Policy Brief

Removal of existing and legacy plastic pollution

Key messages

- Removal and remediation of plastic pollution is necessary but cannot solve the global plastics crisis.
- Harmonized standards and methods for safe and sustainable removal and remediation are crucial.
- Science-based criteria and regulations are needed to ensure, through assessments, that the environmental benefits of removal activities outweigh their costs.
- When prioritising areas for removal and/or remediation, the volume and hazardousness of plastic pollution as well as the function, productivity and vulnerability of ecosystems should be considered.
- Removal activities should be socially just, transparent, and comply with health and safety standards and responsible handling of collected waste.

It is important to recognize that removal efforts alone cannot solve the plastic problem and that they fail to address the scale or wider issues of plastic pollution. The only sustainable, safe, long-term, and effective solution to the global plastics crisis is to significantly reduce, simplify and detoxify plastic polymers and products, and to establish and implement measures to prevent their release to the environment along their full life cycle.

In the transition towards this goal, targeted removal of existing plastic pollution and remediation of environments contaminated with legacy plastics and associated chemicals is necessary to mitigate the detrimental impacts on ecosystems, biodiversity, and human health, and to restore natural habitats and their functions. Legacy plastic pollution refers to existing plastics pollution that cannot be reused or recycled and that are typically highly degraded and embedded in nature.

There are currently no international regulations on the removal and remediation of plastics pollution. A legally binding instrument to end plastics pollution should mandate safety, sustainability, and transparency criteria for the removal and remediation of plastic pollution, as identified by an independent body of experts. These criteria will support effective implementation of the treaty, including globally harmonized standards, methods, social and environmental baselines, monitoring, reporting and compliance.

What are key factors to consider?

Environmentally sound plastics removal

- Establishing independent evidence-based criteria, environmental and social baselines, monitoring and reporting, and guidelines, could ensure that existing and legacy plastic pollution is removed and sites remediated in a safe and environmentally sound manner, with health, environmental (1) and socio-economic benefits justifying financial costs.
- Plastic removal and remediation activities, whether manual or mechanical, can cause harm to aquatic and terrestrial life if (i) organisms are captured, disturbed, killed, or injured in the process (2); (ii) habitats and important organic matter are removed (1,3); and if (iii) removal causes the remobilization of sequestered waste (4) and (iv) secondary micro- and nanoplastics and chemicals leached from degrading plastics are dispersed into soils, rivers and the ocean. Additional risks may include the spread of adsorbed chemicals, pathogens, antibiotic resistance genes, or invasive species on plastic surfaces.
- A global legally binding instrument is needed that applies a precautionary approach that weighs the potential negative consequences of plastics removal against the potential benefits and identifies ways to prevent or mitigate risks. Such analyses must also factor in greenhouse gas emissions from plastics removal (5) and remediation activities.
- Priority areas for plastics removal and remediation may be based on (i) the amount of plastic waste (e.g., accumulation areas due to environmental characteristics or human activities) and (ii) type of plastic waste (6), (iii) threat to specific habitats or biota (7), (iv) ecosystem functions and services, (v) risk of mobilization and dispersion of chemicals or micro- and nanoplastics, and (vi) repeated translocation of stranded plastic waste.
- There are only limited management options for collected plastic waste. Ocean plastics are typically degraded and biofouled, and they often contain a range of hazardous chemicals and adsorbed co-pollutants, making them unsuitable for recycling (8). Landfill or thermal treatment are the typical final destinations of these wastes, although dumping and open burning are also common endpoints. All of these lead to the release of greenhouse gases (9,10), micro- and nanoplastics (11,12), plastic chemicals (13), and toxic fumes and other residues (14).

Cost-effective plastics removal

- Currently, it is difficult to know if removal and remediation actions, and in particular plastic removal technologies, are cost-effective (15,16), and how costs compare between manual and mechanical removal, or the effectiveness of operations in rivers and coastal areas versus the high seas (5). Improved reporting of costs and science-based guidelines for cost-benefit analyses of removal activities could shed light on these uncertainties.
- The development of methodologies to identify areas (i) with high levels of plastic pollution (17,18,19) (ii) that are particularly vulnerable to the effects of plastics pollution (7), or (iii) with a high risk of pollutant transfer to other environments (e.g., from soil to water) could contribute to more cost-effective removal and remediation efforts.
- To support monitoring and reporting efforts, mapping and plastic removal activities should use independent evidence-based methods and criteria for data collection to establish adequate baseline information on the types and amounts of plastic pollution in the environment and its movement in air, soil, sediment, water and ecosystems.

Socially just plastics removal

- In low-GDP countries, most of the collection and sorting of plastic waste is done by waste pickers, who number at least 20 million people worldwide (20). Despite the well-documented problems caused by mismanaged plastic waste, waste picking offers significant job opportunities for people in low-income communities, Small Island Developing States (SIDS) and informal settlements. It is important to ensure that waste pickers are involved in the planning and implementation of plastic removal activities.
- Provisions are needed to ensure that removal and remediation activities comply with health and safety standards, and that adequate personal protective equipment and training is provided.
- Plastic removal sites should be prioritized based on a hierarchy of needs, and funding and resources for removal and remediation should be distributed equitably, recognizing that plastic pollution is a transboundary challenge and disproportionately affects vulnerable communities.

Transparent plastics removal

- Full transparency is needed in all plastic removal operations, including disclosure of plastic product data (e.g. chemical content of plastics), trackability, traceability, and financial flows.
- Responses, including extended producer responsibility guided by the polluter pays principle should internalize the full cost of plastic production. These schemes should be fully transparent, including multistakeholder and rights-holder participation, and should not involve plastics offsetting practices or greenwashing (21).
- In addition to data on the location, type and amount of plastics collected, the fate of the material must be well documented to ensure that the collected waste is managed safely and sustainably.
- Adequate reporting data can help to identify new sources of pollution and associated hazards, to monitor trends over time in response to treaty provisions, and to identify areas requiring additional strengthening and support.

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