ESTUARIES AND RIVER MOUTHS

New report seeks solutions for Durban Bay plastic pollution problem

Durban's once pristine Bay is awash with plastic. A new Water Research Commission (WRC) report looks at what can be done to stem the wasteful tide… with lessons that should have wider application. Matthew Hattingh reports.

From the accounts of early visitors and settlers, it must have been a natural paradise.

In ***The History of old Durban and Reminiscences of an Emigrant of 1850***, George Russell writes of the Bay: "A large area between the town and the [Salisbury] island was covered with a grass-like seaweed, which… formed the happy hunting ground of various queer fishes as diverse, if not so melodious, as the imps who troubled St Anthony, skate, cuttlefish, small sand-shark, and even the turtle being plentiful. Seaweed washed up in heaps on the Bay foreshore, and the primitive [settler's] wife adopted it for mattress making until she found that no amount of fresh water would remove the ingrained salt."

Melodious imps and salty mattresses… Victorian chroniclers could be delightfully florid. Accounts today deploy more technical terms like "biodiversity" and "ecosystem services". No doubt the Bay is much changed from what Russell recalled. Indeed, a 2009 study of estuaries within the municipality of eThekwini (the name derives from ***itheku***, Zulu for bay or lagoon) rated the health of the Bay system as "highly degraded".

The country's extraordinary economic expansion, particularly after the discovery of diamonds and gold in the latter half of the nineteenth century, stoked the development of Durban harbour infrastructure: dredging shipping channels; draining wetlands; building piers and wharves; and canalising the Bay's principal rivers. The last seagrasses disappeared in the mid-1960s along

with most of the mangroves. By 2009, only about 15 ha, or about 3%, of the original mangroves remained.

The destruction and development impeded the natural circulation of water, causing polluted water entering the Bay to accumulate. The 2009 study focuses on chemical and wastewater pollution, but does mention the litter pouring into the Bay from the Umbilo, Umhlatuzana and Amanzimnyama rivers and from 50 stormwater drains.

A new report, ***Transforming the future of Durban Bay: Strengthening socio-ecological resilience*** (**WRC Report no. TT 945/24**), which focuses on plastic pollution, reminds us that in 1950 about 2-million tons of plastic pollution were produced worldwide; in recent years the figure reached 450-million tons. Its harmful effects are increasingly well documented and the report, published by the WRC earlier this year, tells how plastic degrades into microplastics and chemicals, in time poisoning water and soil, and threatening the health of humans and animals.

It disrupts natural systems and smothers living creatures. It forms dense mats with other debris, particularly from alien plant species, to block watercourses, causing flooding and damage to property. It's ugly too, discouraging tourism and necessitating beach and harbour cleanups. Storms in 2016, 2018 and 2019 dumped many tons of debris in the Bay, including considerable plastic, disrupting harbour operations and costing millions to clear — more than R5.6-million in 2019 alone.

Less well studied, said the report, were the "plastic pathways" connecting land and sea, and the causes of plastic pollution and its effects on society and ecosystems. Aiming to bridge this gap, the report draws on the work of authors Kendyl Wright, Sibusiso Mkhabela, Michelle Fourie, Catherine Sutherland, Nadia Sitas, Maike Hamann, Odirilwe Selomane, Wendy Dunn and Lindani Mtshali. The cross-disciplinary team represents Wildtrust (Wildoceans programme); uBoomi; the University of KwaZulu-Natal; Stellenbosch University; the Climate and Development Knowledge Network; the University of Exeter; and the University of Pretoria.

They noted a decline in water quality in the Bay and that more than 90% of its estuarine habitats have been lost. They hoped a deeper understanding of plastic pollution in the Bay's river catchments would help devise and apply policies and action

Mnqobi Zuma

A Blue Port team separates waste into different categories.

