



Centre for Environment  
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**Cefas**



# Commonwealth Litter Programme - Belize

## Outreach and Best Practices Report

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## Executive Summary

This report documents activities of the Commonwealth Litter Programme (CLiP) in Belize in the spring and summer of 2019. It focuses on outreach activities and a review of some Belize's key best practices in the reduction of land-based sources of marine litter, highlighting how they could be developed further.

The research was conducted through desktop studies, workshops and face-to-face meetings with the Belizean government, businesses and NGOs. Based on these discussions, outreach materials were adapted to suit Belizean requirements, with new materials created to tackle priority topics, such as the burning of plastic waste and use of single-use shopping bags. Workshops were organised to engage the tourism and hospitality sector to identify current sustainable practices that could be scaled up and to identify new opportunities. The CLiP team attended the annual Tourism Symposium and hosted a stand at a major annual festival to engage with stakeholders and the general public on their views of marine litter and options for solutions. CLiP coordinated with and added to existing activities by organising their own events such as a community beach cleans and community talks at churches to engage with local communities. These were coordinating with existing activities and events as much as possible to minimise disruption and add value.

Besides personal outreach, CLiP also invested in exposure on key mass and social media platforms. Contact was made with key mass media outlets including newspaper, radio and television channels who covered CLiP on items such as CLiP's launch, workshops, the national marine litter competition and launch of the Marine Litter Action Plan. Overall, at least 31 pieces were published in the media on CLiP's Belize deployment.

Online activities were focused on Facebook as this is the platform with the highest levels of use among Belize'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 acted as a repository for outreach materials and news. These activities were also coordinated with Belize Department for the Environment's Outreach team and the Government Press Office.

The investigation of best practices was primarily focused on land-based initiatives. The CLiP team engaged with key stakeholders that deliver best practice in waste management. For example, the Chaa Creek Resort and their composting facility; and Resource Recycling Recovery, which specialises in processing plastic bottles for export and recycling. Bowen and Bowen also provided an example of a deposit-return scheme, the only one active in Belize at the time of writing. The Belize Solid Waste Management Authority was actively consulted to understand their strategy to enhance waste management on a national scale.

To coordinate discussions between key stakeholders, CLiP hosted a best practice workshop with attendees representing a wide range of stakeholders including government, businesses and NGOs. Local and international best practices were presented, discussed and ranked to identify

priorities and ways to scale them up. The top categories of best practices identified were education, anti-litter legislation, incentivising reuse of products, placement of refill stations and further developing deposit schemes.

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# 1 Outreach

## 1.1 Introduction and approach

Outreach to stakeholders including business, NGOs, government and importantly local communities play a vital role in the reduction of marine litter. This is because advances in scientific understanding and subsequent policy changes will only result in positive changes if the behaviours of the population also change (Veríssimo, 2013). It has been demonstrated that outreach campaigns have a greater effect on reducing plastic pollution than improvements to waste facilities (Willis et al., 2018). A successful outreach campaign for marine litter provides information on the problems marine litter poses to humans and the environment, identifies solutions and empowers individuals and communities to work towards these solutions (Hartley et al., 2015).

Belize is increasingly online and connected, with internet usage as high as 60% of the population<sup>1</sup>. Facebook is the most commonly used social media platform with 57.9% of the population reported to be active monthly users, followed by Instagram (with 16.4% of Belizeans active monthly<sup>1</sup>). Twitter is used by 4.9% of the population in Belize, but could also provide a useful social media platform for communicating project outcomes within the wider global scientific community (Collins et al., 2016).

Beyond social and mass media, face-to-face meetings and workshops are a very powerful way to share information (Egan, 2017). Dialogues can be targeted to different audiences and images and videos can be used as powerful visual aids.

During CLiP deployment in Belize, the outreach materials and their dissemination to communities and stakeholders were tailored to the country. It is important to understand local attitudes to encourage community knowledge and participation (Wiener et al., 2016). Face-to-face meetings with various government officials and representatives of businesses, NGOs and community groups were crucial in understanding the issues specific to Belize and the outreach materials and activities were tailored according to the feedback and suggestions received. The CLiP outreach and education team also worked closely with stakeholders to organise and take part in various workshops and events throughout CLiP's duration in Belize, to maximise the outreach to individuals and communities. Social media (especially Facebook, due to its high rate of usage in Belize) was used throughout the CLiP programme to reach local communities and widen the impact of CLiP in Belize. Traditional media such as TV, radio and newsprint were also utilised to raise awareness of the CLiP programme and marine litter. CLiP also worked with the Department for the Environment and Government Media Team to identify key social and mass media outlets to target specific audiences and thereby ensure penetration of messages into key audiences.

The CLiP outreach and education team started one-to-one engagement with various stakeholders, from government officials to the representatives of private businesses, NGOs and

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<sup>1</sup> DataRePortal; accessed 28/11/19

community groups soon after arriving in country. The dialogue was kept going throughout CLiP presence in country and has continued following this engagement. The initial communication usually involved an introductory email or a phone call followed by face-to-face meetings where CLiP objectives and aims were outlined. Their alignment and added value to stakeholder interests and agenda were also discussed. Based on early conversations, the outreach materials and activities were tailored to focus on the specific needs and issues for Belize as highlighted by the stakeholders.

