

Questionnaire on implications of plastic pollution for the full enjoyment of human rights

UN Human Rights Council Advisory Committee

Core questions

1. What are the human rights impacts that you associate with the different phases of the full life-cycle of plastics?

- **Extraction & production (fossil fuels, monomers, polymers, additives):** Occupational and community exposures to toxic chemicals and air pollution impact the
 - rights to health and to a clean, healthy and sustainable environment (Scientists' Coalition for an Effective Plastics Treaty, 2023).
- **Use phase:** Ingestion exposure can occur when chemicals migrate from food contact articles into food. Evidence synthesis shows that plastic food contact materials (FCMs) are not inert and therefore transfer their chemical constituents in complex chemical mixtures, including non-intentionally added substances (NIAS), bisphenols, phthalates and PFAS (Geueke, et al., 2022). Additionally, the normal and intended use of plastic food contact material leads to the release of micro- and nanoplastics (MNPs) into foodstuffs (Zimmermann, et al., 2025). Many NIAS remain unknown and are therefore not subject to risk assessment, implying that the health impacts of plastics, even when used in contact with foodstuffs, are not fully known. Nevertheless, there are at least 441 known hazardous chemicals present in plastic FCMs, 308 of which are known to migrate into food or food simulants, and for 87 known hazardous plastic chemicals, human exposure has been shown. This means that plastic FCMs are a relevant and plausible exposure source to hazardous plastic chemicals

(Geueke, et al., 2022). Importantly, this exposure can be mitigated by suitable policy interventions.

- **Waste management & end-of-life:** For food-contact plastics, recycling can introduce or concentrate contaminants and non-intentionally added substances, complicating safe circularity (Geueke, Phelps, Parkinson, & Muncke, 2023). What is more, plastic food contact materials remain among the most found items in marine litter and coastal cleanups (Morales-Caselles, et al., 2021) (Ocean Conservancy, 2025). Reducing the amount of single-use plastic food packaging will reduce plastic pollution.

3. What measures (legislative, administrative, institutional, or other), if any, exist to address plastics and plastic pollution? Have human rights implications been taken into account in their adoption and implementation? Are there good practices or lessons learned in regulating plastics and plastic pollution that include a human rights-based approach?

- **International:** UNEA Resolution 5/14 mandates negotiation of a legally binding instrument on plastic pollution (full lifecycle).
- **National/subnational:** product bans/restrictions (e.g., specific single-use plastics), reuse incentives, monitoring for microplastics in drinking water, and chemical restrictions in plastics are emerging but fragmented.

4. What gaps or challenges in existing national, regional and international policies and legal frameworks have you observed? What recommendations do you have in order to address the gaps? Please, list them according to priority.

1. **Gap:** policies focus downstream; insufficient upstream controls on virgin polymer production and on hazardous chemicals in products.
Recommendation: adopt globally coordinated targets to reduce primary plastic production to sustainable levels and to phase out chemicals of concern (with attention to contact-sensitive uses such as food packaging) (Zimmermann, et al., 2022).
2. **Gap:** fragmented/uneven national rules.
Recommendation: harmonized global obligations to create a level playing field and reduce loopholes. Ban the intended use of known hazardous chemicals for plastic food contact material manufacture and require much higher standards for inertness of all food contact materials, plastics and alternatives—to reduce migration and simplify information requirements for chemical risk assessment. Promoting the use of inert food contact materials also enables non-toxic circularity for food packaging, as inert materials are suitable for reuse.
3. **Gap:** lack of transparency on plastic and food contact chemicals (including NIAS) and hazard data gaps.
Recommendation: require disclosure of intentionally used substances and known NIAS and implement hazard-based group restrictions/phase-outs (e.g., PFAS) (Wiesinger, et al., 2026). Require higher material inertness for food contact materials.
4. **Gap:** over-reliance on recycling despite technical limits and chemical contamination risks.
Recommendation: prioritize prevention and reuse systems that can deliver safe, non-toxic circularity; apply chemical safety requirements to recycled content and recycling processes (to avoid contaminant/NIAS accumulation in food contact cycles).
5. **Gap:** focus on chemical-by-chemical risk assessment for chemicals used in the manufacture of plastics is time consuming and ineffective

Recommendation: determine if a plastic food contact article falls under the Essential Use category, then optimize the material for inertness and in a last step determine hazards of migrating chemicals, to determine health risks across the full life-stages (Muncke, et al., 2023).

