in both cultural and sustenance practices since time immemorial. These communities are at risk of high concentrations of plastic pollutants from seabirds consuming marine wildlife [209].



Further, NPs pose a heightened risk compared to MPs due to their smaller size, enabling NPs to enter living cells and potentially inflict widespread harm on organs and tissues. NPs can also “absorb and transport other toxic substances, such as heavy metals and organic pollutants, posing additional risks to ecosystems, organisms,” and humans [206].

“The same properties that make plastics so useful — their durability and resistance to degradation — also make them nearly impossible for nature to completely break down” [57].

Despite these risks, research on the impacts of MPs and NPs on the human body at a subcellular or molecular level remains limited [206,213]. Comprehensively, if plastic production and pollution trends continue, future correlated impacts of MPs and NPs on food security, coastal economies, and human health will occur [123].

Endangerment to marine life

Plastics can photodegrade in the ocean for thousands of years, some particles never entirely breaking down. During the photodegradation process, plastic becomes less buoyant and sinks to the seafloor, which can cause dead zones and hypoxia [178]. Presently, an estimated 170 trillion fragments of plastic microparticles are in the ocean. MPs have been documented in over 100 marine species, including zooplankton, whales, crabs, sea reptiles, and sea birds, among others [123].

For example, the seabird Fulmars (*Fulmarus glacialis*) “are estimated to reshape and redistribute about 6 tonnes of MPs annually” [44]. Additionally, there is evidence of maternal transfer of pollutants derived from plastics, transferring to eggs of seabirds. In fact, it is predicted that by 2050, 99% of seabirds will have consumed plastic [50].

Plastics of varying sizes can be digested by marine wildlife, but MPs and NPs are particularly concerning “due to their ease of ingestion” [214]. For example, MPs have been documented to reduce “the growth of offspring and survival and fecundity” of crustaceans, and NPs have been found to penetrate embryo walls of fish, transferring to their offspring [44,123,215,216].

Research further indicates the consequences of consumption to marine wildlife include “damage to the digestive system, reduction in predation efficiency, and induction of toxic effects” [217]. As MPs bioaccumulate, predatory species are then at heightened risk [26,45,210]. In fact, predators are estimated to ingest the most plastic from their prey intake [217]. Thus, human communities commonly consuming top marine predators are also more likely to consume a higher proportion of MPs. The PSIDS claimed in a statement at INC-3, that “by prohibiting the production and use of intentionally added MPs, we can meaningfully contribute to global efforts to reduce the long-term health and environmental impacts of plastic pollution” [185]. As plastic is a vector for toxins, it also can transport invasive species across ecosystems or traverse toxins through marine ecosystems, threatening biodiversity [178].



Undeniably, a justice-centered approach is essential for the phase-out of MPs and NPs and the protection of human and ocean health. As depicted in Table K, justice concepts can be

interwoven and applied within the context of MPs, and in particular to the relevant articles to regulate MPs in the GPT.

Table K: Microplastics and Concepts of Justice

Concepts of justice	Meaning in the context of emissions and releases	Examples of relevant questions to ask concerning Part II.8 in the Revised ZD
Recognition justice	Explicitly recognize the environmental injustices MPs cause across marginalized communities and ecosystems.	Do the articles explicitly acknowledge the disproportionate impact and environmental injustices that occur to diverse populations and meaningfully consider their perspectives and knowledge?
Procedural justice	Ensure transparency and access to information of measures taken to end production, sale, distribution, etc. of MPs, while increasing transparency and plastic literacy of known or potential risks of MPs; increase genuine participation and active consultation of impacted communities in the treaty process and decision-making.	Do affected stakeholders have access to information and justice and can they meaningfully participate in decision-making?
Distributive justice	Strongly apply the precautionary principle by prohibiting the production of intentionally added microplastics while providing financial support and capacity building for Parties most burdened by MP pollution and with the least technical or financial resources to end production.	Do the articles ensure a fair distribution of costs and benefits to meet the MP obligations? Which Parties can be granted exemptions, and under what circumstances or guidelines?
Intergenerational justice	Consider the intergenerational injustices resulting from the buildup of microplastic pollution in the ocean and among marginalized and frontline communities when implementing actions at local, regional, and national levels, and enhance measures progressively as new data, risks, or advancements emerge.	Do the articles allow the interests of future generations to be considered, and mitigate the impact of MPs on future generations?
Restorative justice	Align measures to address MPs with the polluter pays principle, committing “to prevent and cooperate in response to acute plastic pollution events such as accidental spills of plastic pellets, and hold polluters responsible for mitigation, remediation and compensation for any pollution events” [218].	Is there an obligation or commitment for Parties to be held accountable to MP pollution, repairing or compensating adversely affected ecosystems and communities? Can Parties be held accountable to any granted exemptions?

Microplastics Recommendations

The remainder of this section presents policy recommendations for MPs across the GPT, primarily to Part II.3 provision (b.) of the Revised ZD. Though the article offers five options based on text proposals submitted by States at INC-3, the following includes the text proposed for **Option 1**, shown in italics, as it is the most robust proposal. The recommendation additionally covers other applicable articles to MPs, including Part II.4 on exemptions, Part IV.4 on monitoring, and Part IV.8 on stakeholder engagement, along with recommendations and supporting rationales. Strongly supported text is in **bold**, and recommended deletions are in ~~strikethrough~~.

PART II.3. B. INTENTIONALLY ADDED MICROPLASTICS

Option 1: Opening Paragraph

*1. Each Party shall **[not allow the production, use in manufacturing, sale, distribution, import or export of plastics and]** ~~take the necessary measures to regulate the use of plastic products~~ products containing intentionally added microplastics, except where an exception is specified in part IV of annex B. **[Each Party shall be encouraged to take any necessary measures to prevent the leak of unintentionally released microplastics into the environment.]***

Of the five option texts, **Option 1** contains the strongest legally binding language that sets a global restriction to MPs. Soft language like “take the necessary measures to regulate the use of plastic products” (Opt. 1) or “restrict and, where appropriate, not allow” (Opt. 2) suggests voluntary action and should therefore be excluded. In addition, clear definitions and parameters for “microplastics” and “intentionally added microplastics” must be included in the GPT to ensure uniform adherence and cover the full diversity of microplastic materials (e.g. pellets, powders, microbeads, and other particles) [219].

There is abundant data to determine that MPs pose significant harm to people, the ocean, and the broader environment. Simultaneously, significant knowledge gaps exist on the scale and severity of these harms, which necessitates a stringent application of the precautionary principle. In this respect, nationally determined phasedowns and reductions would not support justice and the highest protection for people and the ocean. For example, voluntary measures will not support ending “marine pollution from the synthetic clothing and synthetic tire industries, the two biggest sources of primary microplastic pollution” [11]. Moreover, the language that suggests Parties should first identify or establish risks (Opt. 3) before enacting a “phased reduction” is not justice-centered. Therefore, binding obligations for Parties are necessary to address the planetary MPs crisis, including for mitigating the unintentional releases of plastics, whereby “each Party shall take” necessary measures is preferred instead of “shall be encouraged to take.” Non-exhaustively, some stakeholders that support legally binding restrictions include IPMG, PSIDS, Thailand, Panama, Monaco, and Sri Lanka [88,185,220-223].

Proposed Additional Text

OP1 bis. *The measures taken to implement this provision **shall** be reflected in the national plan communicated pursuant to [Part IV.1 on national plans].*

OP2 bis Alt. 2 *Each party **shall** share information on the measures taken pursuant to paragraph [11] through the online registry established under [Part IV.6 on information exchange] with the aim of promoting transparency.*

3bis. Micro- and nanoplastics

The proposed text, **OP1 bis** and **OP2 bis Alt. 2**, should be included to immediately follow **Option 1**. To increase transparency and access to information, actions taken to implement this article must be inherent to national plans, and subsequently, this information must be shared via the online registry. These steps are critical to implementing **procedural justice**, ensuring decision-making and actions by States are “transparent, accessible, and accountable” [11]. Additionally, **3bis.** text specific to NPs should be explored, with NPs being further integrated and explicitly mentioned throughout this obligation.

PART II.4 EXEMPTIONS AVAILABLE TO A PARTY UPON REQUEST

Option 1

Option 1 1. Any Party may register, in accordance with the provisions of [Part II.1, Part II.2] and [part II.3 [on problematic and avoidable plastic products, including short-lived and single-use plastic products and intentionally added microplastics, Option 1]] an exemption from the phase-out dates listed in part II in annex B for specific products, hereafter referred to as an “exemption”, in accordance with the procedure [set out in ...].

OP1 bis The register of any exemptions and any extensions to an exemption shall include the name of the Party to which the exemption applies and the period of the exemption. The register shall be kept updated by [the governing body*] and **shall be publicly available**.

OP4 bis 2. Clear procedures on granting of exemptions and the implications on non-compliance must be further discussed and clearly outlined under this provision. The exemption may be granted by the governing body*. The procedures as well as decision made by the governing body* through a verification and validation body (VVB) must be **transparent, unbiased, and backed by scientific evidence**, taking into account a country’s unique circumstances.

If exemptions as proposed are included, they must follow a highly stringent developed guideline and procedure, in which the decision-making authority and provisions for non-compliance are determined (e.g. recommended by Malaysia, Sri Lanka, and Panama) [221,223,224]. In addition, any exemption proposed must provide a substantive burden of proof and be approved on a case-by-case basis with time-limited constraints and defined management plans, “ensuring that Parties don’t indefinitely postpone phase-out dates, maintaining pressure to find alternatives” [185]. Malaysia stated decisions on exemptions should be made “through a verification and validation body” and must be “transparent, unbiased, and backed by scientific evidence” [224].

In keeping with the spirit of the objectives and scope of the GPT, exemptions could be allocated on a strict set of criteria and primarily available only to countries with the fewest technical resources and lowest capacity to efficiently initiate reductions and phase outs, such as LDCs or SIDS. In this respect, the article will uphold **distributive justice** by leveling the playing field for countries that have the least capacity to meet the obligation. Still, financial and technical capacity will be integral to avoiding exemptions as much as possible. In fact, exemptions may be more applicable regarding “applications that are necessary for the functioning of society” like medical uses [161]. Therefore, Member States should avoid exemptions for intentionally added MPs. Any gaps left in this article or weakening text could open the doors for delaying action and sustaining business as usual. Exemptions, such as Brazil suggested in Contact Group 1 at INC-3, should not be nationally-determined [225]. Finally, any registered and awarded exemptions should be publicly available to ensure transparency.

PART IV.4 PERIODIC ASSESSMENT AND MONITORING OF THE PROGRESS OF IMPLEMENTATION OF THE INSTRUMENT

[b][c.] Review of [hazardous] chemicals [and polymers] of concern, microplastics and problematic and avoidable products[, and non-plastic substitutes]

Option 1

The governing body* shall conduct, [based on the request of the parties or relevant research associations,] commencing [X] years after entry into force and at least every [X] years thereafter, a review of chemicals [and polymers] of concern used in plastic production, **intentionally added microplastics** and avoidable plastic products, [and non-plastic substitutes,] with a view to assessing the state of knowledge with respect to their identification, production and use by Parties, and **their impact on human health and the environment**.

In this section, Member States could consider adding that the governing body* in its review of intentionally added MPs and “their impact on human health and the environment” identify, research, and acknowledge harms to marginalized communities (e.g. Indigenous Peoples, SIDS, LDCs) and the marine environment [104]. This specification will advance **recognition justice**, ensuring acknowledgment and representation of vulnerable populations most impacted by MPs.

PART IV.8 STAKEHOLDER ENGAGEMENT

8bis. Health Aspects

1. Parties are encouraged to:
 - a. Promote the development and implementation of strategies and programmes to identify and **protect populations at risk, particularly vulnerable populations**, and which may include adopting science-based health guidelines relating to the exposure to plastic pollution, in particular **microplastics** and related issues, setting targets for their exposure reduction, where appropriate, and public education, with the participation of public health and other involved sectors;
 - b. Promote the development and implementation of science-based educational and preventive programmes on occupational exposure to plastic pollution, in particular **microplastics** and related issues;
 - c. Promote appropriate health-care services for prevention, treatment and care for populations affected by the exposure to plastic pollution, in particular **microplastics** and related issues; and
 - d. Establish and strengthen, as appropriate, the institutional and health professional capacities for the prevention, diagnosis, treatment and monitoring of health risks related to the exposure to plastic pollution, in particular **microplastics** and related issues.

This additional text should be included within Section 8, as it is critical to advancing justice for marginalized communities most affected by plastic pollution, particularly MPs. Identifying and taking actions to protect these vulnerable populations is key to both **recognition** and **distributive justice**, encouraging the increase of education and plastic literacy regarding risks and setting targets to reduce exposure. Finally, **restorative justice** is integrated in this text by promoting health-care services for the treatment and care of populations harmed.

Case Study

IMPACTS OF MICROPLASTICS ON PLANKTON AND OCEANIC CARBON CYCLE

Evolving research regarding the long-term effects of MPs on plankton populations and their functions in marine environments reveals potential disruptions to crucial oceanic processes and the global climate cycle. Phytoplankton, microscopic plants, and primary producers drifting in marine currents are vital to the marine food web and the planet, photosynthesizing to remove carbon from the atmosphere and producing an approximated 50% of Earth's oxygen [226-230]. Phytoplankton serve as a primary food source for zooplankton, microscopic animals, and secondary producers like krill, certain jellyfish species, and copepods. These organisms additionally play a critical role in sustaining ocean health.

MPs exhibit a tendency to be more buoyant and aggregate at surface or shallow levels, where phytoplankton and zooplankton are commonly found [228]. Research indicates MPs may adversely affect phytoplankton photosynthesis, food web structures, and nutrient cycling. Additionally, they can impact the "development and reproduction of zooplankton," altering their survival and mortality following chronic exposure [123,231,232]. For example, prolonged exposure to MPs led *Calanus helgolandicus*, a copepod species of zooplankton, to produce smaller eggs with reduced hatching success [233].