Kendyl Wright

Report co-author and Wildtrust research assistant Sibusiso Mkhabela beneath a canopy of mangroves in the Bay, inside what resembles a "cathedral of trees". Although degraded, the Bay remains ecologically important.

in the places likely to have the most leverage. Dr Wright, lead author, and a specialist on marine protected areas, said they had also sought to understand the governance, social and economic factors involved in plastic pollution.

Speaking at a report pre-launch in February, she sounded a call to action while offering the audience glimpses of hope. Wright shared a striking photograph of fellow author and Wildtrust colleague, Sibusiso Mkhabela, standing beneath a canopy of mangroves in the Bay, inside what truly resembled a "cathedral of trees". In another photograph, she pointed out textured patterns on a sandbank – evidence of crabs at work – vital creatures nearer the bottom of a food chain that supported fish and birds. Despite its degradation, the Bay remained ecologically important. Its natural systems, including surviving mangroves, offered a bulwark against climate change.

A socio-ecological system model, which revealed how most waste in the Bay has its origins upstream, forms the report's bedrock, tracing the effect of people on the ecology of the Bay and its rivers, and vice versa. It drew on earlier studies of river management and rehabilitation projects in eThekwini, notably of the Umbilo River. We learn how a vicious circle developed: The more rivers became degraded, "due to chronic issues such as aging infrastructure, pollution, a lack of service delivery and waste management systems, poor sanitation… floods and drought", the less people felt a "duty to care".

The river studies shared common threads. Settlements have grown and multiplied and are increasingly dense. The municipality struggled to provide regular services, including domestic solid waste collection. Black bags left at roadsides

for collection were often ripped open by monkeys and other animals; waste-pickers (an important link in the recycling chain) when careless, damaged bags and spilled waste. This, and rubbish dumped in unserviced areas, was frequently washed or blown into rivers. Governance was failing, "with no-one taking responsibility or showing the leadership required to address the problem".

Yet it was neither reasonable nor realistic to expect the municipality to shoulder the burden alone, especially given its limited resources in a fast-growing city where illegal dumping was rife and people careless with their litter. Many of us toss chip packets and cold drink bottles from car and taxi windows thoughtlessly, leaving it to be buffeted along by traffic or wind until it reaches rivers flowing into the Bay.

Notably, most people interviewed for the Umbilo study claimed "plastic came from elsewhere" and that others were to blame for the high levels of plastic pollution. The levers for change in this instance, the authors felt, were education and communication campaigns aimed at "getting everyone… reflecting on their role in producing the waste". People needed to understand how plastic moved through catchments and take responsibility for its disposal and for their choices in buying or consuming plastic.

The report identified around a dozen drivers of plastic waste in catchments, along with levers to initiate corrective change. These included understanding the way plastic becomes hidden in the environment, in bushy riverbanks, only to be released during heavy rains. Fostering citizen awareness, responsibility and ubuntu were suggested levers, with the famed monthly citizen clean-ups practised in Kigali, Rwanda, given as an example worth emulating.

Mnqobi Zuma

A Blue Port waste picker weighs a sack of waste collected in Durban Bay. Tallies are kept of the quanities and types of plastic and other waste collected.

Mnqobi Zuma

Plastic, glass and other waste collected in the Bay.

To firm up initial findings and recommendations, the views of individuals and institutions with a stake in the state of the Bay were canvassed through an online workshop. Meanwhile, an ecological study helped the authors broaden their understanding of the problem beyond the anecdotal. From September 2023 to February 2024, a Wildtrust Blue Port project team completed a standing stock survey of litter accumulated in different Bay habitats. Of the 5.6-tons collected and sorted, 90% was plastic, including buckets, containers, tubs, disposable nappies, straws, cups, and variously sized fragments. Of this, macro-plastic pollution, single-use bags and chip and biscuit packets were the most commonplace.

"Further analysis of sufficiently intact plastic items identified… nine parent companies that were the main contributors to plastic waste in Durban Bay: Simba, Frimax, Imbazo Foods, Coca-Cola, Mondelez International Inc, Truda, Unilever, Tiger Brands, and Sun Foods." Truda and Frimax topped the list. The survey and analysis underscored the dominance of plastic pollution and the complexity of its pathways, said the authors. They called for comprehensive waste management strategies to address the sources and movement of plastic pollution, identifying three main themes.