Workshops were targeted to different stakeholders so that the messages could be kept focused and specific. Developing The Community Education Packs, available at: <https://www.cefas.co.uk/clip/resources/community-packs/>, also included reaching out to government departments, the tourism industry and NGOs. The stakeholders identified to be targeted by CLiP outreach were:

- Hotels/ Tourism
- Other businesses
- Communities
- Government
- General public

## 1.2 Face-to-face meetings

The CLiP outreach and education team started reaching out to the government departments, businesses, NGOs and community groups that were identified as relevant stakeholders soon after arriving in country. The team held face-to-face meetings with officials from government departments including the Department of the Environment (DOE), Coastal Zone Management Authority and Institute (CZMAI), and Belize Solid Waste Management Authority (BSWaMA). The team also organised meetings with private businesses such as Resource Recovery Recycling Belize (RRR), Chaa Creek Resort, the Hotel Association, Belize Tourism and Industry Association (BTIA), and Brodie's supermarket. The community groups that CLiP engaged with included the Rotary Club, the Belize Scouts Association, Belize Audubon Society and various community members from San Pedro who are actively trying to tackle issues related to waste management and littering. Further discussions were held with NGOs such as OCEANA and TIDE.

The face-to-face meetings were crucial to develop further collaboration and identify major issues in waste management practices and behaviours that CLiP outreach team should focus on. Figure 1.1 shows examples of CLiP outreach products that resulted from feedback in face-to-face meetings and direct engagement with stakeholders, available at: <https://www.cefas.co.uk/clip/resources/infographics-and-posters/>.





Figure 1.1. a.) Infographic produced by the CLiP outreach and education team after burning plastic was identified as a key issue for the DOE to tackle on World Earth Day 2019. The infographic was posted on social media, reaching 21,000 people just on the CLiP Facebook page and being shared 67 times on other organisation and individual's pages. b.) Poster produced by the CLiP outreach and education team after reaching out to the Brodie's supermarket to raise awareness on issues related to single-use plastic bags.

### 1.3 In country workshops and events

While in Belize, the CLiP outreach and education team held and/or participated in various workshops and events. The focus was on identifying audiences who would benefit from the CLiP outreach activities. Outputs or messages were developed to reach these target sectors and the most effective ways to distribute these messages was discussed.

#### 1.3.1 Events held to engage with the hotel and tourism sector

The hotel and tourism sector is a significant contributor to waste in Belize with over a million cruise arrivals and close to 500,000 overnight tourist arrivals in 2018 (BTB, 2019) while the population was estimated at close to 400,000<sup>2</sup>. The CLiP outreach and education team held and/or participated in two events that specifically targeted the hotel/ tourism sector:

##### Belize Tourism Industry Association (BTIA) Symposium of Sustainable Tourism on 31 May 2019

BTIA wants to influence cultural change to run businesses more sustainably and is working towards Global Sustainable Tourism Council Criteria, working together with the government. BTIA promotes sustainable tourism in practical solutions and through marketing. The association identified four key components needed for sustainable tourism in Belize:

<sup>2</sup> <http://sib.org.bz/statistics/population/>; accessed 05/12/2019

- Baseline data – where do we stand, per destination/stakeholder
- Implementing sustainable tourism practices
- Encouraging a certification programme – national advice towards international certifications (BTIA are reaching out to try and find discounted rates)
- Marketing and public relations – the importance of sustainable tourism

The CLiP outreach and education team manned a stand at the event, presenting plastic alternatives and top tips for reducing waste in hotels. The event was attended by ca. 50 representatives from various businesses, associations and interested parties in the hotel and tourism sector. The CLiP outreach and education team was approached by ca. 20 attendees (business owners, tour operators) to discuss the plastic alternatives, how their businesses might make changes and the importance of preventing marine litter.

#### Interactive workshop with The Radisson staff on 26 June 2019

Throughout CLiP deployment in Belize, the CLiP outreach and education team regularly engaged with the hotel and sales managers at The Radisson Fort George Hotel and Marina in Belize City to discuss best practices for reducing waste. During these face-to-face meetings, the hotel top tips were presented and discussed to better understand the hotel's practices, what they could feasibly change and any issues they had. The Radisson is making a conscious effort to reduce waste, for example through waste separation in the hotel, providing drinking water refilling stations with their own filtering systems and using refillable containers for condiments in their restaurants. Some of their disposable items are made from biodegradable materials, however composting does not currently take place (although there is desire to do so in the future). Staff are instructed to only provide guests with straws should they ask for them, however this is not always implemented. Additionally, there are some issues with company-wide policies which make it difficult to make further changes in-branch such as refillable toiletries or reusable laundry bags.

As a result of the ongoing dialogue with the hotel management, the CLiP outreach and education team held a workshop with the Radisson staff on the top tips for hotels to reduce litter and how to hold a plastic free event (in preparation of the upcoming CLiP single-use plastic free workshop, other key CLiP workshops and conference). During this session, staff were given opportunity to discuss their ideas for reducing waste and to raise awareness about hotel best practices. The products of this collaboration are shown in Figure 1.2.



Figure 1.2. CLiP outreach and education team products created for the hotel and tourism industry. The top tips were designed in collaboration with The Radisson.

### 1.3.2 Mango Fest

The CLiP outreach and education team set up a stall at Mango Fest in Hopkins, 70 km south of Belie City, held on World Ocean Day, 8 June 2019. The outreach activities organised by the CLiP team included ‘Name the CLiP manatee’ competition (22 entries; the winner “Mango” was announced on the big stage with CLiP getting a specific mention), some activities for young children aimed to introduce the issue of marine litter such as colouring in litter items, bottle cap litter picking competition, beach clean, and bottle cap art. The CLiP stand received a high number of visitors with around a thousand people attending the event (Figure 1.3).



Figure 1.3. CLiP outreach activities at Mango Fest in Hopkins

### 1.3.3 #Trashtag community beach clean, Belizean beach

The CLiP team organised a #trashtag beach clean event on Belizean beach on the southern outskirts of Belize City on 20 June 2019 (Figure 1.4). The event was advertised on Facebook and was attended by ca. 10 children from the local community. The event involved a beach clean and some beach art for the younger children. Further social media posts were made after the event.



Figure 1.4. #trashtag event at Belizean beach.

## 1.4 Media coverage

Traditional media were used by sharing updates with Belize newspapers and television and radio stations with their own audiences to engage with the 40% of the country which are not yet online<sup>3</sup>.

