



Centre for Environment  
Fisheries & Aquaculture  
Science



# South African Summary Report

Commonwealth Litter Programme



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# 1 Background

The Commonwealth Litter Programme (CLiP) was run by the Centre for Environment, Fisheries and Aquaculture Science (Cefas), funded by United Kingdom's Department for Environment, Food and Rural Affairs (Defra). This programme involved Cefas working with partners across the Commonwealth to share expertise and find solutions to the environmental and socio-economic problems caused by litter in the marine environment. The aims of this collaborative project was to support actions to reduce the amount of litter entering the marine environment, contributing towards making our oceans cleaner, healthier and more sustainable. South Africa was the fourth country making up CLiP, which also included Solomon Islands, Vanuatu, Belize, South Africa and India.

The overall aims of CLiP were:

- Prevent and reduce marine litter and its impact on marine organisms, habitats and humans
- Reduce the knock-on impact of marine litter on economies and communities, including vital industries, such as tourism and fisheries
- Remove litter from the terrestrial and marine environment where practical
- Data collection to understand marine litter distribution and impacts
- Partner with Commonwealth countries in the development, implementation and coordination of programmes for marine litter reduction

These aims were covered under the following five pillars:

- Actions to combat land-based sources of litter
- Actions to combat sea-based sources of litter
- Removal from environment
- Science
- Education and Outreach

The high-level outcomes of CLiP were as follows:

- A country-specific set of internationally recognised options for tackling marine litter
- Resources to be available for all to use
- Best practise forum available to facilitate co-operation
- Reports and research publications to inform decision making
- Increased stakeholder awareness of issues and options available to make changes

And the main objectives were:

- Support Commonwealth countries in the development, implementation and coordination of their programmes for marine litter reduction
- Develop management approaches to marine litter pollution that are consistent with recognised international approaches

- Prevent and reduce marine litter and its impact on marine organisms, habitats, public health and safety and reduce the socio-economic costs it causes
- Remove litter from the marine environment where practical and feasible
- Enhance knowledge and awareness on marine litter pollution

All reports for the South African phase of CLiP can be found on the following webpage:

<https://www.cefas.co.uk/clip/resources/reports/africa-clip-reports/>

## 2 Overview of activities in South Africa

### 2.1 Land-based sources of litter

#### 2.1.1 Household waste classification study

Asia Pacific Waste Consultants (APWC) conducted two waste classification studies in eThekweni Metropolitan Municipality and the City of Cape Town Metropolitan Municipality. Initial results showed that under-pricing of waste management is a key driver in waste behaviour and waste management practices on all levels (household, government, industry), resulting in low levels of waste separation at source. Collaboration between all sectors (household, producers) is required to improve recycling rates and decrease contamination in the waste stream. Despite strong legislation, enforcement capabilities on all levels are low, with significant system constraints to service delivery, lack of finance for infrastructure and operations. Furthermore, there are significant differences of waste services delivered between provinces, municipalities, rural and urban areas and socio-economic groups.

Report: APWC (Asia Pacific Waste Consultants), 2020. Waste classification report. The Commonwealth Litter Programme, South Africa.

Data digital object identifier (DOI) will be available at a future date through: <https://www.cefas.co.uk/data-and-publications/doi/>

#### 2.1.2 Socio-economics choice experiment

A socio-economic study choice experiment was conducted to explore individual preferences and attitudes towards food packaging, including sustainability of materials, reduction, reuse, and recycling habits. The study targeted Cape Town residents to investigate their preferences and willingness to pay towards food packaging characteristics such as material used, disposal method, possibility to reuse the packaging, the level of food protection.

Report: Under preparation and peer review publication.

Data DOI will be available at a future date through: <https://www.cefas.co.uk/data-and-publications/doi/>

## 2.2 Sea-based sources of litter

### 2.2.1 Port reception audit

A Port Reception Audit was conducted by APWC, covering eight international ports and six domestic ports in South Africa. This Audit looked at the ports in relation to their ability to handle waste from ships according to international standards and requirements.

Report: APWC (Asia Pacific Waste Consultants), 2020. Port Reception Waste Facilities Audit. The Commonwealth Litter Programme, South Africa.

Data DOI will be available at a future date through: <https://www.cefas.co.uk/data-and-publications/doi/>

### 2.2.2 Desktop study on fisheries in South Africa from a marine litter perspective

A literature study was performed by Cefas to examine the fisheries sectors of South Africa in relation to marine litter, specifically the likelihood for litter from fishing to become Abandoned, Lost and Discarded Fishing Gear (ALDFG) with the potential to ghost fish.