Studies have demonstrated that zooplankton can consume MPs and NPs, altering their diet and resulting in increasing algal blooms with cascading effects up the food chain [5]. The consumption of MPs also affects zooplankton waste production and modifies the sinking rates of zooplankton fecal pellets, which predominantly form marine snow, along with other organic matter [228,231]. Scientists hypothesize that, on a large scale, this trend could reduce the efficiency of crucial regulatory components in what is known as the biological carbon pump [228,230]. As plastic is more buoyant, the

consumption of MPs slows the sinking rates of pellets. During the remineralization process, where organic carbon transforms into inorganic carbon, releasing nutrients for phytoplankton to reuse, carbon is released at higher levels of the water column, consequently reducing the carbon normally stored in the deep sea. This disruption affects the ocean's capacity to sequester carbon, potentially impacting the global carbon cycle [166,215].

As the Earth's largest carbon sink, the ocean faces an increasing prevalence of plastic pollution, coupled with zooplankton's consumption of MPs, which may contribute to "an unquantified increase in atmospheric CO₂" [228]. This challenge is underscored by escalating GHG emissions from human activities, growing concerns about the biological carbon pump, and the additional stress of rising ocean acidification and temperatures, accelerating plastic breakdown [231]. For instance, the Mediterranean Sea, which accounts for 7% of oceanic biodiversity, is a region highly vulnerable to global climate change, warming 25% faster than the global average [231]. Here, studies found 56% of samples taken from the surface of the Mediterranean Sea, specifically those related to floating or drifting organisms (neustonic/planktonic), had microplastic particles [123].

Further studies indicate that the zooplankton consumption of MPs modifies oceanic oxygen levels [228]. Ocean deoxygenation harms biodiversity and ecological processes and can interact with increasing global warming in tandem [228,231,234]. For example, Kvale et al. found zooplankton grazing MPs could reduce the abundance of phytoplankton, causing more to sink as waste to the ocean floor, thereby reducing oxygen levels in deeper parts of the ocean as it breaks down and exacerbating already low-oxygen areas in some regions [231].

Ecosystems will experience impacts at varied rates, depending upon the levels of nutrients in the water, ecosystem structure, and physical or chemical impacts of climate change [228]. A holistic approach is imperative to understand the complexity and interchange of ecosystems, the biological carbon pump, and MPs [228,231]. Ongoing research, particularly on the impact of MPs to phytoplankton vis-à-vis "adaptation strategies, population dynamics, and toxicity," is essential [233].

Despite being a complex and evolving field, this case demonstrates the diverse impacts MPs pose to marine life, ocean health, and the carbon cycle. The risks of MPs underscore the need for a precautionary approach and a strong global obligation to cease the production of MPs and release of plastics into the ocean, thereby advancing ocean justice.



Just Transition

UNEP is clear: To solve the global problem of plastic pollution, the world needs to move away from unsustainable patterns of plastic production and consumption and embrace systemic change to achieve a circular plastic economy [235]. Several Member States also made this point at INC-3 [236]. While this transition is essential, it must be undertaken with care as it implies drastic changes for consumers and producers alike in all areas and levels of society. Indeed, because of its versatility, flexibility, lightness, and affordability, plastic has become an essential part of human life, used in our means of transport, furniture and utensils, clothing, sanitary ware, packaging, and food storage [237,238]. The transition must, therefore, be contextualized and implemented through realistic, socially supported transition plans and timetables [239].

A “just transition is important not only from an ethical perspective; it is also critical in ensuring the long-term sustainability of the transition process itself” [239].

The importance of a “just” transition was widely recognized at INC-3, where the vast majority of States explicitly called for its inclusion in the GPT [240]. Although widely supported, there is no universal definition of “just transition” yet. In the context of plastics, UNEP has referred to it as “the process of designing, promoting, and implementing actions to transition to sustainable production and consumption of plastics in a manner that is fair and inclusive of everyone concerned, including waste pickers and other workers in the plastics value chain, creating decent work opportunities and leaving no one behind” [235].

The Scientists’ Coalition for an Effective Plastics Treaty also emphasizes the notion of fairness and inclusivity, stating that a “just transition means ensuring that measures taken to end plastic pollution are fair, equitable and inclusive for all stakeholders across the plastic lifecycle by safeguarding livelihoods and communities impacted by plastic pollution and corresponding control measures” [241].

Even though a just transition is not a set of fixed rules but rather a vision and a process to be negotiated and implemented in a particular context, it is essential to agree upon common terminology to avoid miscommunication [235,242]. This terminology should be developed in collaboration with those particularly affected by the transition, such as workers throughout the plastics value chain, including the informal sector, to enable them to fully embrace the transition. The informal sector can indeed be expected to be one of the most affected by the transition, as it is estimated to be responsible for 58% of all plastic waste collected and recovered worldwide [235,243].

According to the International Labour Organization (ILO), a just transition involves maximizing social and economic opportunities while minimizing and carefully managing challenges [244]. It is also necessary to identify the opportunities and challenges posed by this transition to enable a just transition. This process will require the INC to adopt a multi-stakeholder and multi-, inter-, and trans-disciplinary approach, taking into account the uniqueness of all plastic functions and associated impacts [238].



Although strengthening and clarifying the concept is imperative, a just transition does not necessarily have to be defined in a stand-alone definition provision in the GPT. Indeed, the ambivalence of the concept may make it difficult to establish a fixed definition. However, it is essential to, at a minimum, clearly specify the essential elements that constitute a just transition in the substantive article dedicated to it (i.e., for the time being, Part II.12 of the

Revised ZD), thereby providing a common terminology. The aforementioned definitions of fairness and inclusiveness from UNEP and the Scientists' Coalition are particularly important. In addition, for the transition to be "just," it must also incorporate the element of justice and more specifically recognition, intergenerational, procedural, distributive, and restorative justice [13,239,245]. Table L conceptualizes these concepts of justice in the context of a just plastics transition.

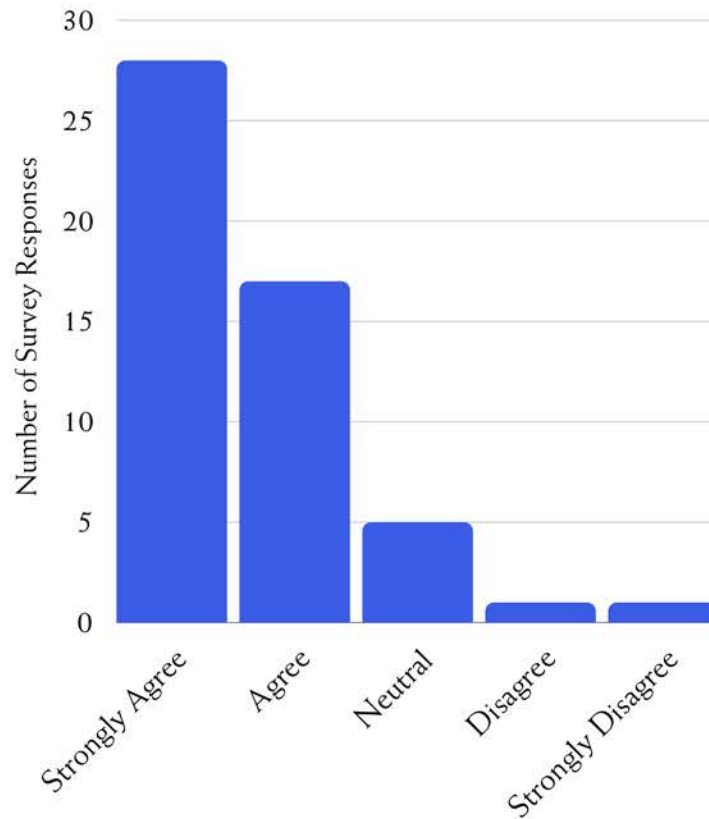
Table L: Just Transition and Concepts of Justice

Concepts of justice	Meaning in the context of emissions and releases	Examples of relevant questions to ask concerning Part II.8 in the Revised ZD
Recognition justice	Ensure that the needs, interests, and livelihoods of the various stakeholders affected by the transition are equitably recognized and represented [13,243].	Which stakeholders are covered by the GPT's just transition article? Does the article enable the perspectives, narratives, knowledge, and values of marginalized and affected populations to be considered?
Procedural justice	Ensure that all stakeholders affected by the transition can participate in decision-making and exercise their bargaining power effectively and equitably [45,82].	Does the article entail a mechanism for early and effective public participation in decision-making?
Distributive justice	Ensure that the costs and benefits of the transition are distributed in a fair and equitable manner [45,82].	Does the article imply an obligation for industries and developed countries to ensure the fair distribution of the costs and benefits of the transition?
Intergenerational justice	Anticipate and address the impacts on future generations that the transition will create [246].	Does the article allow future generations' interests to be considered? Does the article help mitigate the effects of the transition on future generations?
Restorative justice	Ensure equitable access to justice and compensation for all stakeholders affected by the transition [245].	Does the article allow for the resolution of transition-related conflicts? Does the article allow the situation and/or losses caused to vulnerable populations by the transition to be improved [247]?

Incorporating the elements of justice into the GPT's just transition article is essential to prevent the transition from undermining human rights and entrenching existing and historical inequalities [245].

Respondents of the online survey, as illustrated in Figure M, generally supported including justice in the GPT's just transition article.

Figure M Response: Justice is Part of Ensuring a Just Transition in the GPT



Just Transition Recommendations

The remainder of this section presents policy recommendations for the just transition article, namely Part II.12 of the Revised ZD. The article presents three options based on text proposals submitted by States at INC-3. While Option 2 acknowledges the particular situations of developing countries and their need for financing, capacity building, and technology transfer, **Option 1** is more comprehensive, better enabling the inclusion of concepts of justice and human rights. The following recommendation includes some of the text proposed for **Option 1**, presented in italics, along with recommendations and supporting rationales. Strongly supported text is in **bold**, and recommended deletions are in strikethrough.

PART II.12 JUST TRANSITION

Option 1: Opening Paragraph

"1. ~~[Leaving no one behind,] Each Party shall promote and facilitate [as per national circumstances and capabilities and relevant national regulation,] a fair, equitable and inclusive transition for affected populations, with special consideration for [for [Indigenous Peoples] and [local communities,] [waste pickers [and other workers in [plastic] [waste] value chains]] women [and vulnerable groups, including][impacted communities] children and youth, in the implementation of this instrument [in line with the International Labour Organization Just Transition guidelines] [according to national social policies and circumstances-] [, in the implementation of this instrument*] [, provided that means of implementation are available for developing countries]. This may include[~~according to national circumstances~~]."~~*

"OP1 Alt. In the implementation of this instrument, each Party shall promote an equitable and inclusive transition for affected populations, with particular consideration for workers and [persons] [people] in vulnerable situations, within [its national jurisdiction; This may include:]"*

Although the GPT's just transition article can hardly list every stakeholder likely to be affected by the transition, it is essential to recognize, in addition to the most marginalized (such as women, children, and Indigenous Peoples), those involved in waste management (especially waste pickers) and the plastics value chain (from those working in plastics production to consumers). The first proposal for the opening paragraph is therefore preferred, as opposed to OP1 Alt, as it is more inclusive and thus more able to embody **recognition justice**.

In particular, decision makers and regulators should pay particular attention to the informal sector, which is responsible for more than half of the plastic waste collected and recovered worldwide [235]. Despite the importance of their work, informal waste pickers remain largely unrecognized and operate in the most precarious conditions [235,248]. Member States could, therefore, consider mentioning the informal sector in the opening paragraph along the following lines: "(...) [waste pickers [and other workers in [plastic] [waste] value chains]], including in the informal sector (...)." In addition, it is important to recognize the impacts of the transition on current and future generations. An integration of **intergenerational justice** could be embodied in the reference to "leaving no one behind" or more explicitly stated by inserting "of present and future generations" after "children and youth."

Subparagraph (a)

*"a. Designating a national coordinating [body] [mechanism] for engagement **[and collaboration]** with relevant stakeholders, including public authorities, **[trade unions,] [workers association] [waste pickers,] non-governmental organizations[, Indigenous Peoples] and [local communities][and affected populations]** [according to national regulations] [with the aim of data collection, monitoring, evaluation and national reporting on progress of just transition];"*

This provision, and more specifically its reference to stakeholder engagement and collaboration, is critical to embodying **procedural justice**. As Schroeder and Barrie note, "enhanced citizen and stakeholder engagement is a way of introducing justice and equity dimensions in circular economy transitions and increasing social legitimacy" [246]. Engagement with relevant stakeholders should involve organizing transparent, accessible, and accountable consultations, providing clear and accurate information, and offering opportunities to participate in and influence the decision-making and implementation of all measures necessary to implement a just transition under the new treaty [246]. This provision could further reflect this aspect of **procedural justice** with the following addition: "with the aim of enabling public participation and access to information, data collection, monitoring, (...)."

Subparagraph (b)

"b. Enabling policies [and conditions][that integrate][to [ensure and] improve [as appropriate] income, opportunities and livelihoods for] [waste pickers and other workers in plastic value chains and] [impacted] [affected workers and] communities, including workforce training, [development and social programmes, enhancement of occupational health and safety measures] [according] [considering] to their needs and priorities;"

As previously mentioned, the transition to a circular economy of plastics will require radical changes in consumption and production behavior. Socio-economic status, particularly income and education, has a major influence on consumption behavior [237]. This provision, and more specifically, its focus on improving income, opportunities, and livelihoods, is therefore critical.

As Sharif and others argue, "by fostering education, not just in terms of degrees but in the contextual understanding of environmental stewardship, a paradigm shift in consumption patterns can be instigated" [237]. Member States could, therefore, consider adding "income, educational and professional opportunities, and livelihoods" to underscore the importance of education in this field. In addition, it is imperative that affected people and communities are consulted at both national and local levels, providing the opportunity to participate in the development of these policies and conditions as they best know their needs and priorities [246]. National governments should support local governments in implementing policies and adopting participatory, locally-adapted approaches. Finally, these measures should not be developed according to a one-size-fits-all approach, but should consider the people affected (especially those marginalized and in vulnerable situations) and the nature of their work (especially those involved in waste management and the plastics value chain). The measures should offer some degree of flexibility to accommodate differences in cultures and contexts, enabling people and communities to decide their pathways towards a circular plastics economy [243]. Doing so will make the transition more just and achievable, embodying **procedural and recognition justice**.

