

Emerging Concern and Current Knowledge of Microplastic in Ethiopia

Shimelis Kebede

(PhD), Associate, Chemical and Environmental Engineering,
School of Chemical and Bio Engineering,
Addis Ababa Institute of Technology, Addis Ababa University

Abstract

Plastic production, product and packaging design, and how plastic products are managed after use are all highly unsustainable and harmful to both human health and nature. According to previous research, the total amount of imported plastic consumption in 33 African countries in the form of polymers and products was 118 million tonnes over a 27-year period (1990 to 2017). Domestic consumption and waste generation are not the only sources of plastic pollution in Africa; large quantities of plastic waste are also imported from countries that do not treat this waste locally. Ethiopia, a developing country, is now consuming plastic products due to rapid urbanization, but it lacks adequate solid waste management systems. In 2022, Ethiopia's average annual plastic use per capita is predicted to be around 3.8 kg. Every citizen in Ethiopia's capital, Addis Ababa, is estimated to generate about 51 kg of waste per year. In comparison to other continents, research on microplastic pollution has only recently begun in Africa. Almost all African countries, including Ethiopia, which has the largest lake and river, have yet to conduct microplastics pollution research on their water systems. The first baseline study on microplastics pollution assessments in Ethiopia was published in 2020. Small microplastic particles have been reported in the Ethiopian freshwater system, such as Lake Ziway and Hawassa



Lake, confirming that the pollution level is high due to anthropogenic sources. The abundance of microplastics for Lake Ziway was found to be in the range of 0.0002-385.2 mg/kg ww (35%) in fish and (400-124,000) particles/m³ in sediments. Similarly, the abundance of MPs was in the 11-74 item/m³ range near the Hawassa lake catchment area. Another study on the abundance and characterization of microplastics in major urban ditches across the Ethiopian city of Bahir Dar found that microplastics occurrence of > 0.5 mm fractions were 2.33 0.58 items/50 g in sediment and 1.33 0.58 items/50 ml in agglomerated sewage water. Only three studies on emerging microplastic pollutants have been published between 2020 and 2022. As a result, current knowledge on microplastic pollutants is very limited, and there are some associated challenges such as less government attention, a lack of comprehensive data, a lack of enforcement law, limited research, and inadequate research facilities.

Biography

Dr. Shimelis Kebede is an Associate Professor of Chemical/Environmental Engineering in the School of Chemical and Bio Engineering at Addis Ababa Institute of Technology, Addis Ababa University, where he has been since 2009. From 2017 to 2021 he served as Chairperson for Environmental Engineering at the same school. From October 2022 he has appointed as Dean for School of Chemical and Bio Engineering. He received a B.Sc. from Bahir Dar University in 2007, and an M.Sc. from the Addis Ababa University in 2011. He received his Ph.D. in Environmental Engineering from the Addis Ababa University in 2017.

His research interests include both adsorption water and wastewater treatment and advanced oxidation processes (AOPs). Heterogenous Photocatalysis for the removal of hazardous and emerging contaminants has dominated much of his work.

Over sixteen of Dr. Shimelis' research publications have undergone peer review and appeared in various journals. He has been the President of the Ethiopian Society of Chemical Engineers since 2021.