The study covered the major fisheries sectors of South Africa describing bottom and midwater trawling, both demersal and pelagic long-lining, pole fishing for tuna, traditional line fishing, trap and pot fishing, seining and fishing with gillnets, and defined ALDFG, the potential impacts of ALDFG and the reasons for ALDFG, and methods for reducing ALDFG, from a global perspective.

There is some inevitable minor gear loss in South Africa, and most lost gear does not remain active for long. The expense of fishing gear encourages owners to attempt retrieval. Plus, any significant gear loss must be reported to the Department of Agriculture, Forestry and Fisheries (DAFF) as a condition of the permit to fish. There is some degree of voluntary gear marking, but gear marking is not a requirement of the fishing permit in most South African fisheries. Currently, there is some education and awareness on ALDFG present in the industry.

Recommendations to improve tackling ALDFG in South Africa were proposed; making gear marking a requirement of the permit to fish would assist in the identification of Illegal, Unregulated and Unreported (IUU) fishing gear, (IUU is a particular problem in South African waters); modifying port state measures to include the inspection of fishing gear to aid identification of IUU; provision of appropriate low cost collection facilities for unwanted fishing gear to discourage discarding unwanted gear at sea, encourage owners/operators of fishing gear to make every reasonable effort to retrieve ALDFG and finally encourage the use of appropriate biodegradable material, escape mechanisms, or passive deterrents to reduce the time that lost fishing gear remains active.

Report: Cefas (Centre for Environment, Fisheries and Aquaculture Science), 2020. South African Marine Fisheries and Abandoned, Lost and Discarded Fishing Gear, Commonwealth Litter Programme, South Africa. Author: Randall, P.

### 2.2.3 Fisheries training course

CLiP supported the development of a fisheries training courses, in partnership with World Wildlife Fund for Nature (WWF). The training courses are aimed at reducing marine litter from the fishing industry in South Africa by raising awareness, building local capacity and providing economic and practical solutions that provide long-term impact in reducing marine litter arising from the fishing industry. The modules, as well as the monitoring and evaluation framework, will be fully incorporated in the Responsible Fisheries Alliance, small-scale training programmes and the WWF-SASSI training at WWF-SA.

Report: WWF (World Wide Fund for Nature), 2020. Reducing marine litter arising from the fishing industry in South Africa. The Commonwealth Litter Programme, South Africa.

## 2.3 Removal of litter from the environment

### 2.3.1 Pilot study

A community outreach and removal/reduction pilot study was implemented by Green Corridor. This study focussed on two informal communities in eThekweni, which do not receive regular formal waste collection. These communities have different geographic barriers, different socio-economic situations, as well as different governance structures. They are both good reflections of other communities across South Africa. Both settlements are situated alongside tributaries of the uMngeni River, which is a major source of marine plastic pollution in the region. These pilot studies, based in Quarry Road West and the KwaShemba area, are community-based studies, looking for community-based solutions, which the communities identify and co-create as part of CLiP. The information from the Household Waste Classification Study (Section 2.1.1) and associated household level surveys were used to develop the pilot studies.

Report: Green Corridors, 2020. Pilot waste removal and outreach study in Durban, South Africa - Quarry Road West and KwaShembe (Clermont) report. The Commonwealth Litter Programme, South Africa.

## 2.4 Science

### 2.4.1 Marine plastic litter workshop

Cefas, the Council for Scientific and Industrial Research (CSIR) and Department for Science and Innovation (DSI) co-delivered a Marine Plastic Litter Workshop in Cape Town on 1<sup>st</sup> – 3<sup>rd</sup> October 2019. 37 Delegates, from 15 organisations attended, including universities, governmental departments, Non-Government Organisations (NGOs) and the private sector. Three presentations introduced the work by Cefas to study marine litter, a summary of the gaps in scientific knowledge and the current legislative framework for the waste management and environmental protection in South Africa.

Useful conversations were held in relation to the need for more enforcement of litter legislation and responsible ownership of litter in the freshwater system, and the need to promote best practices, particularly to ensure that communications occurred at community, industry and

governmental level and that more effort is needed to transform awareness in practical behavioural change. The group also discussed the importance of data to understand the plastic flows in the country (import volumes, commercial data) and possible way of collecting marine litter data expanding monitoring programmes that already exist.