Subparagraph (c)

"c. Incentivizing the development of skills and job opportunities across the plastic value chain, including for the development of reuse, repair, waste collection and sorting;"

Inserting this provision is critical as the creation of "green/blue jobs" is essential to build socio-economic resilience against plastic pollution [249]. While all stakeholders involved in the plastics value chain must be considered in developing these skills and job opportunities, priority must be given to marginalized people (particularly women, people with disabilities, and Indigenous Peoples) and the informal sector, who are most in need of skills enhancement and access to employment. Indeed, as UN-Habitat and the Norwegian Institute for Water Research (NIVA) underline in their 2022 report, it is critical to use and strengthen skills, networks, and recovery capacities in the informal sector to reduce plastic pollution [243]. The development of these opportunities must also be contextualized and anchored at the local level, as capacities and needs differ from place to place [239]. Collaboration and engagement with local organizations and collectives is vital in that regard [239]. Job creation must also go hand in hand with fair remuneration. To better reflect this and embody **procedural and recognition justice**, Member States could consider amending the provision as follows: "Incentivizing the development of skills and job opportunities, with fair remuneration for all, across the plastic value chain, paying particular attention to the needs of the most marginalized and the informal sector, including for the development of reuse, repair, waste collection, and sorting."

Subparagraph (d)

"d. Promoting a [clean, healthy and sustainable] [safe working] environment [and a strong social safety net] [for communities and workers] across [the value chain, including [workers] in the waste management sector] [the full lifecycle in respect of the promotion of fundamental human rights];"

The reference to fundamental human rights is vital to a just transition that ensures plastic pollution reduction strategies do not run counter to the universal principles of **human rights** and decent work. In addition, the right to a clean, healthy, and sustainable environment for communities and workers throughout the plastics value chain should be added, to align the provision with the 2021 UN Human Rights Council and 2022 UNGA resolutions, and ILO Declaration on Fundamental Principles and Rights at Work, which recognizes the importance of a safe and healthy working environment [54,55,250]. Adopting human rights language in this provision is significant for workers in the informal sector, whose rights are often denied [243].

In addition, this provision must imply frequent monitoring, access to justice, and fair compensation for workers in the event of non-compliance with their right to a clean, healthy, and sustainable environment, thereby ensuring **restorative justice**. According to Dauvergne, "the treaty and national implementation plans are going to need to prioritize corporate controls, transparency, and accountability for any chance of achieving effective, justice-oriented global plastics governance" [11].

Subparagraph (e)

"e. [Improving working conditions [, occupational safety and health, and social protection] for [waste pickers and workers] in the waste management sector [, including by providing legal recognition and protection to [waste pickers and other] [workers [and waste pickers]] in informal and cooperative settings and facilitating the formalization [of their associations or cooperatives [integrating them into local waste management systems]] [of their activities through appropriate socioeconomic integration measures]];"

This provision is essential to protecting the human right to safe and healthy working conditions, particularly for waste pickers who often work in dangerous conditions and suffer from social stigmatization and discrimination [248,250]. This text is also necessary because of the benefits associated with the legitimization and formalization of the informal sector, such as greater social and legal protection, ability to organize, improved working conditions and livelihoods, higher incomes leading to poverty reduction, and improved collection services leading to a reduction in plastic pollution [251-253].

The formalization of the informal sector should be conducted per ILO Recommendation R204, which guides the transition from the informal to the formal economy [254]. This Recommendation emphasizes that when developing strategies to facilitate the transition to the formal economy, ILO Members should consider "the effective promotion and protection of the human rights of all those operating in the informal economy" and "the fulfillment of decent work for all through respect for the fundamental principles and rights at work, in law and practice" [254]. **Human rights** terminology in this provision, and particularly the importance of protecting labor rights and promoting the right of all workers to a safe and healthy work environment, would align with ILO Recommendation R204, as well as Sustainable Development Goal 8.8 and Environmental Justice Principle 8 from the First National People of Color Environmental Leadership Summit 1991 [255]. Member States could, therefore, consider adding at the end of the provision, "thereby recognizing and protecting labor rights and the right of all workers to a safe and healthy work environment." Finally, the reference to "legal recognition and protection" in this provision must also imply access to justice and fair compensation for workers to ensure **restorative justice**.

Subparagraph (f)

"f. [Integrating [waste pickers and other] workers in informal and cooperative settings into [a safe] plastics value chain, [including by requiring plastic product producers, recycling and waste management companies to integrate plastics collected and sorted by them into their operation schemes]]; and"

This provision is critical to ensure a safe circular economy for informal workers and waste pickers. It is all the more relevant as companies increasingly rely on waste pickers to meet their commitments to greater circularity of plastics [251]. To embody **distributive justice**, it is important to ensure that plastics collected and sorted by the informal sector are purchased at a fair price. Member States could, therefore, consider adding "at a fair price" at the end of the provision. The Nordic Council of Ministers even proposes including a "service fee" for the environmental service provided by the informal sector in collecting plastic waste, in addition to the material value of the recyclable products [248].

Subparagraph (g)

"g. [[Requiring] [~~Encouraging~~] a portion of the fees collected through EPR schemes to be used to improve infrastructure [and improve the] [,] livelihoods [, a strong social safety net,] and opportunities for, and develop the skills of, workers in the waste sector, including waste [pickers and other][workers] in informal and cooperative settings.]"

Financial resources will be needed to ensure a just transition, particularly in developing countries where the absence of infrastructure for appropriate waste management and the use of informal labor are common issues [256]. As UN-Habitat and NIVA note, EPR schemes seem to offer the potential to increase recycling rates while promoting the socio-economic interests of the informal sector [243]. To ensure a strong commitment to EPR, binding language, i.e. "requiring," is preferable.

Developing and using EPR based on **procedural, recognition, and distributive justice** is also critical. First, EPR schemes should be designed and operated with the full involvement of workers through participatory platforms created at all levels [257]. A participatory process would ensure that workers, and especially informal workers, are not left outside the scope of EPR and bridge the trust deficit between the parties paying into and implementing EPR schemes [258]. Second, while waste workers, and informal waste pickers in particular, should be given special consideration, EPR schemes should be inclusive of all stakeholders, accounting for the varying impacts on all workers, consumers, income groups, and local businesses [239]. As Talbott *et al.* point out, the design of an EPR system must be multi-stakeholder, requiring direct and ongoing communication and engagement with informal waste workers in the recycling value chain, waste pickers and relevant organizations, scrap dealers, aggregators, and recyclers [259]. Finally, EPR schemes should embody **distributive justice**, between and within States, ensuring that financial resources are directed towards communities lacking essential infrastructure and with a more informal workforce. As Schroeder and Barrie note, from a distributional point of view, the key question in the transition to a circular economy is how to support economic diversification and worker retraining [246]. Considering the difficulties faced by LDCs in this regard, Member States could consider adding, "with special consideration for developing countries" at the end of the provision [256].

Second Paragraph

"2. [The measures taken to implement this provision shall be reflected in the national plan [communicated pursuant to [Part IV.1 on national plans]]."

"OP2 ter. Within its jurisdiction, each Party shall encourage the consideration of socio-economic factors in determining the location, design, and construction of solid waste management facilities that manage plastic waste, with an aim of avoiding disproportionate and adverse impacts on [persons] [people] in vulnerable situations."

"OP2 quater. Each Party shall, in accordance with its domestic procedures, provide opportunities for members of the public to provide input on government plastic waste management decisions or measures."

This provision, with the text of **OP2 quater**, is critical to ensuring **transparency and procedural justice**, enabling those affected by the transition and the broader public to access public and transparent information within the national plans regarding the transition and measures taken to implement this GPT provision. Some communication could be mandatory, as UN-Habitat and NIVA suggest, for the targets and actions for the formalization and integration of the informal sector [243]. These elements could be mentioned in an annex to the GPT, as suggested in Part IV of the Revised ZD. The text of **OP2 ter** must also be included, and could be strengthened by replacing the phrase "each Party shall encourage the consideration of socio-economic factors" with "each Party shall consider socio-economic factors."



Case Study

A JUST TRANSITION FOR FISHERS AND FISHING COMMUNITIES

Fishing gear is produced from a variety of plastics, including polyamide, polyethylene, and polypropylene [260]. Abandoned, lost, or otherwise discarded fishing gear (ALDFG) has become a major cause of ocean plastic pollution [261]. Around 1.14 Mt of ALDFG are lost in the ocean every year, though this number is likely underestimated due to lack of data. Consequently, ALDFG causes the entanglement or killing of targeted and non-targeted species, including endangered and protected species, and damages the seafloor and coral reefs [262,263]. According to UNEP, ALDFG is the deadliest form of marine plastic pollution, threatening 66% of marine animals, including all species of sea turtles, and 50% of seabirds [264]. Therefore, a transition from current fishing methods is necessary if we are to tackle the plastic pollution crisis while protecting the ocean.

Multiple interventions to prevent and address ALDFG include the reuse, recycling, reorientation, and diversification of fishing gear, the development of an ALDFG management framework, and more curative measures such as the removal of ALDFG from the marine environment [260,264-266]. These interventions are reflected in Option 2 of Part II.9.b of the Revised ZD which, together with the need for financial resources, technology transfer, and knowledge exchange in Option 1, provides a good basis for negotiation. To ensure the success of these interventions, it is essential to understand the causes of ALDFG, as well as the behavioral components and beliefs that underpin fishers' behavior towards ALDFG [266]. As Gilman points out, the drivers of ALDFG and the ecological and socio-economic consequences vary considerably depending on gear type, region, scale, and fishery [265]. To initiate a just and sustainable transition from current fishing methods, it is essential to contextualize each case, consider environmental and socio-economic factors, and develop solutions in collaboration with fishers and fishing communities [261,265].

Solutions and initiatives have already been developed around the world and should be encouraged and disseminated. The work of the organization Enaleia with Greek fishers, for example, has been highlighted by UNEP as a success story in this field [264]. Enaleia is an organization active in Greece, Spain, Italy, Egypt, and Kenya that aims to make the marine ecosystem sustainable through circular and social economy solutions. It bases its work on three pillars:

- Education: training fishers in sustainable fishing techniques and ensuring higher income for fishing communities;
- Mitigation: implementing clean-up projects that involve fishing communities; and
- Prevention: preventing further pollution by encouraging fishers to hand in their used fishing gear on a regular basis [267].

INC Members can draw inspiration from Enaleia's approach, which focuses on a just transition that protects the ocean while empowering fishers and fishing communities, yielding positive results that embody justice and equity.



Credit: Toby Matthews, Ocean Image Bank

Appendices



Online Survey Methodology

To explore perspectives on spanning justice topics and human rights, Earth Law Center conducted an online survey, contacting a total of 1370 individuals via email. Contacts were identified through official statements to the INC by observers and Member States, as well as from the UNEP National Focal Points listing and ocean-focused NGO and academic connections. Thus, the sampling target audience included Member State representatives, Observers (NGOs, businesses, academics, etc.), and other expert stakeholders in oceans, plastics, or global governance. The survey, tailored specifically for this study, aimed to capture diverse viewpoints. The sampling population, primarily derived from official INC processes, may inadvertently exclude groups or individual experts outside of this formal channel.

The survey, hosted on Google Forms, remained open for 45 days. It featured both likert scale questions to gauge support levels and optional open-ended questions to elicit qualitative insights. However, it is crucial to acknowledge the limitation of the survey being conducted in English. Participation in the survey was inherently voluntary, and no incentives were provided to participants. At the beginning of the survey, participants were notified that it was their discretion to decide whether to add names and/or email addresses.

Results were anonymized, and the Report does not disclose any identifying information. In addition, participants could withdraw at any stage, and their data would be promptly deleted upon request. All data collected will be deleted following the publication of this Report. A total of 52 individuals responded to the survey, with follow-up emails sent to enhance response rates. The questionnaire comprised ten substantive questions and included three optional queries for feedback, contact information, and requests for the forthcoming Report.

Full Survey:

1. Which stakeholder group or association do you associate yourself most with?

- a. Business
- b. Nonprofit
- c. Academic
- d. Government

2. To what extent do you agree or disagree references to human rights should be included within the global plastics treaty?

- a. Strongly Disagree
- b. Disagree
- c. Neutral
- d. Agree
- e. Strongly Agree

3.*Open-ended: Please share your perspective on the potential ways, if at all, human rights could be considered or integrated into the global plastics treaty.

4. To what extent do you agree or disagree that the treaty should include a core obligation to protect the human right to a clean, healthy, and sustainable environment?

- a. Strongly Disagree
- b. Disagree
- c. Neutral
- d. Agree
- e. Strongly Agree

5. To what extent do you agree or disagree an environmental/social justice principle should be included within the principles of the global plastics treaty?

- a. Strongly Disagree
- b. Disagree
- c. Neutral
- d. Agree
- e. Strongly Agree

6. Please check any types of justice you agree should be considered for inclusion in the global plastics treaty (generalized definitions are included):

- a. Recognition justice: whose interests, values, and views are recognised and taken into account
- b. Distributive justice: the fair distribution of the burdens and benefits
- c. Procedural justice: fairness and equity in consultation, participation, and decision-making
- d. Intergenerational justice: moral considerations among generations
- e. Environmental justice: the fair distribution of the burdens and benefits with respect to the environment
- f. Restorative justice: repair to harm caused
- g. None of the above

7. *Open-ended: Please provide your insights on potential approaches, if at all, for integrating justice into any sections of the global plastics treaty.

8. Please check any principles you agree should be included in the global plastics treaty:

- Common but differentiated responsibilities and respective capabilities (CBDRRC)
- Indigenous Knowledge
- Free and Prior Informed Consent
- Just Transition
- Human Rights/Human rights-based approach
- Intergenerational Equity
- Intragenerational Equity
- Environmental/Social Justice
- Rights of Nature
- Polluter Pays Principle
- None of the above

9. To what extent do you agree or disagree that the global plastics treaty should include core obligations to prevent injustices to marginalized communities such as Indigenous Peoples, informal workers, Small Island Developing States, and the Global South?

- a. Strongly Disagree
- b. Disagree
- c. Neutral
- d. Agree
- e. Strongly Agree

10. To what extent do you agree or disagree that justice is part of ensuring a just transition in the global plastics treaty?