To secure press coverage in this form of media, the CLiP team drafted press releases to share information about CLiP aims and activities to raise awareness of issues and demonstrate that the local communities and governments are engaged to act to reduce marine litter.

### 1.4.1 Newspapers

The primary newspapers CLiP press releases targeted were: The Guardian, Belize Times and the San Pedro Sun. News articles were published on these newspapers' websites, the Gov.UK website and regional Caribbean outlets.

The press releases and associated traditional media coverage were an important part of outreach and were timed to coincide with the start of in country work, beginning of lab training, the contest launch, the national workshop and the conference. Press releases were created in collaboration with local partners and targeted at specific national newspapers and radio stations with detailed programme updates that they could adapt to share with their audiences. Coverage in newspapers and radio engaged local communities on issues related to marine litter,

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<sup>3</sup> DataRePortal; accessed 28/11/19



by providing updates on programme activities and highlighting national government engagement and intention, therefore paving the way for the implementation of action plans.

#### 1.4.2 Television and radio

Initial research and discussions with local partners informed a list of target television and radio stations. The main targets were Great Belize Television (Channel 5) and Channel 7 television stations and Love FM and Krem FM radio stations. Contacts were established with these media organisations via the DOE Outreach team to share news of CLiP with their audiences.

CLiP Senior Marine Advisor Paul Whomersley was interviewed on 6 June 2019 by the radio station LoveFM in Belize City to give an update on CLiP activities and discuss marine litter. This was featured on the 07 of June 2019 news programme (<http://lovefm.com/commonwealth-litter-programme-clip-ready-clean-marine-litter/>).

At the national workshop, reporters from Channel 5 and Channel 7/Love FM attended, filming opening remarks and interviewing the DOE Chief Executive Officer, Her Excellency the British High Commissioner, the Special Representative to the Commonwealth Clean Ocean Alliance (CCOA) and the Cefas CLiP Country Lead (Figure 1.5). A transcript of the Channel 7 piece was made available online (<http://lovefm.com/national-workshop-marine-litter/>).



Figure 1.5 - CLiP country lead Peter Kohler being interviewed by Channel 5 and Channel 7 at the national workshop

The CLiP team produced four press releases on activities in Belize which were taken up in various news outlets in the country and wider Caribbean region. There were at least 31 pieces of coverage in the local, regional and international press about the Commonwealth Litter Programme (Table 1.1, Table 1.2). A full list can be found in Appendix 1.

Table 1.1 Traditional media articles during the Belize phase of CLiP broken down by outlet

Outlet	Number of articles
Ambergris Caye Forum	1
Belize Economist	1
Belize Government Press Office	2
Belize Reporter	1
Breaking Belize News	2
Channel 5	6
Channel 7	6
Fiesta FM Orange Walk	1
Foreign Affairs.co.nz	1
Love FM	4
Reef TV	1
San Pedro Sun	4

Table 1.2 Media statistics in relation to outreach in Belize during CLiP

Other media:	
Newspapers /	8
Online articles	4
Radio	4
Television	13

## 1.5 Online presence

Belize is more connected online than the global average. 60% of the Belizean population use the internet and social media<sup>4</sup> and there are more mobile subscriptions than people. New connections are growing rapidly, with an extra 20,000 social media and internet users in Belize in 2019 compared to 2018<sup>5</sup>.

<sup>4</sup> DataRePortal; accessed 28/11/19

<sup>5</sup> DataRePortal; accessed 28/11/19

Digital and social media play an important role in outreach as they are a cost-effective way to reach a significant percentage of the population who are members of social networks in an accessible, convenient way.

### 1.5.1 Facebook

The social media approach was primarily focused on Facebook as this is by far the most commonly used social media platform in Belize (57.9% of Belizeans)<sup>5</sup>. The Facebook page was used to build followers who would gain an interest in the programme, but also in wider marine litter issues to encourage personal and community responsibility to address issues and reduce marine litter where possible (Table 1.3).

Posts were designed to make the issues relevant to those communities and demonstrate direct engagement of the team with both the government and local society, showing monitoring and beach cleans, with an ethos of working with the countries collaboratively. Social media also involved engaging with the CLiP sub-contractors so that all aspects of the programme were represented in the Facebook feed.

During the time in the Caribbean, the CLiP Facebook page was a key part of the outreach, with good interaction from people across both Belize and previous CLiP countries.

The platform was used to build a community with an interest in improving the situation regarding marine litter, by raising awareness of issues, encouraging behavioral change, and motivating people to take responsibility and seek community and national changes. There were frequent positive comments on how beneficial the programme is. There was also some discussion between people on ways to improve their local situation. There is an appetite for knowledge from those engaged in the CLiP page and to have access to resources such as the CLiP community packs and best practice guidance. These are available on the CLiP Website ([www.cefascos.co.uk/clip/](http://www.cefascos.co.uk/clip/))

Table 1.3 Facebook analytics

	Reach	Post engagements	Engagement rate
CLiP Facebook Page	625,186	49,392	8%

Posts on the CLiP Facebook page reached 625,186 timelines and were engaged with (e.g. liked, shared, commented, watched) 49,392 times for an engagement rate by reach of 8%. This is a very high score compared to social media industry guidance that 1-2% engagement is considered “good”<sup>6</sup>.

<sup>5</sup> DataRePortal; accessed 28/11/19

<sup>6</sup> Acumen, accessed 30/03/2020

### 1.5.2 Other social media

Twitter and Instagram were also used as social media platforms but were used more to promote the programme rather than as outreach. The general Cefas Twitter and Instagram accounts were used to highlight key milestones such as the national policy workshops and the conference.

Cefas Twitter and Instagram accounts were used to promote the activities, but these audiences tend to be more European, so were less directly useful in community outreach.