5. What are the particular impacts of plastics and plastic pollution on human rights of individuals, groups and peoples in vulnerable situations (e.g., marginalized communities, workers at heightened risk of occupational exposure, in particular waste pickers/reclaimers, peasants, people living in poverty, low-income households, children, youth, women, persons with disabilities, people of African descent, older persons, Indigenous Peoples, coastal communities), and how should these be mitigated, remediated and prevented?

- Children and pregnant people are particularly sensitive to chemical exposures. Food contact materials are an exposure source via diet (migration into food), and evidence synthesis indicates thousands of food-contact-related chemicals have been detected in humans (Geueke, et al., 2022) (Geueke, et al., 2025) (Muncke, Touvier, Trasande, & Scheringer, 2025). Additionally, 189 potential mammary carcinogens have been measured in FCMs. 143 (76%) were detected in plastic food contact articles (Parkinson, Geueke, & Muncke, 2024). Because mammary tissue is a site of particular vulnerability to hormonally active and carcinogenic chemicals, this finding raises specific concerns for women's health.

7. What are the measures to protect human rights in the transition to sustainable economies and societies and what lessons could be learnt from other sectors in this regard? Are there alternatives to or substitutes of plastics? What are their social and human rights implications?

- **Alternatives/substitutes for food contact applications:** expand reuse/return systems and favor durable, inert materials (e.g., glass, stainless steel, glazed ceramics), while acknowledging that some non-plastics (e.g., paper with functional coatings) can also contain and leach hazardous chemicals (PFAS etc.) and require appropriate chemical safety controls that are currently lacking (Muncke, et al., 2023)
- **Key lesson:**
 - Material inertness is an underexplored but easy-to-apply approach to safeguard human health and improve environmental performance. To implement, novel testing methods are required. High material inertness results in reduced information requirement for risk assessment of migrating chemicals, and at the same time enables non-toxic circularity, because inert materials are not or much less prone to absorbing chemical contaminants during use, reuse and recycling. Also, inert materials have a higher material value, leading to economic incentives for prevention of littering.
 - Upstream reduction of production/consumption is identified as the most effective lever; recycling alone is insufficient and can increase chemical complexity (Scientists' Coalition for an Effective Plastics Treaty, 2024)

9. What strategies or initiatives (local, national, regional, or international) are most effective in raising awareness about human rights implications of plastics across its lifecycle, reaching out to all relevant stakeholders and rights-holders, including consumers and societies at large?

- **Science-to-policy statements and briefings:** independent [Scientists' Coalitions for an Effective Plastics Treaty](#) communicating peer-reviewed evidence to negotiators and the public.
- **Health framing:** positioning plastics as a health and human-rights issue across the lifecycle (not only waste) increases salience for ministries and communities.

10. What specific barriers in business conduct hinder efforts to end plastic pollution and reduce plastic production? Are there any examples on how these barriers have been addressed or overcome? What (human rights-based) minimum standards should States impose on plastic producers to hold them responsible for the entire lifecycle of their products?

- **Barriers:** externalization of health/environment costs; limited transparency on chemicals; fragmented rules enabling regulatory arbitrage; lobbying/conflict of interest risks in policymaking.
- **Examples of addressing barriers:** calls for harmonized global obligations and conflict-of-interest mitigation in treaty processes; disclosure-aligned finance standards increasing scrutiny.
- **Minimum standards (human-rights based):** lifecycle responsibility plus upstream reduction; mandatory disclosure of chemicals (including additives and known NIAS) and supply-chain transparency; hazard-based phase-out of chemicals of concern in plastics and food contact materials (e.g., class-based restrictions for PFAS); monitoring, grievance mechanisms, and remedy; meaningful stakeholder participation and conflict-of-interest safeguards.

11. How should the State regulate chemicals used in plastics, including additives to protect the rights to health and a clean, healthy and sustainable environment? Do States apply the precautionary principle or approach to plastic associated chemicals? If not, what legal or institutional barriers prevent the application of this principle?