- a. Strongly Disagree
- b. Disagree
- c. Neutral
- d. Agree
- e. Strongly Agree

11. Please indicate if you would like to be contacted for the following:

- a. To receive the report once published
- b. To indicate interest in learning more about this project
- c. For other questions or concerns

12. If you checked yes to any of the above, please add your contact information here:

- a. Name
- b. Email address
- c. N/A

13. *Any other feedback, comments or questions:



Human Rights Map Methodology

Earth Law Center conducted a comprehensive review, featured on [page 13](#), to assess the support of Member States for including human rights in the GPT, totaling 376 documents across 175 countries. These documents comprised pre-submissions and official statements from INC 1, 2, and 3. The sampling methodology involved quick searches and finds for each document, rather than a complete read-through, to efficiently cover a substantial volume of material. Given the expedited nature of this process, the possibility of overlooking nuanced expressions of human rights exists, especially when Member States do not explicitly use standard human rights terminology. The mapping criteria were as follows:

1. **No Data:** Member States with no INC documents and not affiliated with any formal negotiating group.
2. **No Reference:** Member States that do not include or mention human rights in their documents.
3. **Explicit Support:** Member States that explicitly call for human rights, which includes instances where similar language is used, such as a human rights-based approach or the human right to a clean, healthy, and sustainable environment.
4. **Highest Support:** qualifying Member States for highest support status were those that made references to human rights in more than one INC document (e.g. two pre-submissions, a pre-submission and a formal statement (opening/closing), or two formal statements).

Finally, formal negotiating groups, such as the Group of Latin America and Caribbean (GRULAC), the African Group of Negotiators (AGN), the Alliance of Small Island States (AOSIS), and the European Union, were inherently included in the dataset. All aforementioned groups explicitly endorsed human rights.

Additionally, individual countries within these formal groups were designated as **Highest Support** if they not only belonged to these representative groups but also explicitly endorsed human rights within a minimum of one of their individual pre-submissions or formal statements. Two validation checks were performed on the dataset in the interest of data accuracy. Data extraction and coding were conducted in English, French, Spanish, and Portuguese using a search-and-find approach. For documents in Arabic or other languages, an online translator was employed, recognizing the potential for translation errors. No countries were found to be in explicit opposition to the inclusion of human rights. The mapping was conducted using Datawrapper, and results were visualized on a choropleth map. Numerical values were assigned to each qualification for clarity: No Data=0, No Reference=1, Explicit Support=2, and Highest Support=3.



References

1. United Nations. (2023, November 17). Hopes Rising for Historic Treaty to Curb Plastic Pollution | UN news. United Nations. <https://news.un.org/en/interview/2023/11/1143727>
2. Gardiner, B. (2020, July 16). Ocean Justice: Where Social Equity and the Climate Fight Intersect. Yale E360. <https://e360.yale.edu/features/ocean-justice-where-social-equity-and-the-climate-fight-intersect>
3. Armstrong, C. (2020). Ocean justice: SDG 14 and beyond. *Journal of Global Ethics*, 16(2), 239–255. <https://doi.org/10.1080/17449626.2020.1779113>
4. Deeney, M., Yates, J., Green, R., & Kadiyala, S. (2022). Centring Human Health in the Global Plastics Treaty: a Call to Action. *BMJ Global Health*. <https://gh.bmj.com/content/bmjgh/7/11/e011040.full.pdf>
5. Stoett, P. (2022). Plastic pollution: A global challenge in need of multi-level justice-centered solutions. *One Earth*, 5(6), 593–596. <https://doi.org/10.1016/j.oneear.2022.05.017>
6. Ergas, C., McKinney, L., & Bell, S. E. (2021). Intersectionality and the Environment. In B. Schaefer Caniglia, A. Jorgenson, S. A. Malin, L. Peek, D. N. Pellow, & X. Huang (Eds.), *Handbook of Environmental Sociology* (pp. 15–34). Springer International Publishing. https://doi.org/10.1007/978-3-030-77712-8_2
7. Landrigan, P., Symeonides, C., Raps, H., & Dunlop, S. (2023). The global plastics treaty: why is it needed?. *Lancet* (London, England), 402(10419), 2274–2276. [https://doi.org/10.1016/S0140-6736\(23\)02198-0](https://doi.org/10.1016/S0140-6736(23)02198-0)
8. Thomas, L. (2022). *The intersectional environmentalist: How to dismantle systems of oppression to protect people + planet* (First edition). Voracious/ Little, Brown and Company.
9. Ryder, S., & Boone, K. (2019). Intersectionality and Sustainable Development. In W. Leal Filho, A. M. Azul, L. Brandli, P. G. Özuyar, & T. Wall (Eds.), *Gender Equality* (pp. 1–11). Springer International Publishing. https://doi.org/10.1007/978-3-319-70060-1_51-1
10. Kaijser, A., & Kronsell, A. (2014). Climate change through the lens of intersectionality. *Environmental Politics*, 23(3), 417–433. <https://doi.org/10.1080/09644016.2013.835203>
11. Dauvergne, P. (2023). The necessity of justice for a fair, legitimate, and effective treaty on plastic pollution. *Marine Policy*, 155, 105785. <https://doi.org/10.1016/j.marpol.2023.105785>
12. Sabbagh, C., & Schmitt, M. (2016). Past, Present, and Future of Social Justice Theory and Research. In C. Sabbagh & M. Schmitt (Eds.), *Handbook of Social Justice Theory and Research* (pp. 1–11). Springer New York. https://doi.org/10.1007/978-1-4939-3216-0_1
13. Suboticki, I., Heidenreich, S., Ryghaug, M., & Skjølsvold, T. M. (2022). Fostering Justice Through Engagement: A Literature Review of Public Engagement in Energy Transitions. *Energy Research & Social Science*, 99. <https://doi.org/https://doi.org/10.1016/j.erss.2023.103053>
14. Detraz, N. (2017). *Gender and the environment*. Polity Press.
15. Njeru, J. (2006). The urban political ecology of plastic bag waste problem in Nairobi, Kenya. *Geoforum*, 37(6), 1046–1058. <https://doi.org/10.1016/j.geoforum.2006.03.003>
16. Elisse, R., Alexandra, P., & Christian, B. (2023, August 3). What is Environmental Justice? <https://www.carbon-direct.com/insights/what-is-environmental-justice>
17. Menton, M., Larrea, C., Latorre, S., Martinez-Alier, J., Peck, M., Temper, L., & Walter, M. (2020). Environmental justice and the SDGs: From synergies to gaps and contradictions. *Sustainability Science*, 15(6), 1621–1636. <https://doi.org/10.1007/s11625-020-00789->
18. Holifield, R. (Ed.). (2017). Procedural environmental justice. In *The Routledge handbook of environmental justice*. Routledge, Taylor & Francis Group.
19. Simon, N., Raubenheimer, K., Urho, N., Unger, S., Azoulay, D., Farrelly, T., Sousa, J., Van Asselt, H., Carlini, G., Sekomo, C., Schulte, M. L., Busch, P.-O., Wienrich, N., & Weiland, L. (2021). A binding global agreement to address the life cycle of plastics. *Science*, 373(6550), 43–47. <https://doi.org/10.1126/science.abi9010>
20. Owens, K. A., & Conlon, K. (2021). Mopping Up or Turning Off the Tap? Environmental Injustice and the Ethics of Plastic Pollution. *Frontiers in Marine Science*, 8, 713385. <https://doi.org/10.3389/fmars.2021.713385>
21. Stanford Encyclopedia of Philosophy. (2021). *Intergenerational Justice*. <https://plato.stanford.edu/entries/justice-intergenerational/>
22. Forsyth, M., Pali, B., & Tepper, F. (2022). Environmental Restorative Justice: An Introduction and an Invitation. In B. Pali, M. Forsyth, & F. Tepper (Eds.), *The Palgrave Handbook of Environmental Restorative Justice* (pp. 1–23). Springer International Publishing. https://doi.org/10.1007/978-3-031-04223-2_1
23. Forsyth, M., Cleland, D., Tepper, F., Hollingworth, D., Soares, M., Nairn, A., & Wilkinson, C. (2021). A future agenda for environmental restorative justice? *The International Journal of Restorative Justice*, 4(1), 17–40. <https://doi.org/10.5553/TIJRJ.000063>
24. European Forum for Restorative Justice. (n.d.). *Environmental Justice*. <https://www.euforumrj.org/en/environmental-justice>
25. Franklin, T. (2023, March 9). *The Plastic Problem: Moving from a linear to a circular economy*. <https://blog.policy.manchester.ac.uk/posts/2023/03/the-plastic-problem-moving-from-a-linear-to-a-circulareconomy/#:~:text=Our%20current%20linear%20model%20of,investing%20more%20in%20plastics%20research>
26. Tessnow-von Wysocki, I., & Le Billon, P. (2019). Plastics at sea: Treaty design for a global solution to marine plastic pollution. *Environmental Science & Policy*, 100, 94–104. <https://doi.org/10.1016/j.envsci.2019.06.005>
27. Bender, M., Bustamante, R., & Leonard, K. (2022). Living in relationship with the Ocean to transform governance in the UN Ocean Decade. *PLOS Biology*, 20(10), e3001828. <https://doi.org/10.1371/journal.pbio.3001828>

28. Ingersoll, K. A. (2016). *Waves of Knowing: A Seascape Epistemology*. Duke University Press. <https://doi.org/10.1515/9780822373803>
29. Harden-Davies, H., Humphries, F., Maloney, M., Wright, G., Gjerde, K., & Vierros, M. (2020). Rights of Nature: Perspectives for Global Ocean Stewardship. *Marine Policy*, 122, 104059. <https://doi.org/10.1016/j.marpol.2020.104059>
30. CIEL. (2019). *Plastic & Climate: The Hidden Costs of a Plastic Planet*. www.ciel.org/plasticandclimate
31. Boisseau, S. (2021, July 6). *How the Process of Making Plastic is as Harmful as Plastic Waste*. <https://ceh.org/yourhealth/how-the-process-of-making-plastic-is-as-harmful-as-plastic-waste/>
32. Cordes, E. E., Jones, D. O. B., Schlacher, T. A., Amon, D. J., Bernardino, A. F., Brooke, S., Carney, R., DeLeo, D. M., Dunlop, K. M., Escobar-Briones, E. G., Gates, A. R., Genio, L., Gobin, J., Henry, L.-A., Herrera, S., Hoyt, S., Joye, M., Kark, S., Mestre, N. C., ... Witte, U. (2016). Environmental Impacts of the Deep-Water Oil and Gas Industry: A Review to Guide Management Strategies. *Frontiers in Environmental Science*, 4. <https://doi.org/10.3389/fenvs.2016.00058>
33. Palmer, M. (2019). *The Dangers of Offshore Oil Drilling Revisited*. <https://savedolphins.eii.org/news/the-dangers-of-offshore-oil-drilling-revisited>
34. Cabernard, L., Pfister, S., Oberschelp, C., & Hellweg, S. (2021). Growing environmental footprint of plastics driven by coal combustion. *Nature Sustainability*, 5(2), 139–148. <https://doi.org/10.1038/s41893-021-00807-2>
35. Fidora. (n.d.). *The Great Nurdle Hunt: Tackling Worldwide Nurdle Pollution*. <https://www.nurdlehunt.org.uk/the-problem.html#:~:text=Nurdles%20can%20spill%20into%20the,and%20even%20plastic%20recycling%20sites>
36. Tunnell, J. W., Dunning, K. H., Scheef, L. P., & Swanson, K. M. (2020). Measuring plastic pellet (nurdle) abundance on shorelines throughout the Gulf of Mexico using citizen scientists: Establishing a platform for policy-relevant research. *Marine Pollution Bulletin*, 151, 110794. <https://doi.org/10.1016/j.marpolbul.2019.110794>
37. Yu, R.-S., Yang, Y.-F., & Singh, S. (2023). Global analysis of marine plastics and implications of control measure strategies. *Frontiers in Marine Science*, 10, 1305091. <https://doi.org/10.3389/fmars.2023.1305091>
38. Richon, C., Kvale, K., Lebreton, L., & Egger, M. (2023). Legacy oceanic plastic pollution must be addressed to mitigate possible long-term ecological impacts. *Microplastics and Nanoplastics*, 3(1), 25. <https://doi.org/10.1186/s43591-023-00074-2>
39. Scott, E. (2023). Mitigating ghost fishing. *Nature Reviews Earth & Environment*, 4(11), 737–737. <https://doi.org/10.1038/s43017-023-00499-6>
40. Sun, Y., Lin, Y., Steindal, E. H., Jiang, C., Yang, S., & Larssen, T. (2021). How Can the Scope of a New Global Legally Binding Agreement on Plastic Pollution to Facilitate an Efficient Negotiation Be Clearly Defined? *Environmental Science & Technology*, 55(10), 6527–6528. <https://doi.org/10.1021/acs.est.1c02033>
41. Fava, M. (2022). Ocean plastic pollution an overview: Data and statistics. <https://oceanliteracy.unesco.org/plastic-pollution-ocean/>
42. World Wide Fund for Nature. (2022). *Towards a Treaty to End Plastic Pollution*. https://wwfint.awsassets.panda.org/downloads/towards_a_treaty_to_end_plastic_pollution___final_report.pdf
43. Convention on Plastic Pollution Essential Elements: Fishing Gear. (2022). Environmental Investigation Agency. https://apps1.unep.org/resolutions/uploads/eia_-_essential_elements_-_fishing_gear_0.pdf
44. IPEN and The National Toxics Network. (2018). *Ocean Pollutants Guide: Toxic Threats to Human Health and Marine Life*. https://www.issuelab.org/resources/34109/34109.pdf?download=true&gl=1*hmp6u0*_ga*MzM0NDUwNTY4LjE2NTEwOTIyNTA.*_ga_5W8PXYXGBX*MTY1MTE5MjI0OS4xLjAuMTY1MTE5MjI0OS42MA._&_ga=2.119740936.1693987474.1651192250-334410568.1651192250
45. UNEP (2021). *Neglected: Environmental Justice Impacts of Marine Litter and Plastic Pollution*. Nairobi. <https://wedocs.unep.org/bitstream/handle/20.500.11822/35417/EJIPP.pdf>
46. NOAA. (2024). *The Mystery of How Long Until It's Gone*. [https://marinedebris.noaa.gov/discover-marine-debris/mystery-how-long-until-it-s-gone#:~:text=Plastics%20can%20fragment%20into%20small,away%20\(Photo%3A%20NOAA\)](https://marinedebris.noaa.gov/discover-marine-debris/mystery-how-long-until-it-s-gone#:~:text=Plastics%20can%20fragment%20into%20small,away%20(Photo%3A%20NOAA))
47. Kyushu University. (2022). *Visible ocean plastics just the tip of the iceberg*. <https://www.sciencedaily.com/releases/2022/03/220318092128.htm>
48. Carlini, G., & Kleine, K. (2018). Advancing the international regulation of plastic pollution beyond the United Nations Environment Assembly resolution on marine litter and microplastics. *Review of European, Comparative & International Environmental Law*, 27(3), 234–244. <https://doi.org/10.1111/reel.12258>
49. OECD. (2022). *Plastic pollution is growing relentlessly as waste management and recycling fall short, says OECD*. <https://www.oecd.org/environment/plastic-pollution-is-growing-relentlessly-as-waste-management-and-recycling-fall-short.htm>
50. Borrelle, S., Provencher, J., & Ngata, T. (n.d.). *How Seabirds and Indigenous Science Illustrate the Legacies of Plastics Pollution*. <https://read.aupress.ca/read/plastic-legacies/section/2bec0158-7c9d-4572-aaa3-1adacc036411>
51. Price, C. (2018). *Toxic Ecosystems: The Impact of Plastic on Marine Life*. <https://www.greenpeace.org/usa/toxic-ecosystems-the-impact-of-plastic-on-marine-life/>
52. Simon, R. (2018). *Plastic Pollution Affects Sea Life throughout the Ocean*. The Pew Charitable Trusts. <https://www.pewtrusts.org/en/research-and-analysis/articles/2018/09/24/plastic-pollution-affects-sea-life-throughout-the-ocean>
53. Sea Circular. (n.d.). *A human rights-based approach to preventing plastic pollution*. https://www.sea-circular.org/wp-content/uploads/2020/03/UNEP-COBSEA-SEA-circular_Issue-Brief-01_A-human-rights-based-approach-to-preventing-plastic-pollution.pdf
54. United Nations General Assembly Human Rights Council. *The human right to a clean, healthy and sustainable environment*. A/HRC/RES/48/13. (2021). <https://documents.un.org/doc/undoc/gen/g21/289/50/pdf/g2128950.pdf?token=x0uajoCQFLbF66L4n1&fe=true>