The afternoon was dedicated to discussing micro- and macroplastics monitoring strategies. In a plenary session, the strategies adopted at the international and regional level to coordinate and standardise monitoring strategies were presented. New studies carried out nationally and the approach followed by NGOs involved in citizen science were also showcased.

Report: Cefas (Centre for Environment, Fisheries & Aquaculture Science), 2020. CSIR – DSI – Cefas Marine plastic litter workshop Day 2 – Report, Commonwealth Litter Programme South Africa. Author: Umberto Binetti.

## 2.4.2 Microplastics

### 2.4.2.1 *Biota*

In collaboration with Department of Agriculture, Fisheries and Aquaculture Science (DAFF), CLiP conducted a baseline study of microplastics in economically important species of marine and estuarine fish in South Africa. Samples were collected by The Aquaculture and Fisheries Division of DEFF during their surveys throughout 2019.

Report link: Under preparation and peer review publication

Data DOI will be available at a future date through: <https://www.cefas.co.uk/data-and-publications/does/>

### 2.4.2.2 *Port of Durban study*

At the request of the Department of Environmental Affairs (DEA), a micro plastic study of the Port of Durban was conducted. The uMhlatuzana, uMbilo and uManzimnyama river catchments all flow into the Port of Durban, as well as ten storm water drains. There is active discharge of harbour sediment into Durban Bay to prevent sediment build-up in the port's channels. This leads to the hypothesis that the Port of Durban may act as a pathway for the transfer of marine litter and microplastics from land to sea. Surface water samples were collected from seven locations around the Port of Durban using a microplastic pump, which filtered 2000 litres through four different sieve sizes, to identify the quantity and size distribution of microplastics present in the bay. Sediment samples were also collected from 25 locations within the harbour, and one outside, for microplastic and particle size analysis. Accompanying surficial water temperature, salinity, turbidity and dissolved oxygen data were collected at each station using a hand-held CTD.

Report link: Under preparation and peer review publication

Data DOI will be available at a future date through: <https://www.cefas.co.uk/data-and-publications/does/>



### 2.4.3 Macro litter

#### 2.4.3.1 *Standing stock and daily accumulation study*

Macro litter surveys showing categorisation of marine litter in KwaZulu-Natal were conducted in collaboration with the University of KwaZulu-Natal (UKZN) over 11 days at two locations approximately 20km from Durban City. Two additional Standing stock surveys were done previous to this daily accumulation day study. Preliminary analysis shows marine litter dominated by plastic, which constitute more than 90% of all items found during the clean-ups. The majority of items were small pieces of plastic, too small to be recognised. The rest of the litter mostly consisted of cigarette butts (paper) and cotton buds (sanitary waste).

Report link: Under preparation and peer review publication

Data DOI: <https://www.cefas.co.uk/data-and-publications/does/clip-south-africa-marine-litter-accumulation-study-cefas-ukzn-2019/>

### 2.4.4 Research resource development

#### 2.4.4.1 *Micro Plastic laboratories*

Two microplastic analysis laboratories were established in South Africa. The first, in Cape Town, with the Department of Environment, Fisheries and Aquaculture Science (DEFF) was the core base for the South African CLiP team. This will be moved to slightly bigger premises within the Foretrust Building – once these premises are ready. A second laboratory was set up with South Africa Environmental Observation Network (SAEON) in Port Elizabeth.

Training was delivered to both DEFF and SAEON staff. Training courses were key in ensuring knowledge transfer and to enable collaborative strategies for the long-term production of monitoring data on the occurrence and abundance of microplastics in environmental samples including biota, sediment and water samples.

Both laboratories were created to investigate the occurrence and abundance of microplastics in environmental samples for selected sites in South Africa. The laboratories consist of key equipment to allow for the extraction, isolation and identification of plastic items in samples as well as the sharing and optimisation of a series of Standard Operating Procedures (SOPs), developed at Cefas, according to local specific needs and challenges.

Report: Cefas (Centre for Environment, Fisheries and Aquaculture Science), 2020. South African Training Report, Commonwealth Litter Programme, South Africa.

#### 2.4.4.2 *Capacity building*

Training for macro litter was delivered by Cefas scientists to staff and students from UKZN, producing a strong scientific one-off study under CLiP, while equipping the university with the knowledge, skills and equipment to run a similar study in the future.

Report: Cefas (Centre for Environment, Fisheries and Aquaculture Science), 2020. South African Training Report, Commonwealth Litter Programme, South Africa.