Social media outreach was also coordinated with the UK Department of the Environment, Food and Rural Affairs (Defra) and the UK Foreign and Commonwealth Office, enabling a greater reach. The Defra Instagram story about the South Pacific CLiP conference received 113 views and their Instagram story was reposted on the Cefas Instagram account, getting 90 views.

### 1.5.3 Website

Other online outreach took the form of the [cefas.co.uk/clip](http://cefas.co.uk/clip) website where information about the programme and links to press releases were provided. The website is used as a source of information on the programme, hosting infographics, news updates and details of the CLiP initiative. Content continues to be added as it becomes available, including conference presentations and information about the winners of the Pacific Marine Litter Challenge. The CLiP website brings together all the outreach and many scientific outputs so interested parties can explore the work delivered on one platform. During the Belize phase the CLiP subsite reported 3,358 page views and 2,719 unique page views.

## 1.6 Discussion and recommendations

Outreach took various forms in Belize with face-to-face meetings and workshops playing a crucial role in spreading the word on the CLiP project and issues around marine litter. Stakeholder mapping identified groups and companies with which to engage.

Social media, the radio and local newspapers provided additional opportunities to talk about CLiP and explain the issues and solutions. Making personal connections either face-to-face, or through social media, often leads to cascading influence when those people then share information with their friends and families. As such, the impact of CLiP outreach will be far larger than what can be measured directly.

Future priority outreach and awareness raising activities are identified, agreed and prioritised by a range of stakeholders in the Belize Marine Litter Action Plan. A total of seven actions (Nos. 18 – 25) are defined to build on and expand activities introduced during CLiP. There are some fantastic examples of community groups already working to reduce marine litter (many of these are profiled with the best practice reports in Section 9). With a centralised push from the government to expand these efforts, actions can really start solving some of the marine litter issues in Belize.

There was clear consensus among stakeholders of all kinds that outreach is a critical tool in bringing about change in Belize, and the importance of social media will assist in this effort. As CLiP moves into other Commonwealth countries, the CLiP community will grow, creating links



between the various countries. For future countries the following recommendations should be considered:

- Closer links with the socio-economic work in country can help tailor outreach activities and channel into different communities.
- Early efforts to publicise the social media channels are required to grow a following.
- An early stakeholder workshop to announce the project would be useful to gain contacts early on in the project.
- Stakeholder mapping should be carried out to help identify stakeholders to engage in outreach.

## **2 Best practices**

### **2.1 Introduction and approach**

Best practices for tackling marine litter refer to initiatives and methods designed to reduce and prevent litter leaking into the marine environment. Such initiatives can focus on changing processes in fields like waste management, or on raising awareness through education to alter people's behaviour (Orthodoxou et al., 2014). There are numerous publications on best practices to combat marine litter, covering various geographic regions and topics.

Best practices range from government level development of policies and legislation down to what a single business or boat owner can do in their daily activities (Hall et al., 2018; MERRAC, 2015; Ribbink et al., 2017; Shevealy et al., 2012). The success of local implementation of best practices relies on selecting those which fit local government policies, economic situation and stakeholder needs (Corbin et al., 2014). This makes a preliminary investigation of the situation on the ground essential. Equally critical for success is that practices are monitored after implementation to make adjustments if needed and evaluate their effects against predicted outcomes (Veiga et al., 2016a).

CLiP beach surveys across Belize found that the top 30 items collected on beaches were all land-based (see the CLiP monitoring and monitoring training report). This agrees with the common assumption that the majority of global marine litter comes from land-based sources (e.g. Veiga et al., 2016b). Because of this, work on best practices in Belize was focused on those that improved (municipal) waste management methods, or increased awareness of litter and its management among the population. The CLiP team sought to bring together and highlight examples of best practice across Belize to facilitate the scaling up of these ideas. But also, to demonstrate how they could be improved from direct demonstrations from the CLiP team and/or by facilitating knowledge sharing amongst practitioners.

The work on promoting best practices in Belize started by searching for key stakeholders and key issues through desktop research followed by ongoing discussions with in country contacts. Meetings were held with a variety of stakeholders to address the key issues and discuss best practices to improve their management and reduce waste generation and potential leakage of that waste into the environment.

Following these initial stakeholder meetings, a best practice workshop was organised which brought together government, businesses and NGOs. Examples of suggested best practices

were presented and discussed within the Belizean context. Following the prioritisation, steps were outlined to take these best practices forward. The outcomes of all these meetings were fed into the national Belize Marine Litter Action Plan.

## 2.2 Stakeholder meetings

Meetings and workshops with stakeholders were held to better understand the waste management processes and best practices in Belize and provided a good overview of the current situation in order to develop future actions.

### 2.2.1 Belize Solid Waste Management Authority (BSWaMA)

CLiP met with BSWaMA on 24 May 2019 as well as a subsequent visit to the Belize City transfer station and landfill site on 04 June 2019.

The Solid Waste Management Project phase I ran from 2009 to 2015, with objectives to close down four major dump sites in the western corridor and construct five transfer stations in their place. A national sanitary landfill was also constructed at Mile 24 of the George Price Highway designed to take the nation's solid waste via a network of local transfer stations. Phase II of the Solid Waste Management Project commencement is upcoming and is focused on waste separation and additional transfer sites. These projects were funded by Inter-American Development Bank, phase I costing \$10 million and Phase II costing \$14 million.

