



Commonwealth  
Litter Programme



# Report: Commonwealth Litter Programme: High-Level Dialogue on Marine Litter and Waste Management in the Caribbean Region

Wednesday 04 – Friday 06 September 2019, Belize City.

---

Lead Author: Dr. Andrea Clayton

Principal Lecturer, the Caribbean Maritime University, [aclayton@faculty.cmu.edu.jm](mailto:aclayton@faculty.cmu.edu.jm)

## Executive Summary

The nations of the Caribbean face a number of similar challenges relating to waste, with limited options for recovery or safe disposal. Marine litter is a particular problem, as tourism is by far the largest source of employment in the region and the primary source of foreign exchange for a number of Caribbean countries. Tourism is a major contribution to the Belizean economy and livelihoods of more than half the population. It accounts directly and indirectly for more than 40% of GDP, 50% of employment, 27% of total investments and visitor exports represents over 40% of total exports (2017 data from the World Travel and Tourism Council, 2018). Most of this tourism is based on access to sea, sun, sand and leisure cruises, and so is directly threatened by any marked deterioration in the quality of the marine environment. At present, however, illegal dumping and routine discharge and washing operations of vessels account for some 666,000 to 2.5 million tons of hydrocarbons<sup>1</sup> per year being improperly discharged from vessels into the ocean (Oceana, 2003; IDB, 2019); the World Bank (2019) reports that 85% of wastewater in the Caribbean region goes untreated into the ocean; and the United Nations Environment Programme (2018) reports that up to 80% of marine litter comes from land-based sources of solid waste, with approximately 65% of that waste disposed of in open dumps, inland waterways, coastal water bodies, or directly into the Caribbean Sea.

The Commonwealth Litter Programme (CLiP) is led by the UK government and delivered by the UK's Centre for Environment Fisheries and Aquaculture Science (Cefas). The Commonwealth Litter Programme (CLiP) works in five countries across the four regions in the Commonwealth (Africa, Asia, Caribbean, Pacific) with the aim of assisting host governments in developing evidence based marine litter action plans to remove marine litter from the environment and to address the sources. These plans can serve as a blueprint for other countries in the regions, potentially leading to a sustained reduction of marine litter at national, regional and global levels. Emphasising local collaboration and knowledge-sharing, the programme develops the scientific data and knowledge base, shares expertise and develops solutions to the environmental and socio-economic problems caused by marine litter. Local partners include governments, NGOs, universities, industry and local authorities.

The approach taken in the Caribbean encompassed all five CLiP pillars. These are land-based sources; sea-based sources; removal; science and research; and education and outreach. In the region, Belize provides the base from which CLiP's initiatives are launched. The results from the various studies highlight the need for coordinated efforts across the region, particularly with regard to plastics. Plastics make up 80% of the litter found in the world's ocean (Barne and Pirlea, 2019). It is also the major contributor to waste and marine litter in the Caribbean region. The results from the various assessments of the region, under CLiP's initiative, also highlight how waste materials are being unnecessarily directed into landfills, including organic waste that could be composted and/or used as an energy source. Separation of waste at source could simultaneously extend the life of existing

---

<sup>1</sup> Hydrocarbons are chemical compounds usually present in crude oil and natural gas.

landfills, reduce the need for imported oil and liquefied natural gas (LNG) and reduce the region's carbon footprint. There has been a problem with the lack of funding for these developments, but this could be overcome if new funding streams are made available. CLiP has been instrumental in helping to establish the Belize Marine Litter Action Plan (MLAP). The MLAP, combined with CLiP's regional call to action in the form of the high-level dialogue, focused the region's attention on finding collective, integrated solutions for the regional problem of marine litter.

The problems are region-wide, so should the solutions be. A holistic approach could encompass a number of country-specific and regional strategies, including measures to reduce consumer demand for single-use plastic items, the improvement of recycling and waste management infrastructure, better education and outreach, support for scientific based research and development and legislation to underpin all of the above.