55. United Nations General Assembly. The human right to a clean, healthy and sustainable environment. A/RES/76/300. (2022). <https://documents.un.org/doc/undoc/gen/n22/442/77/pdf/n2244277.pdf?token=8nadNE3K11wrsWZSBC&fe=true>
56. Wiesinger, H., Wang, Z., & Hellweg, S. (2021). Deep Dive into Plastic Monomers, Additives, and Processing Aids. *Environmental Science & Technology*, 55(13), 9339–9351. <https://doi.org/10.1021/acs.est.1c00976>
57. UNEP. (n.d.). Our planet is choking on plastic. https://www.unep.org/interactives/beat-plastic-pollution/?gad_source=1&gclid=Cj0KCQiAy9msBhD0ARIsANbk0A82HDVvmLaEl6zthFpPAi6RH2v661V7bmEfEsBMIHXwMAcL93U8ZJEaAivMEALw_wcB
58. Geneva Environment Network. (2023). 2023 Theme: Solutions to Plastic Pollution. <https://www.genevaenvironmentnetwork.org/world-environment-day/world-environment-day-2023/>
59. Guinea-Bissau INC-3 Submission. (2023). https://resolutions.unep.org/resolutions/uploads/guinea_bissau_14092023_a_0.pdf
60. Cook Islands INC-3 Submission. (2023). https://resolutions.unep.org/resolutions/uploads/cook_islands_15092023_a.pdf
61. Group of Latin America and the Caribbean Countries INC-3 Opening Statement. (2023). <https://resolutions.unep.org/resolutions/uploads/grulac.pdf>
62. Group of Latin America and the Caribbean Countries INC-3 Closing Statement. (2023). https://resolutions.unep.org/resolutions/uploads/grulacclosingstatement_0.pdf
63. United Nations Environment Programme and Secretariat of the Basel, Rotterdam and Stockholm Conventions (2023). Chemicals in plastics: a technical report. Geneva. <https://www.unep.org/resources/report/chemicals-plastics-technical-report>
64. CIEL. (2019). Plastic & Health: The Hidden Costs of a Plastic Planet. <https://www.ciel.org/wp-content/uploads/2019/02/Plastic-and-Health-The-Hidden-Costs-of-a-Plastic-Planet-February-2019.pdf>
65. Regional Activity Centre for Sustainable Consumption and Production, Regional Centre under the Stockholm Convention on Persistent Organic Pollutants, & IPEN. (2020). Plastic's toxic additives and the circular economy. <http://www.cprac.org/en/news-archive/general/toxic-additives-in-plastics-hidden-hazards-linked-to-common-plastic-products>
66. Greenpeace. (2023). Forever Toxic: The science on health threats from plastic recycling. <https://www.greenpeace.org/usa/reports/forever-toxic/>
67. CIEL. (2022). Toward a New Instrument Addressing the Full Life Cycle of Plastics Overview of the Typology of International Legal Instruments. <https://www.ciel.org/wp-content/uploads/2022/01/Toward-a-New-Instrument-Addressing-the-Full-Life-Cycle-of-Plastics.pdf>
68. Earth Law Center. Rep. Utilizing Earth Law to Address Plastic Pollution, 2018. <https://static1.squarespace.com/static/55914fd1e4b01fb0b851a814/t/5ef0e36f65e27324a65bbeb3/1592845208595/Earth+Center+Law+Plastic+Pollution+Toolkit.pdf>
69. United Nations Environment Programme (2021). From Pollution to Solution: A global assessment of marine litter and plastic pollution. Nairobi. <https://www.unep.org/resources/pollution-solution-global-assessment-marine-litter-and-plastic-pollution>
70. Wang, Y., & Qian, H. (2021). Phthalates and Their Impacts on Human Health. *Healthcare*, 9(5), 603. <https://doi.org/10.3390/healthcare9050603>
71. Ellen Macarthur Foundation. (n.d.). Our vision for a circular economy for plastics. <https://www.ellenmacarthurfoundation.org/plastics-vision#:~:text=All%20plastic%20packaging%20is%20reused,all%20people%20involved%20are%20respected>
72. Greenpeace. (2023). Forever Toxic: The science on health threats from plastic recycling. <https://www.greenpeace.org/usa/reports/forever-toxic>
73. UNESCO. (n.d.). Right to Information. <https://www.unesco.org/en/right-information>
74. Seewoo, B. J., Goodes, L. M., Mofflin, L., Mulders, Y. R., Wong, E. V., Toshniwal, P., Brunner, M., Alex, J., Johnston, B., Elagali, A., Gozt, A., Lyle, G., Choudhury, O., Solomons, T., Symeonides, C., & Dunlop, S. A. (2023). The plastic health map: A systematic evidence map of human health studies on plastic-associated chemicals. *Environment International*, 181, 108225. <https://doi.org/10.1016/j.envint.2023.108225>
75. Sharma, P., Bhagat, P., Mandal, M., & Singh, T. (2021). Assessment of awareness regarding health hazards of plastic chemicals and their warning label among a sample population of Varanasi City: A cross-sectional study. *Journal of Pharmacy And Bioallied Sciences*, 13(6), 1428. https://doi.org/10.4103/jpbs.jpbs_240_21
76. Miguel, I., Santos, A., Venâncio, C., & Oliveira, M. (2024). Knowledge, concerns and attitudes towards plastic pollution: An empirical study of public perceptions in Portugal. *Science of The Total Environment*, 906, 167784. <https://doi.org/10.1016/j.scitotenv.2023.167784>
77. People of the State of New York v. Pepsico, Inc., 814682 (2023) https://ag.ny.gov/sites/default/files/court-filings/pepsico-complaint_0.pdf
78. Alberghini, L., Truant, A., Santonicola, S., Colavita, G., & Giaccone, V. (2022). Microplastics in Fish and Fishery Products and Risks for Human Health: A Review. *International Journal of Environmental Research and Public Health*, 20(1), 789. <https://doi.org/10.3390/ijerph20010789>
79. O'Brien, S., Rauert, C., Ribeiro, F., Okoffo, E. D., Burrows, S. D., O'Brien, J. W., Wang, X., Wright, S. L., & Thomas, K. V. (2023). There's something in the air: A review of sources, prevalence and behaviour of microplastics in the atmosphere. *Science of The Total Environment*, 874, 162193. <https://doi.org/10.1016/j.scitotenv.2023.162193>
80. Vandenberg, J., & Ota, Y. (2022). Towards an Equitable Approach to Marine Plastic Pollution. *Ocean Nexus Equity & Marine Plastic Pollution Report 2022*. <https://plastics.uri.edu/wp/wp-content/uploads/Towards-an-Equitable-Approach-to-Marine-Plastic-Pollution-2022.pdf>

81. Karasik, R., Lauer, N. E., Baker, A.-E., Lisi, N. E., Somarelli, J. A., Eward, W. C., Fürst, K., & Dunphy-Daly, M. M. (2023). Inequitable distribution of plastic benefits and burdens on economies and public health. *Frontiers in Marine Science*, 9, 1017247. <https://doi.org/10.3389/fmars.2022.1017247>
82. Liboiron, M., Liu, R., Earles, E., & Walker-Franklin, I. (2023). Models of justice evoked in published scientific studies of plastic pollution. *FACETS*, 8, 1–34. <https://doi.org/10.1139/facets-2022-0108>
83. Kunming-Montreal Global Biodiversity Framework 2022. CBD/COP/DEC/15/4. <https://www.cbd.int/doc/decisions/cop-15/cop-15-dec-04-en.pdf>
84. NZ Māori NZ Maori Tourism Society. (2023). *Kaimoana*. <https://maoritourism.co.nz/what-say/kaimoana>
85. Peryman, M. (2022). *Global Plastics Treaty: An Indigenous perspective on the plastic pollution crisis*. <https://www.greenpeace.org/aotearoa/story/global-plastics-treaty-an-indigenous-perspective-on-the-plastic-pollution-crisis/>
86. United Nations (General Assembly). (2007). Declaration on the Rights of Indigenous People. A/RES/61/295 https://www.un.org/en/genocideprevention/documents/atrocities-crimes/Doc.18_declaration%20rights%20indigenous%20peoples.pdf
87. Indigenous Peoples Representatives Statement at INC-2 on Agenda Item 4 (2023). <https://apps1.unep.org/resolutions/uploads/indigenouspeoples.pdf>
88. Indigenous Peoples Major Group Statement to INC-2. https://resolutions.unep.org/resolutions/uploads/indigenous_peoples_major_group_ipmg_15082023_b_0.pdf
89. Indigenous Peoples Major Group Statement at INC-2 on Agenda Item 7 (2023). https://resolutions.unep.org/resolutions/uploads/indigenous_peoples_major_group_statement-agenda_item_7_0.pdf
90. The New School. (2019). 4.4 Million People in the U.S. are Exposed to Pollution from Waste Incinerators. <https://www.newschool.edu/pressroom/pressreleases/2019/incinerators.htm?preview=true%20Pollution%20and%20health%20impacts%20of%20waste-to-energy%20incineration>
91. GAIA (2019). Pollution and Health Impacts of Waste-to-Energy Incineration. https://www.no-burn.org/wp-content/uploads/Pollution-Health_final-Nov-14-2019.pdf
92. Sierra Club, 'Plastic's Influence on Environmental Racism.' (2020) <<https://www.sierraclub.org/texas/houston/blog/2020/07/plastic-s-influence-environmental-racism>>.
93. Eco-Cycle, 'Pollution & Public Health' (2022) <<https://ecocycle.org/learn-about-zero-waste/pollution-and-public-health/>>.
94. Riley, W. J. (2012). Health disparities: Gaps in access, quality and affordability of medical care. *Transactions of the American Clinical and Climatological Association*, 123, 167–172; discussion 172-174. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3540621>
95. Women in Informal Employment: Globalizing and Organizing. (n.d.). Waste Pickers. <https://www.wiego.org/waste-pickers>
96. Diana, Z., Karasik, R., Merrill, G. B., Morrison, M., Corcoran, K. A., Vermeer, D., Hepler-Smith, E., Jayasundara, N., Pare, J., Virdin, J., Eward, W. C., Somarelli, J. A., Dunphy-Daly, M. M., & Rittschof, D. (2022). A transdisciplinary approach to reducing global plastic pollution. *Frontiers in Marine Science*, 9, 1032381. <https://doi.org/10.3389/fmars.2022.1032381>
97. Chen, S. (2023). 'A global treaty to end plastic pollution is in sight.' UNDP. <https://www.undp.org/blog/global-treaty-end-plastic-pollution-sight>
98. Plastic Soup Foundation, (2021). 'Who is responsible for plastic pollution?' <https://www.plasticsoupfoundation.org/en/plastic-problem/plastic-soup/who-is-responsible/>
99. OECD. (2015). Small island developing states (SIDS) and the post-2015 development finance agenda https://www.oecd.org/dac/financing-sustainable-development/Addis_Flyer_SIDS_FINAL.pdf
100. International Union for Conservation of Nature (2023). 'Small Island Developing States call for ambitious Global Plastics Treaty – INC-2 Paris.' <https://www.iucn.org/story/202306/small-island-developing-states-call-ambitious-global-plastics-treaty-inc-2-paris>
101. Shipton, L., & Dauvergne, P. (2021). Health concerns of plastics: Energizing the global diffusion of anti-plastic norms. *Journal of Environmental Planning and Management*, 65(11), 2124–2144. <https://doi.org/10.1080/09640568.2021.1957796>
102. Jones, M. W., Peters, G. P., Gasser, T., Andrew, R. M., Schwingshackl, C., Gütschow, J., Houghton, R. A., Friedlingstein, P., Pongratz, J., & Le Quére, C. (2023). National contributions to climate change due to historical emissions of carbon dioxide, methane, and nitrous oxide since 1850. *Scientific Data*, 10(1), 155. <https://doi.org/10.1038/s41597-023-02041-1>
103. Ritchie, H. (2023, October 5). How much of global greenhouse gas emissions come from plastics? <https://ourworldindata.org/ghg-emissions-plastics#:~:text=We%20can%20see%20the%20breakdown,around%203.3%25%20of%20global%20emissions.>
104. Alliance of Small Island States (AOSIS) Submission at INC-3 (2023). https://resolutions.unep.org/resolutions/uploads/aosis_16112023_part_iii_and_iv.pdf
105. UN Office for Disaster Risk Reduction (UNDRR) (2023) Statement by the United Nations Office for Disaster Risk Reduction at INC-3 Plenary Meeting, Agenda Item 4 (2023).
106. Kaza, S., Yao, L. C., Bhada-Tata, P., & Van Woerden, F. (2018). What a Waste 2.0: A Global Snapshot of Solid Waste Management to 2050. <https://doi.org/10.1596/978-1-4648-1329-0>
107. Bidashimwa, D., Hoke, T., Huynh, T. B., Narkpitaks, N., Priyongroho, K., Ha, T. T., Burns, A., & Weissman, A. (2023). Plastic pollution: How can the global health community fight the growing problem? *BMJ Global Health*, 8(Suppl 3). <https://doi.org/10.1136/bmjgh-2023-012140>

