



Addressing the Invisible Threat: Challenges in Mitigating Microplastic Contamination

Johnalisa L. Bulasito

Biliran Province State University School of Teacher Education Biliran Campus, 6566, Philippines

Corresponding email: johnalisa.bulasito@bipsu.edu.ph

Microplastics a tiny plastic particles less than 5 millimeters in size pose a growing environmental threat that remains largely invisible to the public eye. In the Philippines, a country ranked among the top contributors to ocean plastic pollution, microplastic contamination is now being detected not only in marine ecosystems but also in drinking water, seafood, and even table salt . The increasing presence of microplastics in the environment is causing serious pollution worldwide (Lambert & Wagner, 2016; Zianinet al., 2023). Despite rising awareness, efforts to mitigate this invisible threat remain scattered, underfunded, and hampered by systemic challenges.

One of the primary barriers is the lack of localized scientific data. While international studies have revealed alarming levels of microplastics in aquatic organisms and human tissues, Philippine-based research on microplastic distribution and toxicity is still in its infancy. According to Borelle et al. (2020) And Yarahmadi et al. (2024) numerous nations have established goals to eradicate or decrease specific items like plastic bags and waste to combat plastic pollution Universities and research institutions face difficulties in accessing proper detection equipment, such as Fourier Transform Infrared (FTIR) spectroscopy, which is essential for accurate analysis. Without reliable data, it becomes difficult for policymakers to craft informed, evidence-based strategies.

Another issue is the country's poor solid waste management. An estimated 35,700 tons of garbage are generated daily in the Philippines, a significant portion of which is plastic (Coracero et al., 2021). Although Republic Act 9003, the Ecological Solid Waste Management Act, mandates proper segregation and reduction at source, implementation remains weak at the barangay level. Plastic products break down into microplastics over time due to heat, UV exposure, and abrasion. These fragments then infiltrate soil, freshwater, and marine environments, making clean-up efforts nearly impossible.

Mitigating microplastic contamination requires more than beach cleanups or bans on single-use plastics. It demands a systems-level approach that includes stricter regulation of plastic manufacturing, promotion of biodegradable alternatives, and development of waste-to-value industries. In addition, public education campaigns must go beyond simple slogans and address the full life cycle of plastic, including how consumer behavior and corporate practices contribute to microplastic generation.

Efforts from local government units (LGUs) have shown promise. For instance, some coastal municipalities have begun regulating plastic sachets in public markets and incentivizing reusable containers. A national strategy that integrates environmental education, research funding, and industrial regulation is urgently needed (Hnatuyk et al., 2024).

Moreover, the health risks of microplastic exposure remain poorly understood in the local context. Initial findings suggest that ingesting microplastics may interfere with endocrine functions, cause inflammation, or act as carriers of toxic chemicals (Lee et al., 2023). For a country where fish and rice are staple foods, the possibility of microplastic accumulation in the food chain is especially concerning. Public health



agencies must prioritize studies on how long-term exposure affects Filipino populations and develop safety thresholds to guide both industry and consumers.

The battle against microplastics is not just about environmental conservation, it is about protecting the health, food security, and sustainability of the Filipino people. As this invisible threat continues to infiltrate our ecosystems and bodies, it is imperative that mitigation efforts become visible, coordinated, and evidence-based. Only then can we begin to reclaim our waters, our food, and our future from the grip of plastic pollution.

References

- Borrelle SB, Ringma J, Law KL, Monnahan CC, Lebreton L, McGivern A, et al. Predicted growth in plastic waste exceeds efforts to mitigate plastic pollution. *Science*. (2020) 369:1515–8. 10.1126/science.aba3656
- Coracero, Ericson & Gallego, Rb & Frago, Kristine & Gonzales, Ruel. (2021). A Long-Standing Problem: A Review on the Solid Waste Management in the Philippines. *Indonesian Journal of Social and Environmental Issues (IJSEI)*. 2. 213-220. 10.47540/ijsei.v2i3.144.
- Hnatuyk, Vitaliy & Pshenychna, Natalia & Kara, Svitlana & Kolodii, Valentyna & Yaroshchuk, Liliia. (2024). Education's role in fostering environmental awareness and advancing sustainable development within a holistic framework. *Multidisciplinary Reviews*. 7. 2024spe012. 10.31893/multirev.2024spe012.
- Lambert S., Wagner M. Characterisation of nanoplastics during the degradation of polystyrene. *Chemosphere*. 2016;145:265–268. Doi: 10.1016/j.chemosphere.2015.11.078
- Lee Y, Cho J, Sohn J, Kim C. Health Effects of Microplastic Exposures: Current Issues and Perspectives in South Korea. *Yonsei Med J*. 2023 May;64(5):301-308. Doi: 10.3349/ymj.2023.0048. PMID: 37114632; PMCID: PMC10151227.
- Yarahmadi A, Heidari S, Sepahvand P, Afkhami H, Kheradjoo H. Microplastics and environmental effects: investigating the effects of microplastics on aquatic habitats and their impact on human health. *Front Public Health*. 2024 Jun 6;12:1411389. Doi: 10.3389/fpubh.2024.1411389. PMID: 38912266; PMCID: PMC11191580.
- Ziani K, Ioniță-Mîndrican CB, Mititelu M, Neacșu SM, Negrei C, Moroșan E, Drăgănescu D, Preda OT. Microplastics: A Real Global Threat for Environment and Food Safety: A State of the Art Review. *Nutrients*. 2023 Jan 25;15(3):617. Doi: 10.3390/nu15030617. PMID: 36771324; PMCID: PMC9920460.

ARTICLE DETAILS

STL-0000007; Received: August 05, 2025; Accepted: August 07, 2025; Published: August 09, 2025

CITATION:

Bulasito, Johnalisa L. (2025). Addressing the Invisible Threat: Challenges in Mitigating Microplastic Contamination. *Sci-Tech Lens: Essays and Reviews*. DOI: 10.64591/gf5c7m40

COPYRIGHT

Copyright © 2025 by author(s). *Sci-Tech Lens: Essays and Reviews* is published by Harness Mind Publishing. This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<https://creativecommons.org/licenses/by/4.0/>), allowing redistribution and reproduction in any format or medium, provided the original work is cited or recognized.