# Table of Contents

Executive Summary .....	2
Introduction .....	5
The Belize Marine Litter Action Plan .....	7
The CLiP Caribbean High Level Regional Dialogue (4 – 6 September 2019) .....	8
Introduction.....	8
Structure.....	8
1. Developing marine litter science: toward better monitoring, enforcement and harmonization of marine litter management across the Wider Caribbean Region .....	9
2. Addressing sea-based sources of marine litter: coordinating action on auditing of ship generated waste across the WCR. ....	12
3. Addressing land-based sources of marine litter: coordinating and sharing waste management and recycling capabilities across the wider Caribbean region. ....	15
4. Exploring opportunities of how sustainable waste management and recycling can support the ‘blue economy’ .....	18
5. Incubator for marine litter and waste management .....	21
6. Education and outreach: sharing best practices across the Wider Caribbean Region .....	22
7. Financing the response to marine litter .....	24
8. World Café Action Stations .....	26
8.1 Monitoring and Ongoing Science .....	26
8.2 Eliminate Sea-based litter .....	26
8.3 Regulation and Legislation .....	27
8.4 Port Reception Facilities and Shipping Waste.....	27
8.5 Regional Cooperation for regional solid waste management .....	28
8.6 Outreach and Education .....	29

9. Going Forward .....	29
------------------------	----

## Introduction

### The Challenge of Marine Litter

Plastics now constitute the major part of marine litter (International Union for Conservation of Nature, 2018; Green and Jobling, 2018). This is because the use of plastics in disposable items is increasing and plastic is a very resilient product in the environment, breaking down into increasingly smaller fragments rather than breaking up (United Nations Environment Programme, 2018).

Some 1.15 to 2.41 million tonnes of plastic enter the ocean each year (Lebreton et al., 2017). About half of this waste is too light to sink and floats on the surface. Much of this then ends up either on beaches or in one of the five great marine garbage patches. One of the garbage patches, the Great Pacific Garbage Patch, is now about 1.6 million square kilometers in size (United Nations Environment Programme, 2018).

Plastic waste has a number of very harmful effects. Turtles choke on plastic bags, seals and dolphins get trapped in abandoned nets, and in areas with concentrations of plastic waste, such as the garbage patches, the layer of waste is thick enough to block the sunlight from penetrating the water and reaching plankton and algae below (National Geographic Society, n.d.). Marine litter therefore represents a major development challenge for the region, which is heavily dependent on the ocean economy (International Union for Conservation of Nature, 2018). Tourism and fisheries are particularly vulnerable (United Nations Environment Programme, 2018).

### The Commonwealth Litter Programme (CLiP)

The Commonwealth Litter Programme (CLiP) is delivered by the Centre of Environment, Fisheries and Aquaculture Science (Cefas). Funded by the UK's Department for Environment, Food and Rural Affairs (Defra), it supports developing countries across the Commonwealth to develop national litter action-plans focusing on reducing plastics and other waste items entering the ocean. The programme encompasses five pillars: land-based sources of litter; sea-based sources of litter; removal of litter from the marine environment; science; outreach and education.

CLiP is based on five pillars: land-based sources; sea-based sources; removal; education; science; and outreach and education. The programme helps the United Kingdom (UK) and partner states to meet their ambitions under the Commonwealth Blue Charter, which calls for Commonwealth countries to take action and share expertise on issues affecting the world's ocean, including marine litter. The Commonwealth Blue Charter is an agreement by the 53 Commonwealth countries to co-operate to

solve ocean-related problems and to meet their commitments for the sustainable development of the ocean. Commonwealth Blue Charter Action Groups are member-driven and led by ‘champion’ countries. To date, 12 countries have volunteered to be champions on nine topics that they have identified as priorities. The purpose of the action groups is to unlock the influence and resources of the member states and guide the development of relevant tools and training. The nine action groups are: the Commonwealth Clean Ocean Alliance (CCOA), Coral Reef Protection and Restoration, Mangrove Ecosystems and Livelihoods, Marine Protected Areas, Ocean Acidification, Ocean and Climate Change, Ocean Observation, Sustainable Aquaculture and the Sustainable Blue Economy. The Commonwealth Litter Programme contributes to delivering the objectives under the UK and Vanuatu-led CCOA, which calls on other countries to pledge action on tackling single-use plastics (SUP).

### The Commonwealth Litter Programme, Belize

CLiP activities in Belize were done in collaboration with the Department of the Environment (DOE). The DOE coordinated with Cefas on necessary research for the five CLiP pillars. These included identifying institutional capacity<sup>2</sup> needs as it relates to conducting monitoring, as well as, stakeholder information that would aid in understanding and developing actions to address marine litter in Belize. CLiP’s education and outreach initiatives also included a workshop on best practice. Belize’s workshop identified 4 top best practices:

- Increased education, particularly outside of schools
- Upscaling the deposit return scheme
- Legislation and enforcement
- Reusing items

Based on this collaboration, relevant stakeholders were contacted for their participation during all phases of CLiP activities in country<sup>3</sup>. This included capacity building for development of a microplastic lab; monitoring for microplastic and macroplastic using scientific protocols; understanding outreach and education; waste removal; stakeholder consultations through one-on-one and small group meetings, targeted stakeholder workshops, and the national workshop for the development of the Belize Marine Litter Action Plan (MLAP)<sup>4</sup>.