The Belize City transfer station (Figure 2.1) receives 60-68 tonnes of waste daily, which is not pre-sorted. Self-employed recyclers then take out any recyclable materials before it is weighed and taken to the sanitary landfill at mile 24. The recyclers are provided with PPE and Health and Safety training, but they are not paid. They collect plastic and plastic bottles, metals, tin cans, e-waste and copper but only about 2% of the recyclables delivered at the transfer station is recovered. Mostly this is sold to a large recycler such as Belize Recycling Company who then export this for recycling to Guatemala or Mexico as there is no recycling capacity in Belize. However, rapidly growing population centres often highlight problems in the existing waste management infrastructure. For example, in San Pedro, growth has been so rapid that issues surrounding responsibility and enforcement of waste collection services to transport waste to the transport station and the capacity of the station itself have not been properly addressed. This has led to problematic and widespread illegal dumping of waste, potential impacting the tourist industry the town has grown so rapidly on. There are concerns that other hotspots such as Caye Caulker and Placencia could follow a similar pattern. Moreover, Belize has a recognised issue in the lack of waste collection services for some smaller rural villages. This exacerbates issues such as illegal dumping and burning.

BSWaMA identified that promotion of waste sorting at source to the public is required to separate into recyclable, non-recyclable and organic streams. They also highlighted the need to analyse business models and business cases for plastic recycling as a key interest. There are plans for better practices around waste management, such as the new transfer stations for other municipalities and the introduction of a two- bin system as part of Phase II.



Figure 2.1 Belize City transfer station <sup>7</sup>

### 2.2.2 Chaa Creek Resort

Composting is a common best practice activity that can greatly reduce the volume of organic waste ending up in landfill. Chaa Creek was identified as a stakeholder already carrying out and teaching composting techniques. CLiP visited the Chaa Creek Resort on 06 June 2019 to learn about their composting methods and other best practices. They were considered a good example of best practice within the country. Although the Chaa Creek team were unable to join the best practices workshop their General Manager and Horticulturist shared many lessons with the CLiP team and their contact details were shared at the workshop.

Chaa Creek Resort is set within a 400 acre nature reserve located in the Cayo District of Belize, providing accommodation and educational and tourism activities. They run an education scholarship program supporting preservation of the natural environment as well as other ethical causes including revenue which goes directly into environmental and community projects. The resort is looking for additional sustainable practices and waste reduction.

There is a 33 acre organic farm within the resort which provides fresh produce for guests. The compost produced and used at Chaa Creek is named 'Bokashi' meaning 'fermented organic matter' (Figure 2.2). This is derived from materials such as horse, chicken and sheep manure, dry grass and leaves, coffee grains, wood shavings, garden waste and kitchen waste such as fruit or vegetable peelings. Additional nutrients are added to the waste material including NPK (Nitrogen, Phosphorus and Potassium) essential elements used for plant survival and further elements and minerals necessary for plant growth. The compost breaks down for 2-3 months depending on the nutrient mixture used. The compost is turned over in an open-air environment or under a roof during rainy season to prevent loss of nutrients. Raised beds are also used to produce a humus using worms. Compost tea is made by diluting the compost in

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<sup>7</sup> Source: <http://belizeswama.com/belize-city/> accessed: 06/12/2019

water and distributing this via an irrigation line to the soil. The composting techniques used within the farm are an advanced example of composting best practice and the resort also provides educational programmes to introduce communities to composting methods, including setting up composting for communities or schools. Additional outreach includes tours of the organic farm to tourists and visitors.



Figure 2.2 Chaa Creek Resort compost beds and trays growing seedlings using that compost

### 2.2.3 Bowen and Bowen Limited (B&B) and Resource Recovery Recycling (RRR)

CLiP met with RRR on 29 May 2019 to better understand the current waste management practices and discuss some of the key issues and potential changes that could improve practices in Belize. This was also a useful insight in how the recovery of bottles by B&B works. RRR process plastic, predominantly PET, mostly on behalf of B&B, which have an incentivised deposit scheme through which they recover about 30% of PET bottles (pers. comm., Michael Kell, RRR).

B&B have implemented a deposit return scheme that works whereby the company charges a deposit for the glass drinks bottles purchased and they then collect back these bottles for reuse. B&B currently recovers approximately 70% of all of the bottles they sell (pers. comm., Reynalda Barona, B&B), and this is expected to increase after the planned opening of a facility in the south of the country. Very few locally produced glass bottles are received by the transfer station and very few were collected during CLiP beach monitoring, suggesting that this is an efficient and effective best practice example in Belize.

B&B also implement this system, with a lower deposit value, for Coke, Sprite and Fanta plastic soda bottles which are recycled using a grinder. RRR process these PET plastic bottles, predominantly PET - they granulate it and ship it out in containers of approximately 40,000lbs. Only uncontaminated plastics can be recycled so RRR do not buy any waste from the transfer stations where there is organic contamination due to a lack of pre-sorting. They do not have the capacity to wash materials although this would be of value to them; clean, good condition plastics are required for quality recycling and currently RRR need larger volumes as their machines are not at full capacity. A problem for procuring enough material is that in Belize City the collection company has exclusive collection rights and therefore RRR must collect and pay for the refuse. However, outside of Belize City the waste collection tends to be run by councils.

The overall value of plastic has also decreased as the price of oil decreased but the type of plastic with the highest value is clear (transparent) PET.

RRR also process some e-waste and PVS containers - these materials are exported to China but not on a regular basis due to fluctuations in the market value.

RRR identified some of the key issues around marine litter in Belize such as on the beaches where there is an increasing two-fold issue with litter and Sargassum seaweed washing up in tangles. This is a well-known problem across the country and tourists are also very much aware. RRR would like to start composting with a compost machine from Direct Compost Solutions and also identified that more materials need to be recycled rather than just predominantly clear PET and compacted aluminum.

#### 2.2.4 Miscellaneous observations

- DML Bamboo straws: a company located in Hopkins, founded by Mark Jacobs an entrepreneur who makes bamboo straws as a natural and reusable alternative to plastic straws.
- Madisco: Madisco produce eco-friendly clamshell containers which are made from biodegradable materials. There are some problems with containers being made from part biodegradable and part plastic-based material which means they are not actually biodegradable. Madisco containers can be degraded in 2-3 months in composting conditions.