## 2.5 Education and outreach

### 2.5.1 Marine week display

To support further public engagement with the objectives of the CLiP project an outreach activity was prepared for uShaka Marine World delivered by the South African Association for Marine Biological Research (SAAMBR), on behalf of CLiP. The exhibit, constructed and erected in the entrance arena of uShaka Marine World, Durban, was manned by qualified and experienced staff members for nine days during Marine Week 2019, 5<sup>th</sup> – 13<sup>th</sup> October. Over 2,000 visitors entered the exhibit, where they were given a guided tour lasting between 5 and 60 minutes. The key messages of the display were illustrated through life size models of a turtle, a penguin and a seal, impacted by marine litter, and that our everyday choices can help or harm marine life illustrated through a bathroom and kitchen, with appropriate interpretive signage. Many visitor families made collective promises on recycling (36%), using alternative products (27%) and not littering (24%). Those who submitted promises and included an email address will be contacted to determine if making the promise has had any lasting impact on behaviour.

Report: SAAMBR (South African Association for Marine Biological Research), 2020. Marine Litter Exhibit for Marine Week 2019, Commonwealth Litter Programme South Africa.

### 2.5.2 Education workshop

Towards the end of the deployment in South Africa, an Education Workshop was conducted in partnership with Sustainable Seas Trust (SST) in Port Elizabeth. SST invited educators and specialists from seven African and Indian Ocean Countries (South Africa, Mozambique, Tanzania, Kenya, Seychelles, Madagascar and Mauritius) to discuss strengthening the network of teachers and educators as required by the African Marine Waste Network (AMWN). The outcome of the workshop was a plan for an effective educational programme that can be rolled out by different organisations to work towards Zero Plastics to the Seas of Africa.

Report: SST (Sustainable Seas Trust), 2020. Education Workshop Report. The Commonwealth Litter Programme, South Africa and the Norwegian Embassy.

### 2.5.3 Innovation Conference: STEM the tide of plastic waste in Africa

Results of local activities from the CLiP project were presented at the Innovation Conference: STEM the tide of plastic waste in Africa, in Cape Town on 5<sup>th</sup> – 6<sup>th</sup> of December. This conference was delivered in partnership with Sustainable Seas Trust (SST), in preparation for the African Marine Waste Network's conference on marine litter in April 2020 (postponed due to coronavirus). The focus of this conference was using innovative solutions focussed around the STEM concepts (Science, Technology, Engineering and Mathematics) to tackle marine litter in the region. The interactive two-day programme showcased the entries to the STOMP awards (<https://stompawards.co.za/>) (Section 2.5.4), with the winner announced by the British Consult

on the second day of the conference. Full agenda, and link to the conference webpage can be found here: <https://clip.sst.org.za/>

Report: SST (Sustainable Seas Trust), 2020. CLiP Innovation Conference: STEM the tide of plastic waste in Africa. The Commonwealth Litter Programme, South Africa.

#### 2.5.4 STOMP awards

The STOMP awards (STamp Out Marine Pollution), organised by Green Corridors (<https://stompawards.co.za/>), was launched in October 2019, designed to recognise and reward individuals, civil society organisations, interest groups and youth that are taking action and making an impact on the reduction of marine plastic pollution in South Africa. The STOMP awards recognised innovation and creativity across a range of categories, from design and technology to consumer products to creative arts, all underpinned by a common message of stopping marine plastic pollution and encouraging circular economy thinking.

Report: Green Corridors, 2020. STEM Contest: The STOMP Awards – STamp Out Marine Pollution) report. The Commonwealth Litter Programme, South Africa.

#### 2.5.5 Communications and outreach

##### 2.5.5.1 *African Waste Academy Webinar*

As part of the African Waste Academy's webinar 3<sup>rd</sup> series Cefas delivered a webinar entitled "Data, in support of institutional and individual behaviour change regarding marine litter", on the 25<sup>th</sup> June 2019 to attendees. This webinar was recorded and made publicly available through the following link: <https://www.youtube.com/watch?v=pojU5yA9PvY>

Report: Cefas (Centre for Environment, Fisheries and Aquaculture Science), 2020. South African Communications and Outreach Report, Commonwealth Litter Programme, South Africa.

