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Tiny plastic, big problem

A global initiative is needed to tackle microplastics that pose harm to drinking water and the fish food chain

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For The Straits Times

A man sitting on waste at the Ngong town dumping site, 30km south-west of Nairobi. In August, Kenya banned the production, sale and use of plastic bags, with violators facing jail and hefty fines. PHOTO: AGENCE FRANCE-PRESSE

"There's a great future in plastics" – a famous line from the 1967 film The Graduate – has turned out to be a prophetic statement. A ubiquitous part of 21st-century life, plastic is visible for some uses like product packaging, and less so for others, such as toothpaste and clothing. Plastic also constitutes an increasing share of solid waste, clogging drainage systems and contributing to flooding in cities such as Dhaka, Bangkok and Accra.

It is now the most prevalent debris found in the ocean, and with eight million more tonnes added each year, it may be more prevalent in weight than fish by 2050.

As producers find new uses for increasingly sophisticated synthetic materials, the integration of plastics into all facets of life has serious implications for public health and the environment.

While plastic has long been an environmental threat, microplastics have received more recent attention. At less than 5mm in length, these small fragments are sneaking into human diets in ways that were previously ignored.

Recent studies show that tap water in some parts of the world may be contaminated by microplastics. Also, up to 30 per cent of plastic released into oceans each year could be microplastics, entering marine food systems through run-off, wastewater effluent and illegal dumping.

Microplastics in drinking water are an emerging problem. At present, there are no accepted protocols on the monitoring of microplastics, or what should be the maximum allowable limit. National water agency PUB has carried out tests and fortunately no microplastics have been detected.

These tiny pieces of plastic have a variety of sources, from degraded or abraded plastic items to "microbeads" in personal hygiene products.

A major concern is that these plastics "act like sponges" that attract harmful chemicals, pesticides and bacteria, and are confused for food by marine life.

While chemicals associated with microplastics do not kill fish, they can severely impair liver and endocrine function. This presents both an environmental and public health concern; fish that consume microplastics include those common in human diets, such as mackerel and striped bass.

Despite the measurable threat of plastics to cities, marine environments and the global food supply, plastic use shows no sign of abating: total production in 2015 was roughly 400 million tonnes. On one uninhabited island in the South Pacific, 3,500 pieces of plastic wash ashore each day, prompting a marine scientist to describe the ocean as "plastic soup".

Addressing this seemingly intractable problem requires government intervention and lifestyle changes, but the existing decades-long war on plastic is an unproven blueprint and offers little reason for optimism.

LIMITING PLASTIC USE

Government interventions regarding plastics often focus on visible consumables such as bags and bottles. The presence of plastic bags in stores and homes, or simply blowing in the wind, is a daily reminder of society's universal dependence on plastic.

More than 40 countries tax or limit the use of plastic bags. Evidence from some shows that even modest policy interventions can have significant impacts. For example, in Britain, usage of plastic carrier bags fell by 83 per cent after the introduction of a five-pence-per-bag charge in 2015.

Some governments are going further by instituting outright bans. In August, Kenya banned the production, sale and use of plastic bags, with violators subject to imprisonment for up to four years or fines of up to US$40,000 (S$54,000). This appears to be the most stringent crackdown adopted by any country.

Western Australia became the latest Australian state to announce a ban on all single-use plastic bags, and is also introducing a deposit scheme for plastic containers.

But in the United States, progress in eliminating plastic pollution is being slowed by political headwinds: President Donald Trump has reversed the Obama administration's ban on the sale of plastic water bottles in national parks. Even under the short-lived ban, sugar-sweetened drinks in plastic bottles were still allowed.

Plastic bottles constitute 20 per cent of the waste and 30 per cent of the recyclables in Grand Canyon National Park; the exclusion of soda from the ban was already puzzling, and Mr Trump's stance marks a further policy lapse.

POLICY IMPLICATIONS

Cracking down aggressively on plastic use is a tempting option, but draconian interventions can be counterproductive and risk ignoring broader development needs as well.

For example, Kenya's ban denies poor Nairobi residents the option of using plastic bags as "flying toilets", in the absence of adequate public facilities.

Policy initiatives are no substitute for lax governance and outdated infrastructure.

In the 23 US national parks that had banned bottled water, refilling stations had already been built. This is an example of practical sequencing in policy.

Kenya must first improve infrastructure, lest it further marginalise vulnerable populations through its impulsive policies on plastic.

Immediate and all-encompassing bans are also difficult to enforce, and may therefore lose credibility and effectiveness. For example, 15 years after Bangladesh initiated a ban on plastic bags, storm drains in the capital Dhaka are still clogged by plastic.

Also, spot-level policies may score political points and grab headlines, but treat only the symptoms of what are systemic problems rooted in a ravenously profit-hungry industrial-political complex.

Plastic bags and bottles have been an obvious menace for decades, but the emergence of microplastics will test the policy capacity of governments in various new ways.

Adopting elevated standards for water quality, improving treatment technologies and modernising supply systems can help manage the crisis of water-borne microplastics and other emerging pathologies.

Supply-side controls are also necessary; one example is Britain's proposed ban on microbeads used in cosmetics and toothpaste.

There is no longer a "great future" in plastics, least of all a sustainable one. A holistic global initiative is needed.

The United Nations has launched a #CleanSeas campaign for eliminating microplastics in cosmetics and single-use plastic bags by 2022. It is time for the World Health Organisation to introduce universal benchmarks for microplastic content in water, similar to those for lead.

This would enable water quality benchmarking across countries, a crucial early step in prompting a global discussion similar to that for other pollutants.

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