## 2.3 Best practice workshop

The CLiP best practice workshop took place on Friday 07 June 2019 between 9:30 am and 1:30 pm (Figure 2.3). It was hosted at the military base of Price Barracks, Belize City thanks to support from the British Army Training Support Unit Belize (BATSUB).

Attendees of the workshop included representatives from BATSUB, Belize Mayor's Association, British High Commission, Belize Department of Education, DOE, BSWaMA, CZMAI, San Pedro Town Council, MADISCO, Belize Brewing Company, Belize Recycling Company, Belize City Council (CitCo), The Scouts Association of Belize, Eco-Friendly Solutions, and the Belize Chamber of Commerce.

### 2.3.1 Topic prioritisation

The participants were invited to identify existing examples of good practices in managing waste in Belize and how these might be scaled up, as well as cases where further action is needed. Participants were encouraged, with help from Cefas experts, to share ideas on improving/scaling up practices already in country and identify practices which could be adopted from abroad. The merits of national and international examples of best practices were discussed by participants. The attendees were then asked to discuss the merits of each example and vote accordingly to prioritise the best practices that would achieve most impact. Table 2.1 contains a list of these best practices along with the votes received from the attendees.

Table 2.1 Results of the vote to prioritise discussed best practices from the best practice workshop



Best practices	Discussion points	Votes received
Education	Educating people is seen as more effective than the economic incentives as there is quite a low value associated with much of the litter. The importance of waste management and separation should be reinforced through education and would make recovery of valuable waste easier. This can also influence behaviour change resulting in reduced amounts of littering and reduction in waste production.	9
Legislation and enforcement	<p>Currently town councils are responsible for following up on littering fines and only sanitation officers and special constables have the authority to issue tickets. To tackle littering country-wide, it was suggested that all enforcement officers should be able to issue fines. This could help to change the culture and mindset around littering and provide consequences for offences.</p> <p>For buses, it was suggested that bus conductors should be able to issue tickets. Currently only two companies have waste collection on buses.</p>	8
Incentives for reusable items (Cafeterias in schools/offices to shift to reusable items)	<p>Concerns were raised over schools having very limited time available and that this system may have an impact on the timetable, implications for the cost of the meals and issues with staffing.</p> <p>Some schools already do this e.g. Belize Rural but most have a rented cafeteria which may be more difficult.</p> <p>Examples of where this has been carried out were provided (e.g. Japan) in which children bring their own plates and utensils and also develop skills by cleaning and reusing these. A similar practise was suggested to be investigated noting however that some schools do not have access to potable water.</p> <p>The best practice could also be implemented by private and governmental sectors in which organisations provide containers for employees. This best practise is likely to require policy implementation.</p>	6
Deposit-return scheme (as done by Bowen and Bowen Ltd)	The company Bowen and Bowen buys back the bottles from the consumers. A few stakeholders in the room suggested this as a best practice and suggested it should be upscaled, involving other companies.	5
Standardisation of bins and refuse sacks	This would help to reduce land-based litter. Current issues include damage of refuse sacks by animals or by people to access the most valuable waste items which results in littering. This could be reduced by standardised waste collections to reduce the amount of time this is left on the street and also standardised bins to better secure the waste.	2
Improved system of	If separation was to occur prior to collection, using for example different waste containers, then recovery and recycling would also be	2

separation and collection schedule	more efficient. Standardised waste collections would reduce the amount of time that litter is subject to interference and would help to reduce littering (see standardisation of bins above).	
Composting	Composting at both local and national scale was suggested by several attendees as a best practice to be upscaled in Belize to effectively manage organic waste.	2
Creating a national network for recycling	The creation of a national recyclers' cooperative among all recyclers in the transfer stations is already in progress. The time frame for the project was questioned since it had been presented in the past. A period of 2 years was forecasted for the development of the project.  Many different government departments are involved in very many aspects of waste management so difficult to make changes.	2
Water filling stations in supermarkets	Installing these stations would aim at reducing single-use plastics from drinking water bottles.	1
Energy from waste	Increasing the value of waste which cannot be recycled through the production of energy from this waste and would include process of the waste at the transfer stations.  It was mentioned that in San Pedro an incinerator is seen as a best practice to adopt.	1
Citizen science projects	These projects should aim at increasing local awareness. Another programme 'Adopt a beach' was also suggested as an example of making people responsible for cleaning specific areas.	1
Standardised plastic bottles	This best practice was suggested to improve recycling rates because no sorting would be required based on brands and all material could be recovered (PET and glass in particular). However, the commercial impact and high costs of the process were raised as potential concerns.	0
Belize recycle and reuse in country rather than exporting	Most of the recyclables are currently collected and exported. The suggestion would include the development of industrial facilities to create new products directly from the collected material within the country.	0



Figure 2.3 A moment of the best practice workshop



### 2.3.2 Further discussion of priority best practices

- Education and outreach: This should be extended outside of the national curriculum and focus both on formal and informal education in schools and communities respectively. A national approach could provide consistency and lead to a cultural change and obligation to taking care of the environment. Training for various target groups could also help to tackle waste management across different industries.
- Deposit return schemes: The company Bowen and Bowen currently recovers approximately 70% of bottles they sell through implementation of a deposit return scheme. This system could be implemented on a larger scale across other companies and materials.
- Legislation and enforcement: A more efficient system for issuing and collecting fines for littering offences helps to implement legislation and support culture change. Other enforcement officers should be given the power to issue tickets and penalties should be higher.
- Reusable items: Refill stations and use of reusable containers could be implemented in workplaces and schools. Discount incentives could also be implemented to encourage the use of reusable items with involvement by businesses.

## 2.4 Discussion

There are many efforts ongoing within Belize to address issues in waste management and plastic pollution. Examples of best practices already occurring include innovative ideas for the use of sustainable materials, reuse and recycling of products and composting.

