MARINE DEBRIS, MICROPLASTICS AND POLLUTION

POLLUTION AND DEBRIS

KEY POINTS

- Marine pollution is a significant threat to the Pacific, and discarded plastic waste is considered one of the priority marine pollution issues facing the region.
- Improved waste-management capacity and practices, including low-waste production and industry, resource re-use, and effective waste disposal, are vital. Wastewater and solid waste collection and management are key to preventing pollution and litter entering waterways and the ocean.[1]
- Pacific states and territories are affected not only by waste produced locally but also by waste transported in by foreign vessels and by ocean currents. Remote, uninhabited island ecosystems show impacts of marine pollution and physical presence of debris.
- Marine debris and pollution have broad economic, social and environmental impacts via:
  1. Aesthetic mechanisms: tourism and trade affected by the presence of waste;
  2. Physical mechanisms: e.g. animal wounding or entrapment, physical damage to infrastructure, hazards to navigation and safety at sea, alteration of habitats, transfer of invasive species;
  3. Financial burden of waste clean-up and management;
     - Pacific island states can be particularly vulnerable to marine litter impacts due to financial and institutional challenges in properly managing waste.
     - Marine litter has negative socioeconomic impacts, especially on poorer coastal communities; and
  4. Chemical mechanisms: ecosystem and species damage; contamination of food supply; notably the adsorption of heavy metals, organic contaminants, and other chemical pollution onto the surfaces of microplastics, which can then bioaccumulate up the food chain, including into human food sources.

HOW ISSUE LINKS TO/IMPACTS SDGs BEYOND SDG14 LIFE BELOW WATER

- SDG2: sustainable management of our marine resources is vital to achieve food security in the Pacific. Pollution threatens marine food sources for human consumption.
- SDG3: mitigation of marine pollution reduces chemical and pollution impacts on human health.
- SDG6: clean water and sanitation rely on safe, effective waste management. In small Pacific states and territories, marine and terrestrial systems are intimately linked.
- SDG10: marine pollution has global impact, but the effects will be more strongly felt by small Pacific states with subsistence economies, which also receive external waste and deliberate dumping.
- SDG11 and 12: the sustainability of Pacific cities and communities relies on the minimisation of waste generation, reducing costs, energy consumption, and the need for waste disposal.

BACKGROUND

1. **Approx. 80% of marine debris originates from land-based activities,** with inputs from shorelines or via rivers and wastewater pipelines. Inputs at sea may be from normal operations, accidental losses, or deliberate discarding such as derelict vessels. Sources include street and beach littering; improper waste management; ships including fishing vessels; aquaculture; offshore drilling; at-sea accidents; extreme natural events; construction; and coastal tourism.[2] The Pacific also has a nuclear heritage, with aging storage, e.g. on Bikini Atoll, and thousands of underwater shipwrecks that, if disturbed by natural disasters, could leak oil.[3]
2. **The most prevalent (60–80%) types of marine debris are plastic materials**,[4] considered a priority marine pollution issue facing the Pacific region.[5] Some plastics begin as chemically inert (non-toxic) but may adsorb heavy metals and other persistent, bioaccumulative and toxic substances (PBT).

3. **Microplastics are a subset of the marine debris issue.** Some microplastics are purposefully manufactured for industrial and domestic purposes ('primary' microplastics). 'Secondary' microplastics are created by the weathering and fragmentation of larger plastic objects.[3] Additional sources of microplastics include industrial emissions and sewage; cosmetics and personal care products; textiles and clothing (synthetic fibres); terrestrial transport (dust from tyres); and plastic producers and fabricators (plastic resin pellets used in plastics manufacture).[6] Microplastics are often mistaken for food by a wide range of marine species, affecting their health and passing accumulated PBT up the food chain upon consumption, including human food sources.
4. **There is substantial illegal discard of wastes by vessels in South Pacific waters**, despite existing conventions such as MARPOL, London Dumping Protocol and the Noumea Convention Dumping Protocol regulating discard of waste from shipping and fishing vessels. SPC/FFA Observer GEN-6 Forms from 2003–2015 showed over 10,000 violations, primarily from purse seiners but also long liners. Plastic discharge constituted 71% of these violations, and 71% of the incidents were from fishing vessels flagged by distant water fishing nations.
5. **The limited information available strongly suggests that marine litter is not appropriately managed in most Pacific island communities.** Many PICs have no current systematic management plan or system for marine litter prevention, management, and clean up/recovery.[7]
6. **Marine debris impacts biodiversity and human health**.[8] The problem is growing – a global review found a 49% increase in reports of marine species being entangled in and ingesting marine debris between 1997 and 2015.[9] A recent study of ingestion of plastic by fish in the Pacific region found plastic ingestion by 97% of examined fish species.[10] Additional research should target identified priority topics.[11]

1 UNEP (2016) Marine plastic debris and microplastics – Global lessons and research to inspire action and guide policy change. United Nations Environment Programme, Nairobi

2 Markic A & Costello MJ. 2016. Plastic ingestion by fish in the South Pacific. 27SM/Officials/WP.9.3.2/Att.1; Gall & Thompson. 2015. The impact of debris on marine life. Marine Pollution Bulletin 92:170-179

3 UNESCO 2010. Underwater Cultural Heritage in Oceania. 111 p

4 Markic A & Costello MJ. 2016.

5 Twenty Seventh SPREP Meeting of Officials. 2016. Marine Plastics and Debris Management. 27SM/Officials/WP.9.3.2. at 2

6 OP7, UNEP/EA.1/Res.6 (2014); UNEP, 2016.

7 SPREP, 2016. Cleaner Pacific 2025: Pacific Regional Waste and Pollution Management Strategy 2016–2025. Apia, Samoa

8 Harding 2016. Marine debris: understanding, preventing and mitigating the significant adverse impacts on marine and coastal biodiversity. Tech Series No. 83. Secretariat of the Convention on Biological Diversity, Montreal, 78 p

9 Gall & Thompson. 2015.

10 Markic. 2017. Plastic ingestion by South Pacific fish – field study. Final Report: Thesis Part 1 (draft version) publication pending

11 Vegter et al. 2014. Global research priorities to mitigate plastic pollution impacts on marine wildlife. Endangered Species Research 25:225–247