

EDITORIAL

Optimism for a global plastics treaty

The lack of consensus at the United Nations (UN) global plastics treaty negotiations in December may seem like a setback, but declaring the talks a failure is premature. The process has not collapsed but has been extended, with further negotiations anticipated in 2025. This offers a crucial opportunity for the scientific community to assert its role in shaping a robust, evidence-based agreement to address the global plastic pollution crisis. Great progress has been made in building a strong scientific baseline that will be essential to address pivotal areas of contention.

Since negotiations began in November 2022, they have been marked by divergent political perspectives on the causes and solutions to the plastic pollution crisis. One group, led by countries with strong fossil fuel interests, frames plastic pollution primarily as a waste management issue. Such a perspective avoids constraints on the production of primary plastic polymers, the vast majority of which are derived from fossil fuels. The group emphasizes downstream strategies toward the bottom of the waste hierarchy, such as improved waste collection, recycling, and disposal. By contrast, a broader coalition of over 100 nations identifies the linear plastics economy as the fundamental driver of plastic pollution. They advocate for a fair and just circular plastics economy, targeting solutions across the whole life cycle, including reductions in plastic production, eliminating problematic and unnecessary plastics, and promoting reuse and refill systems to retain materials within the economy longer. Negotiations have been delayed and sidetracked by struggles to reconcile these positions.

Despite political divergence, there is strong scientific consensus that effectively tackling plastic pollution requires coordinated interventions across the entire plastics life cycle. Modeling by the Organization for Economic Cooperation and Development shows that comprehensive policies addressing production, design, and disposal could reduce plastic pollution by 96% by 2040, compared to business as usual. By contrast, waste management-focused approaches deliver only a 55% reduction over the same period. Countries advocating for a focus solely on waste management argue that upstream measures, particularly production limits, overstep the mandate of the UN resolution that initiated treaty nego-

tiations. However, this contradicts the resolution's call for an agreement "based on a comprehensive approach that addresses the full life cycle of plastic."

During the final evening of negotiations, a clear shift in tone emerged. Rwanda, backed by 85 countries, called for a treaty addressing the entire life cycle of plastics and urged supportive nations to "stand up for ambition." The overwhelming majority of participants in the room rose to their feet, cheering in support. One by one, the majority of countries pledged their commitment to an ambitious and holistic treaty. Delegations accepted an extension to negotiations and, despite criticism of its content from most delegations, agreed to use the version of the treaty developed by the chair as the starting point for the next session.

Although important, the rhetorical shift does not guarantee a strong treaty. Several key unresolved issues remain, where consensus and scientific input are essential. In particular, the scientific community is crucial in making the case for the treaty extending across the entire plastics life cycle, defining sustainable plastic production levels, and ensuring that a just transition is embedded across the treaty. Further, given that over 10,000 chemicals in plastics lack robust hazard data, defining chemicals of concern and how to regulate their use in plastics is

a critical scientific question. In addition, transitioning to a circular plastics economy offers a transformative pathway to address plastic pollution comprehensively. Emphasizing design for reuse and refill, improving resource efficiency, and influencing consumer behavior promise long-term sustainability but require carefully planned evidence-based interventions. An equitable and sustainable finance deal also is needed to support treaty implementation in low- and middle-income countries.

Beyond the need for independent, robust scientific evidence during negotiations, the role of science in long-term treaty implementation demands attention as well. A standing science-policy panel could provide a mechanism for assessing the treaty's progress and effectiveness and to ensure that new evidence is continuously integrated, enabling the treaty to adapt and evolve on the basis of the best available science.

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*S.F. has received funding from the United Nations Environment Programme, World Bank, World Economic Forum, Natural Environment Research Council (NERC), Economic and Social Research Council, Aquapak Ltd, Defra, and the Flotilla Foundation. He is a member of the United Nations International Resource Panel and is the NERC Agenda Setting Fellow for Plastic Pollution.