

African Rivers are Major Sinks of Plastic Pollution and Carry a Major Effect on Life in Freshwater and Marine Ecosystems



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Submission: August 18, 2017; Published: August 22, 2017

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Mini Review

The effects of environmental pollution on African Rivers from the Nile River to the Mhlathuze River in South Africa are little understood. The information on environmental bioaccumulation, bioconcentration and biomagnifications of pollutants on organisms and ecosystems is of little consequence to the average person yet environmental health disorders related to waterborne diseases remain high FAO [1]. Aquatic animals in major African rivers often mistake floating microplastic and macro plastics for food Coghlan [2]. Ingested plastics and polystyrene material (kaylites) often cause digestive disorders in fish, birds, snails and while many other forms of marine life are at risk. Pollution and littering of many waterways is disrupting the feeding and movement of aquatic life forms. Aquatic turtles have been tackled by fishermen and saved from near fatalities after tangling in plastics. Aquatic debris from discarded plastics and kaylites is building up at an alarming level in streams and rivers Brooks [3] and Coghlan [2].

The source of plastics include food, toys, build cars, telephones, lenses, glasses, televisions, jewellery, diapers, pads and even mobile vans. Plastics have transformed the 20th century but many questions have evolved about their persistence in the life cycle. Microbes living in the soil and waste water e.g. *Ideonella sakaiensis* are some of the rare species capable of secreting enzymes that break down polyethylene terephthalate plastic complex chemical monomers and polymers (*sensu* Kohei Oda of Kyoto Institute of Technology). Plastics are ingested by aquatic animals and later end up in human bodies. Synergies with other pollutants cause headaches, weakness, and respiratory gastrointestinal and kidney effects.

Studies have shown that increased styrene exposure leads to chromosomal damage, abnormal pulmonary function and cancer. Polystyrene cannot easily be reused and recycled.

Environmental laws maybe 70 years late after the initial manufacture and probably have long lag effect to being made effective. Already landfills are filled to capacity with local action in environmental clean up being mooted. Tafangenyasha and Dube [4] and Tafangenyasha *et al.* [5] have investigated which aquatic organisms in lowland African freshwater River Systems may be prone to catchment pollution. The investigations covered rivers such as the Runde River with outlets to the Indian Ocean.

Tafangenyasha [6] outlined the role local community voice can have in curbing environmental degradation. The public are often the generators of pollutants and recipients of health disorders and the solution to environmental clean environments. Municipalities of African towns and rural growth centres are often short of adequate budgets for environmental cleanup and local community voices are better custodians of clean environments. The hard approaches in environmental protection can often be replaced by soft approaches in environmental effective education and awareness as indicated in Tafangenyasha [7]. Life Cycle Analysis (LCA) often breaks down in implementation due to it being overtaken by rapid scientific discoveries of newer chemical compounds demanded by industry and consumer goods.

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DOI: [10.19080/IJESNR.2017.04.555635](https://doi.org/10.19080/IJESNR.2017.04.555635)

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