108. Steenmans, K., & Malcolm, R. (2023). Using plastic wastes to exemplify justice dimensions of extended producer responsibility. *Advances in Environmental and Engineering Research*, 04(01), 1–10. <https://doi.org/10.21926/aer.2301024>
109. Brooks, A. L., Wang, S., & Jambeck, J. R. (2018). The Chinese import ban and its impact on Global Plastic Waste Trade. *Science Advances*, 4(6). <https://doi.org/10.1126/sciadv.aat0131>
110. Strobel, R., Hagedorn, T., & Lopes, A. D. C. P. (2023). Potential environmental impacts of a plastic waste export ban in Germany. *Frontiers in Manufacturing Technology*, 3, 1077313. <https://doi.org/10.3389/fmtec.2023.1077313>
111. Greenpeace International. (2021, May 17). *Investigation finds plastic from the UK and Germany illegally dumped in Turkey*. <https://www.greenpeace.org/international/press-release/47759/investigation-finds-plastic-from-the-uk-and-germany-illegally-dumped-in-turkey/>
112. Basel Action Network. (2022). *Germany Export Data*. <https://www.ban.org/plastic-waste-project-hub/trade-data/germany-export-data-annual-summary>
113. Root, R. L. (2023). 'UN plastics treaty raises concerns for low-income countries.' <https://www.devex.com/news/un-plastics-treaty-raises-concerns-for-low-income-countries-106564>
114. Asimakopoulou, A. G., Elangovan, M., & Kannan, K. (2016). Migration of Parabens, Bisphenols, Benzophenone-type UV Filters, Triclosan, and Triclocarban from Teethers and its Implications for Infant Exposure. *Environmental Science & Technology*, 50(24), 13539–13547. <https://doi.org/10.1021/acs.est.6b04128>
115. Jeon, G. W. (2022). Bisphenol A Leaching from Polycarbonate Baby Bottles into Baby Food causes Potential Health Issues. *Clinical and Experimental Pediatrics*, 65(9), 450–452. <https://doi.org/10.3345/cep.2022.00661>
116. O'Meara, N. (2023). Human rights and the global plastics treaty to protect health, ocean ecosystems and our climate. *The International Journal of Marine and Coastal Law*, 38(3), 480–515. <https://doi.org/10.1163/15718085-bja10143>
117. UN Special Rapporteur on hazardous substances. (2016). 'Toxic substance exposure a "silent epidemic" facing children.' United Nations Human Rights Office of the High Commissioner. <https://www.ohchr.org/en/stories/2016/09/toxic-substance-exposure-silent-epidemic-facing-children>
118. K Vohra, A Vodonos, J Schwartz *et al.*, 'Global mortality from outdoor fine particle pollution generated by fossil fuel combustion: Results from GEOS-Chem' (2021) *Environmental Research* 110754, <https://doi.org/10.1016/j.envres.2021.110754>
119. Zhang, Y., Han, A., Deng, S., Wang, X., Zhang, H., Hajat, S., Ji, J. S., Liang, W., & Huang, C. (2023). The Impact of Fossil Fuel Combustion on Children's Health and the Associated losses of Human Capital. *Global Transitions*, 5, 117–124. <https://doi.org/10.1016/j.gt.2023.07.001>
120. Vos, T., Lim, S. S., Abbafati, C., Abbas, K. M., Abbasi, M., Abbasifard, M., Abbasi-Kangevari, M., Abbastabar, H., Abd-Allah, F., Abdelalim, A., Abdollahi, M., Abdollahpour, I., Abolhassani, H., Aboyans, V., Abrams, E. M., Abreu, L. G., Abrigo, M. R. M., Abu-Raddad, L. J., Abushouk, A. I., ... Murray, C. J. L. (2020). Global burden of 369 diseases and injuries in 204 countries and territories, 1990–2019: A systematic analysis for the Global Burden of Disease Study 2019. *The Lancet*, 396(10258), 1204–1222. [https://doi.org/10.1016/S0140-6736\(20\)30925-9](https://doi.org/10.1016/S0140-6736(20)30925-9)
121. L Persson, B Carney Almroth, CD Collins *et al.*, 'Outside the safe operating space of the planetary boundary for novel entities' (2022) 56(3) *Environmental Science & Technology*. [10.1021/acs.est.1c04158](https://doi.org/10.1021/acs.est.1c04158)
122. Clayton, S., Kals, E., & Feygina, I. (2016). Justice and Environmental Sustainability. In C. Sabbagh & M. Schmitt (Eds.), *Handbook of Social Justice Theory and Research*. Springer New York. <https://doi.org/10.1007/978-1-4939-3216-0>
123. Gallo, F., Fossi, C., Weber, R., Santillo, D., Sousa, J., Ingram, I., Nadal, A., & Romano, D. (2018). Marine litter plastics and microplastics and their toxic chemicals components: The need for urgent preventive measures. *Environmental Sciences Europe*, 30(1), 13. <https://doi.org/10.1186/s12302-018-0139-z>
124. Hausmann, J., By, Rodenberg, B., Saputro, T. S., & Daniel Abunales and Lea Goelnitz. (2022). Overexposed. Heinrich Böll Stiftung. <https://www.boell.de/en/2022/03/11/overexposed#:~:text=Tampons%20may%20comprise%20up%20to,applicators%20also%20often%20contain%20phthalates.>
125. Muschack, S. (2013). Gehen von Phthalaten gesundheitliche Risiken Aus?. Umweltbundesamt. <https://www.umweltbundesamt.de/service/uba-fragen/gehen-von-phthalaten-gesundheitliche-risiken-aus>
126. Marquès M., Domingo J. L., Nadal M., Schuhmacher M. (2020). Health risks for the population living near petrochemical industrial complexes. 2. adverse health outcomes other than cancer. *Sci. total Environ.* 730, 139122. doi: 10.1016/j.scitotenv.2020.139122
127. Huang C. C., Pan S. C., Chin W. S., Chen Y. C., Hsu C. Y., Lin P., *et al.* (2022). Living proximity to petrochemical industries and the risk of attention-deficit/hyperactivity disorder in children. *Environ. Res.* 212, 113128. doi: 10.1016/j.envres.2022.113128
128. Gottlieb M. S., Shear C. L., Seale D. B. (1982). Lung cancer mortality and residential proximity to industry. *Environ. Health Perspect.* 45, 157–164. doi: 10.1289/ehp.8245157
129. Domingo J. L., Marquès M., Nadal M., Schuhmacher M. (2020). Health risks for the population living near petrochemical industrial complexes. 1. cancer risks: a review of the scientific literature. *Environ. Res.* 186, 109495. doi: 10.1016/j.envres.2020.109495
130. *Disability: Higher risk of poverty or social exclusion*. Disability: higher risk of poverty or social exclusion - Products Eurostat News - Eurostat. (2022, December 14). <https://ec.europa.eu/eurostat/web/products-eurostat-news/w/ddn-20221214-2>
131. Bullard, R. D. (2018). *Dumping in Dixie: Race, Class, and Environmental Quality*, 3. <https://doi.org/10.4324/9780429495274>
132. GAIA. (2022). Cradle to Grave: The health harms of fossil fuel dependence and the case for a just phase-out <https://climateandhealthalliance.org/wp-content/uploads/2022/07/Cradle-To-Grave-Fossil-Fuels-Brief.pdf>
133. CIEL. 'Plastic and Human Health: A Lifecycle Approach to Plastic Pollution.' (2019). <https://www.ciel.org/wp-content/uploads/2019/02/Plastic-and-Health-The-Hidden-Costs-of-a-Plastic-Planet-February-2019.pdf>
134. Helal, S. F., & Elshafy, W. S. (2013). Health hazards among workers in plastic industry. *Toxicology and Industrial Health*, 29(9), 812–819. <https://doi.org/10.1177/0748233712442728>

135. Dematteo R, Keith MM, Brophy JT, et al. Chemical Exposures of Women Workers in the Plastics Industry with Particular Reference to Breast Cancer and Reproductive Hazards. *NEW SOLUTIONS: A Journal of Environmental and Occupational Health Policy*. 2013;22(4):427-448. doi:10.2190/NS.22.4.d
136. Onyije, F. M., Hosseini, B., Togawa, K., Schüz, J., & Olsson, A. (2021). Cancer Incidence and Mortality among Petroleum Industry Workers and Residents Living in Oil Producing Communities: A Systematic Review and Meta-Analysis. *International Journal of Environmental Research and Public Health*, 18(8), 4343. <https://doi.org/10.3390/ijerph18084343>
137. Rustagi, N., Pradhan, S., & Singh, R. (2011). Public health impact of plastics: An overview. *Indian Journal of Occupational and Environmental Medicine*, 15(3), 100. <https://doi.org/10.4103/0019-5278.93198>;
138. Human Rights Watch. (2022). 'It's As If They're Poisoning Us.' <https://www.hrw.org/report/2022/09/21/its-if-theyre-poisoning-us/health-impacts-plastic-recycling-turkey>
139. United Nations Environment Programme. 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. (2023). UNEP/PP/INC.2/4. <https://wedocs.unep.org/xmlui/bitstream/handle/20.500.11822/42190/UNEP-PP-INC.2-4%20English.pdf?sequence=13&isAllowed=y>
140. International Alliance of Waste-Pickers Submission for INC-2. (2023). https://apps1.unep.org/resolutions/uploads/230113_international_alliance_of_waste-pickers.pdf
141. Paris Agreement to the United Nations Framework Convention on Climate Change, Dec. 12, 2015 FCCC/CP/2015/10/Add.1.
142. United Nations Framework Convention on Climate Change FCCC/INFORMAL/84 GE.05-62220 (E) 200705. <https://unfccc.int/resource/docs/convkp/conveng.pdf>
143. Report of the United Nations Conference on Environment and Development, Rio de Janeiro, Jun. 3-14, 1992, A/Conf.151/26/Rev.1 (Vol.1). https://www.un.org/en/development/desa/population/migration/generalassembly/docs/globalcompact/A_CONF.151_26_Vol.1_Declaration.pdf
144. Kyoto Protocol to the United Nations Framework Convention on Climate Change, Dec. 10, 1997, 2303 U.N.T.S. 162. <https://unfccc.int/resource/docs/convkp/kpeng.pdf>
145. United Nations. 2015. 'Transforming our world: the 2030 Agenda for Sustainable Development.' <https://wedocs.unep.org/20.500.11822/9814>
146. 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 2023. <https://www.un.org/bbnj/>
147. Hofbauer, J. (2022). Free, Prior and Informed Consent (FPIC). *SSRN Electronic Journal*. <https://doi.org/10.2139/ssrn.4084700>
148. Kichwa Indigenous People of Sarayaku v Ecuador, Judgment, Inter- American Court of Human Rights Series C No 245 (27 June 2012)
149. Republic of Fiji Statement to INC-3. (2020). <https://resolutions.unep.org/resolutions/uploads/fiji.pdf>
150. Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services, I. (2022). Methodological assessment of the diverse values and valuation of nature of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services. Zenodo. <https://doi.org/10.5281/ZENODO.652252>.
151. Eco Jurisprudence Monitor. (2024). <https://ecojurisprudence.org>
152. Putzer, A., Lambooy, T., Jeurissen, R., & Kim, E. (2022). Putting the rights of nature on the map. A quantitative analysis of rights of nature initiatives across the world. *Journal of Maps*, 18(1), 89–96. <https://doi.org/10.1080/17445647.2022.2079432>
153. United Nations. Harmony With Nature [Internet]. Available from: <http://www.harmonywithnatureun.org/>
154. Kauffman, C. M., & Martin, P. L. (2018). Constructing Rights of Nature Norms in the US, Ecuador, and New Zealand. *Global Environmental Politics*, 18(4), 43–62. https://doi.org/10.1162/glep_a_00481
155. United Nations. The Future We Want. (2012). Outcome document of the United Nations Conference on Sustainable Development. <https://sustainabledevelopment.un.org/content/documents/733FutureWeWant.pdf>
156. Pinto-Bazurco, J. (2022). 'How to Enforce the Polluter-Pays Principle.' *International Institute for Sustainable Development*. <https://www.iisd.org/articles/polluter-pays-principle>.
157. OECD. (2020). Recommendation of the Council on Guiding Principles concerning International Economic Aspects of Environmental Policies
158. Special report 12/2021: The Polluter Pays Principle, 2021. https://www.eca.europa.eu/lists/ecadocuments/sr21_12/sr_polluter_pays_principle_en.pdf.
159. Escobar-Pemberthy, N., & Ivanova, M. (2020). Implementation of multilateral environmental agreements: Rationale and design of the Environmental Conventions Index. *Sustainability*, 12(17), 7098. <https://doi.org/10.3390/su12177098>
160. Nafziger, J. A. R. (2011). Basic Functions and Principles of International Environmental Law in the Context of Managing Water Resources . *Denver Journal of International Law & Policy*, 39(3), 381–395. <https://digitalcommons.du.edu/cgi/viewcontent.cgi?article=1177&context=djilp>
161. IPEN Quick Views: Third Session on the Intergovernmental Negotiating Committee (INC-3) to Develop an International Legally Binding Instrument on Plastic Pollution. IPEN. (2023, November). https://ipen.org/sites/default/files/documents/plastic_inc3_quick_views_web.pdf
162. White R, 'Life at the Fenceline: Understanding Cumulative Health Hazards in Environmental Justice Communities' (Environmental Justice Health Alliance for Chemical Policy Reform 2018) <https://ej4all.org/assets/media/documents/Life%20at%20the%20Fenceline%20-%20English%20-%20Public.pdf>