- **Regulate chemicals as central to plastics (including food contact):** require identification and disclosure of chemicals/additives and known NIAS; restrict/phase out chemicals of concern using hazard-based criteria; and treat sensitive applications (e.g., food contact) as priority for prevention because exposure occurs via ingestion
- **Use precaution/prevention:** given major data gaps for many plastic chemicals, apply precautionary approaches to prevent harm where evidence is incomplete.
- **Common barriers:** lack of hazard/exposure data for most known food contact chemicals (large harmonized hazard-data gaps), proprietary chemical information, and complexity/mixtures across products and recycled materials; these barriers undermine application of precaution in practice.

12. What is the national framework to ensure access to information on plastics-related risks and harms, including identified hazards and contamination (e.g., across the plastics lifecycle and related health and environmental impacts)?

- **Core elements:** public right-to-know on chemicals in products and releases (including additives and NIAS), accessible registers/monitoring data, and product/supply-chain disclosure. A practical model is to support open, queryable evidence bases linking (i) chemicals listed for use, (ii) chemicals detected in materials/migrates, (iii) chemicals detected in humans, and (iv) hazard prioritization (Wiesinger, et al., 2026).

Questions for academia, public health and scientific institutions

1. Which impacts of plastics and plastic pollution on human rights and in relation to which affected communities/groups of individuals do you find most under-researched and why?

- **Chemical-mixture impacts:** under-researched mixture effects and NIAS in migrates/extracts from food contact materials; most known food contact chemicals lack harmonized hazard data, limiting risk prevention and prioritization.
- **Assessing material inertness:** novel test methods are urgently needed to determine the overall migration of chemicals from plastic FCMs and its alternatives and substitutes. Improving inertness has high potential to reduce human exposure and increase material durability, creating economic incentives for reuse and recycling.

2. What is the role for the precautionary approach and what for the preventive approach?

- **Precautionary approach:** act to prevent harm when credible evidence exists but full scientific certainty is lacking. This is particularly relevant given major data gaps for many plastic chemicals and mixture effects.
- **Preventive approach:** stop pollution at source through upstream measures (e.g., reducing production/consumption, eliminating chemicals of concern) rather than relying on end-of-pipe controls. (Scientists' Coalition for an Effective Plastics Treaty, 2024)

3. How would you suggest improving existing policy and legal frameworks to effectively tackle the implications of plastic pollution on human rights and respect, protect and ensure the right to science?

- **Make health & human rights explicit objectives:** embed the right to health and a clean, healthy and sustainable environment across lifecycle controls.
- **Strengthen right-to-science conditions:** mandate chemical disclosure and data-sharing (including for polymers/additives), enabling independent research and informed regulation.
- Remove authorization for the use of known hazardous chemicals in the manufacture of plastic food contact materials and other types of plastics in sensitive applications (packaging for personal care products and cosmetics, toys, textiles, building materials, etc.)
- **Update testing requirements for plastic FCMs and its alternatives and substitutes, based on modern science:** test all intentionally used substances as well as the overall migrating mixture for their potential to affect human health – cancers, cardiovascular disease, reproductive, metabolic, brain-related and immunological disorders. Evidence demonstrates that synthetic chemicals, including some known plastic chemicals can impact human health and contribute to these types of noncommunicable diseases that are increasing globally. To ensure that food contact plastics (and other food contact materials) are fully safe for humans and the environment, testing requirements need to be updated accordingly (Muncke, et al., 2023).
- **Introduce inertness as key material feature for food contact applications:** today's regulatory requirements do not (or only insufficiently) address the overall migrate of all chemicals leaching out of food contact plastics. Reducing the acceptable limit for the overall migrate by introducing an inertness threshold that is significantly below the current EU limit of 60 ppm can offer a simple, easily enforceable option especially for countries that lack extensive analytical chemical capabilities. As inert materials are far less prone to leaching chemicals, data

requirements for chemicals risk assessment are significantly reduced. Inert materials are also far less prone to absorbing chemical contaminants, making them suitable for safe reuse and safe recycling.

- **Adopt upstream measures:** globally coordinated production reduction targets; phase out harmful products and chemicals; avoid over-reliance on recycling.

4. Which areas of plastic related health research remains understudied especially due to lack of proprietary (chemical) data?

- **Areas most constrained by proprietary chemical data:** identification of additives and non-intentionally added substances (NIAS); toxicity and mixture effects in recycled plastics; exposure pathways and health outcomes linked to specific polymers/additive packages. Without full chemical inventories and use patterns, risk assessment, biomonitoring attribution, and safer-alternative design are impaired.

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