##### 2.5.5.2 *VIP visit - Beach outreach with a mobile laboratory*

On the 24<sup>th</sup> September 2019, the Duke and Duchess of Sussex were hosted in a demonstration of the CLiP laboratory on Monwabisi Beach. This event was developed in partnership with Waves for Change and Sea Change. The partnership was organised by the British High Commission and included a VIP visit by the Duke and Duchess of Sussex (Prince Harry and Megan Markle), with a follow up reception at the Commissioner's house in Newlands. The visit provided further media reach for CLiP in South Africa and the United Kingdom, as well as important introductions to further marine based NGO's in South Africa, the connections of which have been utilised for the STEM conference.

Report: Cefas (Centre for Environment, Fisheries and Aquaculture Science), 2020. South African Communications and Outreach Report, Commonwealth Litter Programme, South Africa.

#### 2.5.5.3 *Independent Education Board conference*

In partnership with SST, CLiP prepared a keynote lecture on marine litter for the Independent Education Board (IEB) Life Science Matric teacher conference. This was organised by CLiP, presented by Nozi Mbongwa and Toshka Barnardo of SST. The lecture split the time between SST and CLiP's scientific data and education effort used to combat marine plastics in South Africa, and regionally. The delivery was attended by about 315 South African Matric Life Science educators.

Report: Cefas (Centre for Environment, Fisheries and Aquaculture Science), 2020. South African Communications and Outreach Report, Commonwealth Litter Programme, South Africa.

#### 2.5.5.4 *Public communications*

CLiP also worked with local partners to generate coverage of marine litter issues on mass and social media. Contact was made with newspapers and radio and television channels to get articles and news items covering key moments such as the launch of the project in country, contest and conference.

Online activities were focussed on Facebook as that platform has the highest levels of use among South Africa's population. Posts were designed to make issues relevant to communities and demonstrate direct engagement of the team with both the government and local society. A key component in this was interaction with stakeholders through the Facebook platform. Social media activities were supported by the Cefas CLiP website which acts as a repository for outreach materials and news.

Report: Cefas (Centre for Environment, Fisheries and Aquaculture Science), 2020. South African Communications and Outreach Report, Commonwealth Litter Programme, South Africa.

#### 2.5.5.5 *Wavescape*

CLiP supported for the Wavescape Surf and Ocean Festival and associated publicity in raising awareness of the programme and marine litter issues.

Report: Cefas (Centre for Environment, Fisheries and Aquaculture Science), 2020. South African Communications and Outreach Report, Commonwealth Litter Programme, South Africa.

## 2.6 Policy support – Plastic Colloquium

The DEA hosted a Plastic Colloquium on the 21st and 22nd November 2019. CLiP provided the support necessary for CSIR to write up the second day of the Plastic Colloquium into a report capturing the discussions. The expo, hosted on the first day of the Colloquium, was utilised to show the CLiP work within South Africa.

Report: Plastics Colloquium Report



# Centre for Environment Fisheries & Aquaculture Science



## About us

We are the Government's marine and freshwater science experts. We help keep our seas, oceans and rivers healthy and productive and our seafood safe and sustainable by providing data and advice to the UK Government and our overseas partners.

We are passionate about what we do because our work helps tackle the serious global problems of climate change, marine litter, over-fishing and pollution in support of the UK's commitments to a better future (for example the UN Sustainable Development Goals and Defra's 25 year Environment Plan).

We work in partnership with our colleagues in Defra and across UK government, and with international governments, business, maritime and fishing industry, non-governmental organisations, research institutes, universities, civil society and schools to collate and share knowledge.

Together we can understand and value our seas to secure a sustainable blue future for us all, and help create a greater place for living.

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Innovative, world-class science is central to our mission. Our scientists use a breadth of surveying, mapping and sampling technologies to collect and analyse data that are reliable and valuable. We use our state-of-the-art Research Vessel Cefas Endeavour, autonomous marine vehicles, remotely piloted aircraft and utilise satellites to monitor and assess the health of our waters.

In our laboratories in Lowestoft and Weymouth we:

- safeguard human and animal health
- enable food security
- support marine economies.

This is supported by monitoring risks and disease in water and seafood; using our data in advanced computer models to advise on how best to manage fish stocks and seafood farming; to reduce the environmental impact of man-made developments; and to respond to serious emergencies such as fish disease outbreaks, and to respond to oil or chemical spills, and radioactivity leaks.

Overseas, our scientists currently work in Commonwealth countries, United Kingdom Overseas Territories, South East Asia and the Middle East.

Our customer base and partnerships are broad, spanning Government, public and private sectors, academia, non-governmental organisations (NGOs), at home and internationally.



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