163. OECD. (n.d.). Plastic leakage and greenhouse gas emissions are increasing. <https://www.oecd.org/environment/plastics/increased-plastic-leakage-and-greenhouse-gas-emissions.htm>
164. Center for International Environmental Law. *Reducing Plastic Production to Achieve Climate Goals: Key Considerations for the Plastics Treaty Negotiations*. (2023, November 15). <https://www.ciel.org/reports/reducing-plastic-production-to-achieve-climate-goals-key-considerations-for-the-plastics-treaty-negotiations/>
165. Raubenheimer, K., & Urho, N. (2023). *Science-Policy Interface for Plastic Pollution*. Grid Arendal. https://gridarendal-website-live.s3.amazonaws.com/production/documents/:s_document/1057/original/SPI-report_fixed.pdf?1699351194
166. Gurgacz, N. S., Kvale, K., Eby, M., & Weaver, A. J. (2023). Impact of plastic pollution on atmospheric carbon dioxide. *FACETS*, 8, 1–7. <https://doi.org/10.1139/facets-2023-0061>
167. Beyond Plastics. (2021). *The New Coal: Plastics & Climate Change*. https://static1.squarespace.com/static/5eda91260bbb7e7a4bf528d8/t/616ef29221985319611a64e0/1634661022294/R_EPORT_The_New-Coal_Plastics_and_Climate-Change_10-21-2021.pdf
168. Pacific Environment. (n.d.). *Stemming the Plastic-Climate Crisis*. <https://www.pacificenvironment.org/wp-content/uploads/2023/05/Stemming-the-Plastic-Climate-Crisis-1.pdf>
169. CIEL. *Reducing Plastic to Achieve Climate Goals: Key Considerations for the Plastic Treaty Negotiations*. (2023). https://www.ciel.org/wp-content/uploads/2023/09/Reducing-Plastic-Production-to-Achieve-Climate-Goals_Sept21_V5.pdf
170. Cowan, E., & Tiller, R. (2021). What Shall We Do With a Sea of Plastics? A Systematic Literature Review on How to Pave the Road Toward a Global Comprehensive Plastic Governance Agreement. *Frontiers in Marine Science*, 8, 798534. <https://doi.org/10.3389/fmars.2021.798534>
171. Lebreton, L., Slat, B., Ferrari, F., Sainte-Rose, B., Aitken, J., Marthouse, R., Hajbane, S., Cunsolo, S., Schwarz, A., Levivier, A., Noble, K., Debeljak, P., Maral, H., Schoeneich-Argent, R., Brambini, R., & Reisser, J. (2018). Evidence that the Great Pacific Garbage Patch is rapidly accumulating plastic. *Scientific Reports*, 8(1), 4666. <https://doi.org/10.1038/s41598-018-22939-w>
172. The Ocean Cleanup. (n.d.). What is the Great Pacific Garbage Patch? Lebreton, L., Slat, B., Ferrari, F., Sainte-Rose, B., Aitken, J., Marthouse, R., Hajbane, S., Cunsolo, S., Schwarz, A., Levivier, A., Noble, K., Debeljak, P., Maral, H., Schoeneich-Argent, R., Brambini, R., & Reisser, J. (2018). Evidence that the Great Pacific Garbage Patch is rapidly accumulating plastic. *Scientific Reports*, 8(1), 4666. <https://doi.org/10.1038/s41598-018-22939-w>
173. Goßmann, I., Herzke, D., Held, A., Schulz, J., Nikiforov, V., Georgi, C., Evangelidou, N., Eckhardt, S., Gerdt, G., Wurl, O., & Scholz-Böttcher, B. M. (2023). Occurrence and backtracking of microplastic mass loads including tire wear particles in northern Atlantic air. *Nature Communications*, 14(1), 3707. <https://doi.org/10.1038/s41467-023-39340-5>
174. NOAA. (n.d.). What are microplastics? <https://oceanservice.noaa.gov/facts/microplastics.html>
175. Petcore-europe.org. (n.d.). How does PET plastic recycling work? <https://www.recycletheone.com/recycle-now/how-does-pet-plastic-recycling-work/>
176. The Great Nurdle Hunt. (n.d.). What Are Nurdles? <https://www.nurdlehunt.org.uk/the-problem.html>
177. Andrade, H., Glüge, J., Herzke, D., Ashta, N. M., Nayagar, S. M., & Scheringer, M. (2021). Oceanic long-range transport of organic additives present in plastic products: An overview. *Environmental Sciences Europe*, 33(1), 85. <https://doi.org/10.1186/s12302-021-00522-x>
178. Bender, M. (2018). An Earth Law Solution to Ocean Plastic Pollution. Earth Law Center. <https://www.earthlawcenter.org/blog-entries/2018/3/an-earth-law-solution-to-ocean-plastic-pollution>
179. Ronkay, F., Molnar, B., Gere, D., & Czigan, T. (2021). Plastic waste from marine environment: Demonstration of possible routes for recycling by different manufacturing technologies. *Waste Management*, 119, 101–110. <https://doi.org/10.1016/j.wasman.2020.09.029>
180. United Nations Development Programme. (2022, November 15). What do plastics have to do with climate change? <https://stories.undp.org/what-do-plastics-have-to-do-with-climate-change>
181. Greenpeace. (2022). Circular Claims Fall Flat Again: 2022 Update. OECD. (2022). Plastic pollution is growing relentlessly as waste management and recycling fall short, says OECD. <https://www.oecd.org/environment/plastic-pollution-is-growing-relentlessly-as-waste-management-and-recycling-fall-short.htm>
182. GAIA. (2020). 'False Solutions to the Plastic Pollution Crisis.' https://www.no-burn.org/wp-content/uploads/False-solutions_Nov-9-2020.pdf
183. United Nations. (2022). Nations agree to end plastic pollution. <https://www.un.org/en/climatechange/nations-agree-end-plastic-pollution>
184. New Zealand INC-3 text proposal on Part II.8 (2023). https://resolutions.unep.org/resolutions/uploads/new_zealand_16112023_part_ii.8_emissions_and_releases_of_plastic_paragraph_1.pdf
185. PSIDS INC-3 text proposal on Part II.8 (2023). https://resolutions.unep.org/resolutions/uploads/psids_emissions.pdf
186. United Kingdom INC-3 text proposal on Part II.8 (2023). https://resolutions.unep.org/resolutions/uploads/united_kingdom_16112023_8_and_9b.pdf
187. Mauritius INC-3 text proposal on Part II.8 (2023). https://resolutions.unep.org/resolutions/uploads/mauritius_-_emissions_and_waste_mangement_intervention.pdf
188. Republic of Philippines INC-3 text proposal on Part II.8 (2023). https://resolutions.unep.org/resolutions/uploads/phl_part2_6_9.pdf
189. Brazil text proposal on Part II.8 at INC (2023). https://resolutions.unep.org/resolutions/uploads/brazil_15112023_emissions.pdf
190. IUCN. Issues Brief, Marine Plastic Pollution. (2021). <https://www.iucn.org/resources/issues-brief/marine-plastic-pollution>

191. Azevedo-Santos, V. M., Brito, M. F. G., Manoel, P. S., Perroca, J. F., Rodrigues-Filho, J. L., Paschoal, L. R. P., Gonçalves, G. R. L., Wolf, M. R., Blettler, M. C. M., Andrade, M. C., Nobile, A. B., Lima, F. P., Ruocco, A. M. C., Silva, C. V., Perbiche-Neves, G., Portinho, J. L., Giarrizzo, T., Arcifa, M. S., & Pelicice, F. M. (2021). Plastic pollution: A focus on freshwater biodiversity. *Ambio*, 50(7), 1313–1324. <https://doi.org/10.1007/s13280-020-01496-5>
192. Rubesinghe, C., Brosché, S., Withanage, H., Pathragoda, D., Karlsson, T. X-Press Pearl, a ‘new kind of oil spill’ consisting of a toxic mix of plastics and invisible chemicals. International Pollutants Elimination Network (IPEN). https://ipen.org/sites/default/files/documents/ipen-sri-lanka-ship-fire-v1_2aw-en.pdf
193. Gilman, E., Musyl, M., Suuronen, P., Chaloupka, M., Gorgin, S., Wilson, J., & Kuczenski, B. (2021). Highest risk abandoned, lost and discarded fishing gear. *Scientific Reports*, 11(1), 7195. <https://doi.org/10.1038/s41598-021-86123-3>
194. Toxic Tours. (n.d.). Ingeniero White, Buenos Aires Province, Argentina. <https://toxictours.org/argentina-ingeniero-white/#chapter2>
195. Omnexus. (n.d.). Comprehensive Guide on Polyvinyl Chloride (PVC). <https://omnexus.specialchem.com/selection-guide/polyvinyl-chloride-pvc-plastic#:~:text=Polyvinyl%20Chloride%20>
196. Polyurethanes.org. (n.d.). What is polyurethane? <https://www.polyurethanes.org/what-is-it/#:~:text=Polyurethane%20is%20a%20plastic%20material,cushioning%20for%20furniture>
197. Centers for Disease Control and Prevention. (n.d.). *Phenol*. The National Institute for Occupational Safety and Health. <https://www.cdc.gov/niosh/topics/phenol/default.html>
198. Viego, V. (2023). Environmental Degradation and Collective Action in Ingeniero White, Argentina. *Journal of Developing Societies*, 39(2), 174–195. <https://doi.org/10.1177/0169796X231160320>
199. Truchet, D. M., Noceti, B. M., Villagran, D. M., & Truchet, R. M. (2022). Alternative Conservation Paradigms and Ecological Knowledge of Small-Scale Artisanal Fishers in a Changing Marine Scenario in Argentina. *Human Ecology*, 50(2), 209–225. <https://doi.org/10.1007/s10745-022-00309-5>
200. Carignano, C., Elosegui, L., Abrego, P., Spagnolo, S., Esandi, M. E., Frapicchini, R., Reising, O., & Monteros, C. (2009). Estudio comparativo de la morbilidad por asma entre la población de distintas zonas de Bahía Blanca y la de toda la ciudad. *Archivos de Alergia e Inmunología Clínica*, 40(1), 19–24. https://adm.meducatium.com.ar/contenido/articulos/8900190024_602/pdf/8900190024.pdf
201. Bianco, C., Isso, F., Moskat, M., & Ecologista, T. (2021). *Plásticos en América Latina: Breve reseña de su producción, consumo e impactos ambientales*. Break Free from Plastic and GAIA. <https://www.no-burn.org/wp-content/uploads/2022/03/Plasticos-en-America-Latina-2022.pdf>
202. Giovis, M. (2019). The Bahía Blanca Petrochemical Complex: Why I Have Made a Documentary Called “Ingeniero White: A Town They Are Killing.” <https://toxicnews.org/2019/11/18/the-bahia-blanca-petrochemical-complex-why-i-have-made-a-documentary-called-ingeniero-white-a-town-they-are-killing/>
203. Bianco, C., Isso, F., Moskat, M., & Ecologista, T. (2021). *Plásticos en América Latina: Breve reseña de su producción, consumo e impactos ambientales*. Break Free from Plastic and GAIA. <https://www.no-burn.org/wp-content/uploads/2022/03/Plasticos-en-America-Latina-2022.pdf>
204. Eriksen, M., Cowger, W., Erdle, L. M., Coffin, S., Villarrubia-Gómez, P., Moore, C. J., Carpenter, E. J., Day, R. H., Thiel, M., & Wilcox, C. (2023). A growing plastic smog, now estimated to be over 170 trillion plastic particles afloat in the world’s oceans—Urgent solutions required. *PLOS ONE*, 18(3), e0281596. <https://doi.org/10.1371/journal.pone.0281596>
205. Ragusa, A., Svelato, A., Santacrose, C., Catalano, P., Notarstefano, V., Carnevali, O., Papa, F., Rongioletti, M. C. A., Baiocco, F., Draghi, S., D’Amore, E., Rinaldo, D., Matta, M., & Giorgini, E. (2021). Plasticenta: First evidence of microplastics in human placenta. *Environment International*, 146, 106274. <https://doi.org/10.1016/j.envint.2020.106274>
206. Mahendran, R., & Ramaswamy, S. N. (2024). Nanoplastics as Trojan Horses: Deciphering Complex Connections and Environmental Ramifications: A Review. *Chemistry Africa*. <https://doi.org/10.1007/s42250-023-00865-3>
207. Fournier, S. B., D’Errico, J. N., Adler, D. S., Kollontzi, S., Goedken, M. J., Fabris, L., Yurkow, E. J., & Stapleton, P. A. (2020). Nanopolystyrene translocation and fetal deposition after acute lung exposure during late-stage pregnancy. *Particle and Fibre Toxicology*, 17(1), 55. <https://doi.org/10.1186/s12989-020-00385-5>
208. Arkin, C. ‘Governments Weigh New Global Treaty on Plastics and Sustainable Development: SDG Knowledge Hub: IISD.’ (2022. SDG Knowledge Hub). <https://sdg.iisd.org/commentary/guest-articles/governments-weigh-new-global-treaty-on-plastics-and-sustainable-development/>
209. Kirk, E. A., & Popattanachai, N. (2018). Marine plastics: Fragmentation, effectiveness and legitimacy in international lawmaking. *Review of European, Comparative & International Environmental Law*, 27(3), 222–233. <https://doi.org/10.1111/reel.12261>
210. Ferraro, G., & Failler, P. (2020). Governing plastic pollution in the oceans: Institutional challenges and areas for action. *Environmental Science & Policy*, 112, 453–460. <https://doi.org/10.1016/j.envsci.2020.06.015>
211. Wright, S. L., & Kelly, F. J. (2017). Plastic and Human Health: A Micro Issue? *Environmental Science & Technology*, 51(F2), 6634–6647. <https://doi.org/10.1021/acs.est.7b00423>
212. Ambrose, K. K., & Walker, T. R. (2023). Identifying opportunities for harmonized microplastics and mesoplastics monitoring for Caribbean Small Island Developing States using a spatiotemporal assessment of beaches in South Eleuthera, The Bahamas. *Marine Pollution Bulletin*, 193, 115140. <https://doi.org/10.1016/j.marpolbul.2023.115140>
213. Yee, M. S.-L., Hij, L.-W., Looi, C. K., Lim, W.-M., Wong, S.-F., Kok, Y.-Y., Tan, B.-K., Wong, C.-Y., & Leong, C.-O. (2021). Impact of Microplastics and Nanoplastics on Human Health. *Nanomaterials*, 11(2), 496. <https://doi.org/10.3390/nano11020496>
214. Diez, S.M., Patil, P.G., Morton, J., Rodriguez, D.J., Vanzella, A., Robin, D.V., Maes, T., Corbin, C. (2019). Marine Pollution in the Caribbean: Not a Minute to Waste. Washington, D.C.: World Bank Group. <https://documents1.worldbank.org/curated/en/482391554225185720/pdf/Marine-Pollution-in-the-Caribbean-Not-a-Minute-to-Waste.pdf>
215. Anderson, J. C., Park, B. J., & Palace, V. P. (2016). Microplastics in aquatic environments: Implications for Canadian ecosystems. *Environmental Pollution*, 218, 269–280. <https://doi.org/10.1016/j.envpol.2016.06.074>