The value of plastic is one theme. We use so much of it partly because it's so cheap. Thus, it's easy to toss after use and therefore more convenient. But this cheap plastic, especially the single-use stuff used in packaging, isn't particularly valuable to recyclers. The Blue Port initiative, established in 2015 to help rejuvenate the Bay and whose clean-up crew did the grunt work for the stock survey, was busy when your correspondent joined them at the Durban Yacht Mole on 18 March.

We clambered down the rocks that form a breakwater around the mole, collecting plastic and other waste — some recyclable, some destined for the landfill. Concentrating on one sort of waste at a time to save on sorting later, we easily filled our sacks. Styrofoam punnets and fast-food boxes might make up one load, followed by a sack of high-density polyethylene and polypropylene – bottle caps, sealing rings, and a surprising number of snuff tubs and Aromat containers.

The storms that lashed Durban from 19 February to 15 March, claiming six lives, brought a deluge of debris into the Bay. Spill Tech, a private contractor, had been at it for weeks clearing the bigger stuff, including lots of vegetation, with heavy equipment. But there seemed no end to smaller plastic rubbish, among rocks or half buried in the sand below the mole.

Tea break brought a pause to the back-testing tedium. Sitting on the rocks looking across the sandbanks towards Bayhead, I chatted to a few of the crew. Nobuhle Luthuli, 21, told me she has a child and was the sole breadwinner at her Umlazi home. The Blue Port crew of 44 mostly women, received R4700 monthly, thanks to support from the Youth Employment Services programme and sponsors like Nedbank. Luthuli wasn't sure what she would do for a living once her one-year contract ends. The job was OK, she said, but the crew was sometimes underappreciated by the public, who seemed only to see what hadn't been collected: "Lots of people say we are not doing anything."

Nearby, traffic roared beneath the tall palms on Margaret Mncadi Avenue, the historic Esplanade skirting the Bay's northern shore that still wears a certain gritty charm. Waterbirds flew overhead while house crows pecked at the contents of a takeaway box exposed by the tide.

The other two big themes flagged by the report were political will, and human-nature values.

The authors felt short-term, election-driven goals and the many pressing problems like poverty and unemployment sapped political leaders of the will to tackle pollution. This delayed or rendered action ineffective, corroding public trust. Corruption and governance snafus worsened matters.

Human-nature values concerned the disconnection many feel to the natural world, leading to apathy, and a belief that "the environment offers a seemingly unlimited waste removal service". People often believed waste management was the responsibility of the government. Meanwhile businesses folded their hands in the absence of "real consequences for the continued production and use of plastic". The authors felt support must continue for voluntary cleanups and the ongoing cleanup and waste-trap work of initiatives like the Blue Port. But in the long-term, more sectors must be roped in to tackle the pollution blight, especially businesses who profit from single-use plastic.

Carrots must be dangled and sticks wielded to promote deposit-return schemes and to require producers to set collection and recycling targets in line with new regulations. And policies were needed to "phase out or tax single-use plastics, including plastic bags, chip packets, straws and polystyrene containers". Better municipal waste collection, particularly in poorly serviced areas, and collaboration between the government, businesses and NGOs, were essential and this must be bolstered by dialogue, education and awareness campaigns.

"Ultimately, addressing plastic pollution in Durban Bay is not just about cleaning up the waste that currently exists but about transforming the underlying systems that drive plastic production consumption and disposal," the report said.

St Anthony, mentioned earlier in Russell's rhapsody on a once unsullied body of water, is revered as the patron saint of lost things, and invoked for the return of items, people… even spiritual goods. Time, perhaps, for a quiet word about our Bay.

Lethu Ngubane

Waste is recorded by category during work on the Durban Bay Yacht Mole.