

The Global Plastics Treaty - What science shows are essential elements for its success

Plastics pollution causes widespread **harm** (Carney Almroth et al. 2024) including adverse impacts on **human health** (Deeney et al. 2024), the **environment, climate** (Bauer et al. 2022), and **biodiversity** (da Silva et al. 2023; Daghighi et al. 2023); and it has negative effects on **human rights** (UNGA 2022; O'Meara 2022) **and the economy** (Cordier et al. 2024; Trasande et al. 2024). These impacts occur across all stages of the plastics life cycle from raw material extraction to remediation (Bergmann et al. 2023; Brander et al. 2024).

Approximately 460 million tons of plastics are produced annually, and it is expected that under a business-as-usual scenario, production will triple by 2060 (Baztan 2024). This threatens all three pillars of sustainability: environmental, social, and economic (de Sousa 2021; Rognerud et al. 2022; Stoett et al. 2024). The scientific evidence is clear that these issues cannot be addressed by waste management alone and will require primary plastics production reduction (Baztan et al. 2024; Cowger et al. 2024; Zheng & Suh, 2019; OECD 2024).

*Peer-reviewed scientific evidence shows that **an effective treaty** must have a well-defined scope and effective means of implementation including the following **globally and nationally mandated** key elements:*

- A scope that addresses the **full life cycle of plastics to protect human health and the environment and to end plastics pollution by 2040** (Bergmann et al. 2022).
- **Reduction targets for primary plastics production** and reduction incentives that are ambitious and legally binding, for all plastics including plastic chemicals and plastic alternatives (Baztan et al. 2024).
- **Restrictions and bans on chemicals of concern** in plastics, utilising hazard and group-based approaches. Such global and efficient regulation is essential because only a small fraction of plastic chemicals are regulated under current multilateral environmental agreements (UNEP 2023; Wagner et al. 2024).
- Provisions for the **reduction of the production and shedding of micro- and nanoplastics** across the full life cycle of plastics, given they account for around one-quarter of all plastic pollution, are harmful, and cannot be removed from the environment (Thompson et al. 2024).
- **Phaseouts of non-essential plastic chemicals, materials, and products** and the application of the essential-use approach to allow time-bound exemptions for hazardous plastics that are critical for the health, safety, and functioning of society, and where no safer and more sustainable alternatives and substitutes are currently available (Deeney et al. 2024).
- **Harmonized safety, environmental, and sociocultural sustainability criteria** to be applied to plastics, chemicals, materials, products, technologies, alternatives and substitutes, with extensive upfront testing (Scientists Coalition 2024).
- Adherence to the **principles of the waste hierarchy**, prioritizing reduction, reuse and refill systems, and **improved waste management strategies, with safe and environmentally sound collection, treatment and disposal** (SDG 11.6.1; Syberg et al., 2024).
- Requirements for **transparency, reporting and monitoring** of plastics chemicals, materials, products and their supportive technologies, systems and services. Harmonized criteria that include measurable indicators will be needed for compliance and enforcement throughout the supply chain (Brander et al. 2024).
- A dedicated **financial mechanism, as well as technical cooperation, capacity building, and cooperative and trade-related provisions**, that support parties in meeting their obligations to the treaty (Maes et al. 2023) and ensure a just transition for affected populations, communities, and workers across the full plastics life cycle (O'Hare et al. 2023; Dauvergne 2023).
- A dedicated **independent science policy interface** composed of a diverse range of plastics pollution experts and rights holders, with clear mechanisms to manage and mitigate conflicts of interest (Thompson et al. 2024).