The priority practices identified during the best practices workshop were legislation and enforcement, education, incentives for reusable containers and deposit return schemes. Other practices suggested included: improvement of the current refuse collection system including scheduling and standardisation of bins, creation of a national recycling network and a wider availability of water refill stations, for example in supermarkets. The deposit return scheme implemented and operated by Bowen and Bowen for locally brewed beverages sees very high return statistics, making it a great example of best practice that could be expanded and scaled up to other producers and industries. However, there are issues around the returning of bottles of imported products, as there are currently no restrictions on the materials being used and there is no scheme in place to return or recycle these.

Many of the discussions during the workshops were focused on current waste management system specifically, the lack of waste separation practices and problems with littering due to refuse collection schedules. Currently, no source separation occurs, resulting in lower recycling rates and higher percentages of recyclables being sent to landfill. This is in part due to contamination, limited time for informal waste pickers to separate recyclables from the waste stream at transfer stations and a general lack of recycling infrastructure in Belize. However, there are some small-scale examples of recycling in Belize, for example RRR, or on a local level such as glass collection on San Pedro by a local artist.

The single-use plastic ban which has been passed by the Belizean government is still yet to be implemented and enforced at the time of writing of this report. The ban aims to reduce litter by prohibiting the use of commonly used and unmanaged items made of single-use plastic or polystyrene such as, straws, clamshell food containers and plastic bags. Similar bans have

occurred globally and have been successful, when stakeholders are properly consulted, in reducing the amount of these items in the environment. There are already some alternatives being developed and used in Belize such as reusable or biodegradable materials. However, caution should be taken with the adoption of any 'biodegradable' plastic alternatives, as they often do not degrade in standard environmental conditions and behave in a similar way to plastics once in the environment. Moreover, there are many different types of 'biodegradable' or 'compostable' plastics, which results in confusion among the public and a need for new costly waste treatment facilities to process them. A good start would be to define biodegradable plastics. At the time of writing the Department of the Environment was consulting on and writing these definitions.

Although composting household green waste and food waste occurs in rural areas and on a small scale, there is no wider government-led plan or incentive for composting of organic waste. Companies such as Chaa Creek are leaders in this practice and offer sessions on composting practices to local communities, schools and other companies. While it was suggested that Belize could benefit from increased organic waste composting, during the best practice workshop, it was not highlighted as a priority. However, when discussing the practice with businesses, particularly in urban areas, there were issues surrounding space and time needed to maintain compost sites.

## 2.5 Forward look and recommendations

The collaborative effort of the best practices workshop resulted in the clear ranking of priorities and follow up actions mentioned above. Further development of waste management best practices would clearly benefit from continued close collaboration between government, businesses and NGOs in which new plans and monitored progress of implemented practices are shared to optimise their chances of success. The results of the workshop were fed into the workshop organised by CLiP that followed, facilitating the conversation and providing a clear evidence of what people in the country identify as priority.

Priority best practices to take forward as determined at the workshop are:

- The extension of education and outreach outside of the national curriculum and a focus on both formal and informal education in schools and communities respectively
- Improving the system through which fines for littering offences are collected to help implement legislation and support culture change
- The implementation of the current bottle return scheme on a larger scale, including more companies and covering more materials
- Promoting the use of refill stations and reusable containers in workplaces and schools

The Belize Marine Litter Action Plan (MLAP) has incorporated these recommendations in the land-based sources and the outreach and education actions. The MLAP should be used as useful framework to coordinate efforts across all sectors in Belize to help realise the recommendations of this report.

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## Appendix 1: Media coverage during CLiP Belize

Event	Outlet	Date	Link	Media
<b>Kick off</b>	Love FM	22/05/2019	No link available	Radio
<b>Kick off</b>	Breaking Belize News	23/05/2019	<a href="https://www.breakingbelizenews.com/2019/05/23/uk-marine-scientists-begin-work-to-deliver-marine-litter-action-in-belize/">https://www.breakingbelizenews.com/2019/05/23/uk-marine-scientists-begin-work-to-deliver-marine-litter-action-in-belize/</a>	Newspaper and online
<b>Kick off</b>	Love FM	23/05/2019	<a href="http://lovefm.com/commonwealth-assisting-belize-eradicate-marine-litter/">http://lovefm.com/commonwealth-assisting-belize-eradicate-marine-litter/</a>	Radio and online
<b>Training</b>	San Pedro Sun	03/06/2019	<a href="https://www.sanpedrosun.com/environment/2019/06/03/belize-and-uk-scientists-join-forces-to-tackle-marine-litter/">https://www.sanpedrosun.com/environment/2019/06/03/belize-and-uk-scientists-join-forces-to-tackle-marine-litter/</a>	Newspaper and online
<b>Best practice workshop (no press release)</b>	Love FM	07/06/2019	<a href="http://lovefm.com/commonwealth-litter-programme-clip-ready-clean-marine-litter/">http://lovefm.com/commonwealth-litter-programme-clip-ready-clean-marine-litter/</a>	Radio and Online
<b>National workshop</b>	Channel 5	02/07/2019	<a href="https://edition.cnn.com/archives/187370">https://edition.cnn.com/archives/187370</a>	TV and online
<b>Targeted workshops</b>	Channel 5	03/07/2019	<a href="https://edition.cnn.com/archives/187452">https://edition.cnn.com/archives/187452</a>	TV and online
<b>National workshop</b>	Belize Government Press Office	08/07/2019	<a href="https://www.facebook.com/GOBPressOffice/photos/a.150654578303387/2278565745512249/?type=1&amp;theater">https://www.facebook.com/GOBPressOffice/photos/a.150654578303387/2278565745512249/?type=1&amp;theater</a>	Online
<b>National workshop</b>	San Pedro Sun	09/07/2019	<a href="https://www.sanpedrosun.com/environment/2019">https://www.sanpedrosun.com/environment/2019</a>	Newspaper and online