216. Pitt, J. A., Trevisan, R., Massarsky, A., Kozal, J. S., Levin, E. D., & Di Giulio, R. T. (2018). Maternal transfer of nanoplastics to offspring in zebrafish (*Danio rerio*): A case study with nanopolystyrene. *Science of The Total Environment*, 643, 324–334. <https://doi.org/10.1016/j.scitotenv.2018.06.186>
217. Justino, A. K. S., Ferreira, G. V. B., Fauvelle, V., Schmidt, N., Lenoble, V., Pelage, L., Martins, K., Travassos, P., & Lucena-Frédou, F. (2023). From prey to predators: Evidence of microplastic trophic transfer in tuna and large pelagic species in the southwestern Tropical Atlantic. *Environmental Pollution*, 327, 121532. <https://doi.org/10.1016/j.envpol.2023.121532>
218. The Nordic Council of Ministers. (n.d.). *Addressing Microplastics under a Global Agreement on Plastic Pollution*. <https://pub.norden.org/temanord2022-566/#120316>
219. Norwegian Institute for Water Research. Submission to INC-2. (2023). https://apps1.unep.org/resolutions/uploads/230113_norwegian_institute_for_water_research_niva.pdf
220. Thailand Statement to INC-3 (2023). https://resolutions.unep.org/resolutions/uploads/thailand_18092023_a.pdf
221. Panama Statement to Contact Group 1 INC-3 (2023). https://resolutions.unep.org/resolutions/uploads/panama_part1and2.pdf
222. Monaco Statement to Contact Group 1 (INC-3) (2023). https://resolutions.unep.org/resolutions/uploads/monaco_problematicavoidableplasticproducts.p
223. Sri Lanka. Contact Group 01 Submission to INC-3. (2023). https://resolutions.unep.org/resolutions/uploads/sri_lanka_-_submisison_-_contact_group_1-part_2_3-promatic_plastics.pdf
224. Malaysia Statement to INC-3 (2023). https://resolutions.unep.org/resolutions/uploads/malaysia_part_2_item_3_4_18_nov.pdf
225. Brazil Statement to Contact Group 1 at INC-3 (2023). https://resolutions.unep.org/resolutions/uploads/brazil_exemptions.pdf
226. Yee, D. P., Samo, T. J., Abbriano, R. M., Shimasaki, B., Vernet, M., Mayali, X., Weber, P. K., Mitchell, B. G., Hildebrand, M., Decelle, J., & Tresguerres, M. (2023). The V-type ATPase enhances photosynthesis in marine phytoplankton and further links phagocytosis to symbiogenesis. *Current Biology*, 33(12), 2541–2547.e5. <https://doi.org/10.1016/j.cub.2023.05.020>
227. Hook, B. (2023, May 31). *Phenomenal Phytoplankton: Scientists Uncover Cellular Process Behind Oxygen Production*. <https://scripps.ucsd.edu/news/phenomenal-phytoplankton-scientists-uncover-cellular-process-behind-oxygen-production#:~:text=Scientists%20have%20long%20recognized%20the,of%20the%20oxygen%20on%20Earth>
228. Kvale, K., Hunt, C., James, A., & Koeve, W. (2023). Regionally disparate ecological responses to microplastic slowing of faecal pellets yields coherent carbon cycle response. *Frontiers in Marine Science*, 10, 1111838. <https://doi.org/10.3389/fmars.2023.1111838>
229. Woods Hole Oceanographic Institution. (n.d.). *Phytoplankton*. <https://www.whoi.edu/know-your-ocean/ocean-topics/ocean-life/ocean-plants/phytoplankton/#:~:text=They%20are%20what%20is%20known,can%20penetrate%20to%20power%20photosynthesis>
230. Yadav, D. K., & Kumar, R. (2023). Microplastic effects in aquatic ecosystems with special reference to fungi–zooplankton interaction: Identification of knowledge gaps and prioritization of research needs. *Frontiers in Ecology and Evolution*, 11, 1279589. <https://doi.org/10.3389/fevo.2023.1279589>
231. Guerrini, F., Lobelle, D., Mari, L., Casagrandi, R., & Van Sebille, E. (2023). Modeling carbon export mediated by biofouled microplastics in the Mediterranean Sea. *Limnology and Oceanography*, 68(5), 1078–1090. <https://doi.org/10.1002/lno.12330>
232. Desforges, J.-P. W., Galbraith, M., & Ross, P. S. (2015). Ingestion of Microplastics by Zooplankton in the Northeast Pacific Ocean. *Archives of Environmental Contamination and Toxicology*, 69(3), 320–330. <https://doi.org/10.1007/s00244-015-0172-5>
233. Nanthini Devi, K., Raju, P., Santhanam, P., & Perumal, P. (2022). Impacts of microplastics on marine organisms: Present perspectives and the way forward. *The Egyptian Journal of Aquatic Research*, 48(3), 205–209. <https://doi.org/10.1016/j.ejar.2022.03.001>
234. IUCN Issues Brief. Ocean Deoxygenation. <https://www.iucn.org/resources/issues-brief/ocean-deoxygenation#:~:text=Ocean%20deoxygenation%20may%20also%20influence,atmosphere%2C%20contributing%20to%20further%20warming>
235. UNEP. ‘Turning off the Tap: How the world can end plastic pollution and create a circular economy. Topic Sheet: Just Transition.’ (2023). <https://www.unep.org/resources/turning-off-tap-end-plastic-pollution-create-circular-economy>
236. Groups of States that have stressed the importance of sustainable plastic consumption and production and/or circularity at INC-3 in their written statements: Africa Group, Asia Pacific Group, COBSEA, EU, GRULAC, HAC, PSIDS.
237. Sharif, A., Sadaf, F., & Aman, E. (2023). Domestic Plastic Consumption Patterns: A Data-Informed Sociological Analysis of Education and Behaviour Among Homemakers. *The Asian Bulletin of Big Data Management*, 3(1). <https://doi.org/10.62019/abbdm.v3i1.47>
238. Porta, R. (2021). Anthropocene, the plastic age and future perspectives. *FEBS Open Bio*, 11(4), 948–953. <https://doi.org/10.1002/2211-5463.13122>
239. Schröder, P. (2020). Promoting a just transition to an inclusive circular economy. <https://doi.org/10.13140/RG.2.2.24974.59204>
240. Contact Group 1 Co-facilitators’ summary of discussions INC-3, Nairobi, 13-19 November 2023, 5.States that have expressed support for the inclusion of just transition in the treaty at INC-3, whether in their pre-session submissions, in-session submissions or their written statements: Africa Group, AOSIS, GRULAC, PSIDS, Angola, Antigua and Barbuda, Argentina, Brazil, Chile, Colombia, Egypt, El Salvador, EU, Guatemala, Guinea Bissau, India, Indonesia, Iran, Jamaica, Kenya, Kuwait, Malaysia, Mexico, New Zealand, Nigeria, Pakistan, Panama, Peru, Philu Republic of Congo, Republic of Korea, Saud Arabia, South Africa, Sri Lanka, Tunisia, Uganda, UK, Uruguay, Venezuela, Viet Nam.

241. Scientists' Coalition for an Effective Plastics Treaty, O'Hare, P., Nøklebye, E., Stoett, P., & Kortsen, K. (2023). *Policy Brief: Towards a Just Transition Away from Plastic Pollution*. Zenodo. <https://doi.org/10.5281/ZENODO.10021005>.
242. IISD. Just Transition. <https://www.iisd.org/topics/just-transition>, <https://climatejusticealliance.org/just-transition/>
243. UN-Habitat and NIVA. 'Leaving no one behind - How a global instrument to end plastic pollution can enable a just transition for the people informally collecting and recovering waste. (2022). https://unhabitat.org/sites/default/files/2022/11/un-habitat_niva_report_leaving_no_one_behind_1.pdf
244. ILO. "ILC.111/Record No. 7A: Proposed resolution and conclusions on a Just Transition" (International Labour Conference - 111th Session, 2023).
245. Dalabajan, D., Mayne, R., Bobson, B., Qazzaz, H., Ushie, H., Ocharan, J., Farr, J., Romero, J., Priego, K., Gomez Correa, L. V., Gomez Ortiz, L., Soggi, L., Buenaventura Goldman, M., Rosario Felizco, M., Dabi, N., Chauke, N., Haq, O., Martinez Arellano, P., & Mojica Enciso, S. P. (2022). *Towards a Just Energy Transition: Implications for communities in lower- and middle-income countries*. Oxfam. <https://doi.org/10.21201/2022.9936>
246. Schroeder, P., & Barrie, J. (n.d.). Is going circular just? Environmental justice and just transition – key elements for an inclusive circular economy. *Field Actions Science Reports, Special Issue 24*. <https://journals.openedition.org/factsreports/6864>
247. Fuady, M. I. N., & Ishak, N. (2023). Green restorative justice approach in environmental issues to attain the sustainable development. *IOP Conference Series: Earth and Environmental Science, 1190*(1), 012038. <https://doi.org/10.1088/1755-1315/1190/1/012038>
248. Nordic Council of Ministers. 'Towards Ending Plastic Pollution: 15 Global Policy Interventions for Systems Change' (2023). <https://www.norden.org/en/publication/towards-ending-plastic-pollution>
249. The Galapagos Conservation Trust Submission for INC-3 (Part A) (2023). https://resolutions.unep.org/resolutions/uploads/galapagos_conservation_trust_15082023_a.pdf
250. ILO Declaration on Fundamental Principles and Rights at Work and its Follow-up, adopted at the 86th Session of the International Labour Conference (1998) and amended at the 110th Session (2022).
251. Barford, A., & Ahmad, S. R. (2021). A Call for a Socially Restorative Circular Economy: Waste Pickers in the Recycled Plastics Supply Chain. *Circular Economy and Sustainability, 1*(2), 761–782. <https://doi.org/10.1007/s43615-021-00056-7>
252. Nordic Council of Ministers. 'Towards Ending Plastic Pollution: 15 Global Policy Interventions for Systems Change' (2023). <https://www.norden.org/en/publication/towards-ending-plastic-pollution>
253. Velis, C. A., Hardesty, B. D., Cottom, J. W., & Wilcox, C. (2022). Enabling the informal recycling sector to prevent plastic pollution and deliver an inclusive circular economy. *Environmental Science & Policy, 138*, 20–25. <https://doi.org/10.1016/j.envsci.2022.09.008>
254. ILO R204 - Transition from the Informal to the Formal Economy Recommendation, 2015 (No. 204).
255. First National People of Color Environmental Leadership Summit. (1991). Principles of Environmental Justice.
256. Ferronato, N., & Torretta, V. (2019). Waste Mismanagement in Developing Countries: A Review of Global Issues. *International Journal of Environmental Research and Public Health, 16*(6), 1060. <https://doi.org/10.3390/ijerph16061060>.
257. Almack, A., Arora, K., Ananthakrishnan, L., Shekar, N., Chandran, P., Singhal, P., Dias, S., & Krishnan, S. (2021). Extended Producer Responsibility and Informal Waste Workers—From Integration to Sustainable Inclusion (Issue 1) [Hasiru Dala Issue Series]. <https://hasirudala.in/wp-content/uploads/2021/06/Extended-Producer-Responsibility-and-Informal-Waste-Workers.pdf>
258. Soumyajit Kar, Lead, Sustainable Trade, at the World Economic Forum, during UNEP GEN Webinar entitled "Implementing a Treaty to End Plastic Pollution: A Holistic Approach to Resource Mobilization & Financing for Systems Change" held online on Wednesday, February 7, 2024.
259. Talbott, T., Chandran, P., Allen, C., Narayan, L., and Boampong, O. 'Extended Producer Responsibility (EPR) and Waste Pickers'. WIEGO Technical Brief No. 15 (2022). <https://www.wiego.org/sites/default/files/publications/file/technical-brief-no-15.pdf>
260. Juan, R., Domínguez, C., Robledo, N., Paredes, B., Galera, S., & García-Muñoz, R. A. (2021). Challenges and Opportunities for Recycled Polyethylene Fishing Nets: Towards a Circular Economy. *Polymers, 13*(18), 3155. <https://doi.org/10.3390/polym13183155>.
261. Richardson, K., Hardesty, B. D., Vince, J., & Wilcox, C. (2022). Global estimates of fishing gear lost to the ocean each year. *Science Advances, 8*(41), eabq0135. <https://doi.org/10.1126/sciadv.abq0135>.
262. Gilman, E., Musyl, M., Suuronen, P., Chaloupka, M., Gorgin, S., Wilson, J., & Kuczynski, B. (2021). Highest risk abandoned, lost and discarded fishing gear. *Scientific Reports, 11*(1), 7195. <https://doi.org/10.1038/s41598-021-86123-3>
263. Environmental Investigation Agency. Rep. Convention on Plastic Pollution – Essential Elements – Fishing Gear, (2022). <https://eia-international.org/report/convention-on-plastic-pollution-essential-elements-fishing-gear/>
264. UNEP. 'Fishing nets: the double-edged plastic swords in our ocean.' (2023). <https://www.unep.org/technical-highlight/fishing-nets-double-edged-plastic-swords-our-ocean>
265. Gilman, E., Humberstone, J., Wilson, J. R., Chassot, E., Jackson, A., & Suuronen, P. (2022). Matching fishery-specific drivers of abandoned, lost and discarded fishing gear to relevant interventions. *Marine Policy, 141*, 105097. <https://doi.org/10.1016/j.marpol.2022.105097>
266. Fennell, H. L. (2023). Changing behavior: Can intervention design from the public health sector help solve the problem of fishing gear conflict? *Marine Policy, 151*, 105527. <https://doi.org/10.1016/j.marpol.2023.105527>
267. Enaleia: <https://enaleia.com/>



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