			<a href="#">/07/09/developing-belizes-marine-litter-and-waste-management-policy-and-action-plan/</a>	
<b>National workshop</b>	Channel 7	12/07/2019	No link available	TV
<b>National workshop</b>	Love FM	12/07/2019	<a href="http://lovefm.com/national-workshop-marine-litter/">http://lovefm.com/national-workshop-marine-litter/</a>	Radion and online
<b>National workshop</b>	Belize Government Press Office	23/07/2019	<a href="http://bbs.gov.bz/events/event/development-marine-litter-waste-management-policy/">http://bbs.gov.bz/events/event/development-marine-litter-waste-management-policy/</a>	Online
<b>National workshop</b>	Channel 7	09/08/2019	<a href="http://www.7newsbelize.com/story.php?nid=49916&amp;frmsrch=1">http://www.7newsbelize.com/story.php?nid=49916&amp;frmsrch=1</a>	TV and online
<b>Regional meeting</b>	Breaking Belize News	30/08/2019	<a href="https://www.breakingbelizenews.com/2019/08/30/head-of-british-diplomatic-service-to-engage-in-marine-litter-beach-clean-up/">https://www.breakingbelizenews.com/2019/08/30/head-of-british-diplomatic-service-to-engage-in-marine-litter-beach-clean-up/</a>	Newspaper and online
<b>Regional meeting</b>	Belize Economist	03/09/2019	<a href="http://economist.bz/a-beach-marine-litter-survey-and-clean-up-held-sunday-at-belizean-beach/">http://economist.bz/a-beach-marine-litter-survey-and-clean-up-held-sunday-at-belizean-beach/</a>	Newspaper and online
<b>Conference week - action plan launched</b>	Channel 5	03/09/2019	<a href="https://edition.cchannel5belize.com/archives/190612">https://edition.cchannel5belize.com/archives/190612</a>	TV and online
<b>Conference week</b>	Fiesta FM Orange Walk	03/09/2019	No link available	Radio
<b>Conference week</b>	Reef TV	03/09/2019	<a href="https://www.facebook.com/reeftv20/videos/1205996172894299/">https://www.facebook.com/reeftv20/videos/1205996172894299/</a>	TV and online

<b>Conference week - action plan launched</b>	Channel 5	04/09/2019	<a href="https://edition.cchannel5belize.com/archives/190701">https://edition.cchannel5belize.com/archives/190701</a>	TV and online
<b>Conference week - action plan launched</b>	Channel 7	04/09/2019	<a href="http://www.7newsbelize.com/story.php?nid=50200&amp;frmsrch=1">http://www.7newsbelize.com/story.php?nid=50200&amp;frmsrch=1</a>	TV and online
<b>Conference week - action plan launched</b>	Channel 7	04/09/2019	<a href="http://www.7newsbelize.com/story.php?nid=50201&amp;frmsrch=1">http://www.7newsbelize.com/story.php?nid=50201&amp;frmsrch=1</a>	TV and online
<b>Conference week - action plan launched</b>	Channel 7	04/09/2019	<a href="http://www.7newsbelize.com/story.php?nid=50202&amp;frmsrch=1">http://www.7newsbelize.com/story.php?nid=50202&amp;frmsrch=1</a>	TV and online
<b>Conference week - action plan launched</b>	Ambergris Caye Forum	05/09/2019	<a href="https://ambergriscaye.com/forum/ubbthreads.php/topics/538115/enforcing-litter-laws.html">https://ambergriscaye.com/forum/ubbthreads.php/topics/538115/enforcing-litter-laws.html</a>	Online
<b>Regional meeting</b>	Belize Reporter	05/09/2019	<a href="https://reporter.bz/2019/09/05/finally-they-are-realizing-we-are-killing-our-oceans/">https://reporter.bz/2019/09/05/finally-they-are-realizing-we-are-killing-our-oceans/</a>	Newspaper and online
<b>Conference</b>	Channel 5	05/09/2019	<a href="https://edition.cchannel5belize.com/archives/190760">https://edition.cchannel5belize.com/archives/190760</a>	TV and online
<b>Conference week - action plan launched</b>	Channel 5	05/09/2019	<a href="https://www.youtube.com/watch?v=16wgfpZteU">https://www.youtube.com/watch?v=16wgfpZteU</a>	TV and online
<b>Regional meeting</b>	Channel 7	05/09/2019	<a href="http://www.7newsbelize.com/story.php?nid=50223&amp;frmsrch=1">http://www.7newsbelize.com/story.php?nid=50223&amp;frmsrch=1</a>	TV and online
<b>Conference week - regional attendance</b>	Foreign Affairs.co.NZ	06/09/2019	<a href="https://foreignaffairs.co.nz/2019/09/07/mil-osi-united-kingdom-honduras-joins-high-level-dialogue-on-marine-litter-and-waste-management-in-the-caribbean/">https://foreignaffairs.co.nz/2019/09/07/mil-osi-united-kingdom-honduras-joins-high-level-dialogue-on-marine-litter-and-waste-management-in-the-caribbean/</a>	Online

<b>Conference week - action plan launched</b>	San Pedro Sun	07/09/2019	<a href="https://www.sanpedrosun.com/arts-culture/2019/09/07/students-turn-plastic-litter-into-art/">https://www.sanpedrosun.com/arts-culture/2019/09/07/students-turn-plastic-litter-into-art/</a>	Newspaper and online
<b>Post conference summary</b>	San Pedro Sun	12/09/2019	<a href="https://www.sanpedrosun.com/environment/2019/09/12/belize-to-lead-regional-plastic-litter-clean-up/">https://www.sanpedrosun.com/environment/2019/09/12/belize-to-lead-regional-plastic-litter-clean-up/</a>	Newspaper and online





# Centre for Environment Fisheries & Aquaculture Science



## About us

We are the Government's marine and freshwater science experts. We help keep our seas, ocean 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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- enable food security
- support marine economies.

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