---

<sup>2</sup> A microplastics lab was setup under the supervision of DOE at UB premises and officers from DOE, University of Belize (UB), Coastal Zone Management Authority and Institute (CZMAI), Belize Bureau of Standards, Belize Agricultural and Health Authority (BAHA) and Bowen and Bowen Ltd (BandB) were trained in the analytical protocols for microplastics analysis.

<sup>3</sup> The DOE, CZMAI, UB, BandB, Oceana, and Tobacco Caye Marine Station were trained to carry out beach monitoring using the CLiP protocol and assisted in collecting data during the project.

<sup>4</sup> Cefas, under CLiP, coordinated outreach activities with key stakeholders in Belize, including, but not limited to the DOE, the Belize Audubon Society (BAS), the Scouts Association of Belize, the Belize Tourism Industry Association (BTIA), Toledo Institute for Development and Environment (TIDE), Brodie’s, and the Radisson Fort George Hotel and Marina.

## The Belize Marine Litter Action Plan

The Belize Marine Litter Action Plan (MLAP) was submitted to the Cabinet via Cabinet Memorandum No. 67 of 2019. The Government of Belize subsequently approved the *Marine Litter Action Plan: Belize – Blue, Clean, Resilient and Strong* - on 27 August 2019. It emphasises coordination, education and outreach; a multi-sectoral approach to developing solutions; scientific monitoring; evidence-based decision-making; continuous review, monitoring and evaluation of decisions and activities taken and the ongoing testing and demonstration of ideas that can address the problems of marine litter and waste management. The MLAP sets out the following key recommendations for addressing the problem of marine litter.

- Strengthen the institutional and financial capacity to conduct scientific monitoring programmes in Belize and contribute to regional data sets.
- Increase data collection, strengthen enforcement, develop evidence-based decision making, and generate the information needed as a basis for future policies and actions to address the problem of marine litter.
- Develop and implement a coordinated, long-term outreach campaign across multiple sectors and audiences addressing marine litter and waste management, with the goals of encouraging behavioural change in waste management and disposal and increasing the public understanding of the harm caused by marine litter to the Belizean people, the marine environment, and the Caribbean region.
- Develop and implement Marine Pollution Prevention Legislation to address the problems of waste from sea-based sources (maritime sector and port facilities), both plastic and other forms of marine pollution.
- Develop and implement a Waste Reduction Policy and Recycling Sector Policy and legislation to formalise and standardise waste management (collection and disposal), promote the development and strengthening of a recycling sector (inclusive of source separation), and reduce marine litter generated at source.
- Work towards building capacity in Belize through the DOE to focus on creating, demonstrating and testing scientific ideas/concepts that can reduce marine litter.

The Belize MLAP is envisioned as a framework for addressing marine litter and waste management; 'to lead the way in tackling marine litter and its sources through a Blue, Clean, Resilient and Strong Belize'. It is also intended to provide a framework for the policies and actions necessary for Belize to prevent and reduce marine litter and strengthen waste management in the marine environment. The document is intended to be a guide for policies and actions for capacity development (institutional and legal), to function as a management tool for resource mobilisation, to improve coordination between the public and private sector, to address data gaps through scientific research, support monitoring to improve decision making and to enable evidence-based outreach and education campaigns. It sets out recommendations for policies and actions to coordinate the management and protection of the natural resources in Belize that are particularly impacted by marine litter.

Belize is heavily dependent on the country's natural resources (both land and sea). The major industries are tourism and agriculture. With a population of less than 400,000, the country absorbed more than six times their local population in tourist arrivals in 2018 (Belize Tourism Board, 2018). This contributes significantly to the country's economic development and growth, but the additional pressure caused by tourism on waste management systems is also significant. The fishing and agricultural sectors made up approximately 3% of GDP in 2015, raising to 11.7% of GDP in 2016 (United Nations Conference on Trade and Development, 2017). This is not only important for the economy; for example, 90% of the lobster, conch and farmed shrimp are exported from Belize to foreign markets with over 2,700 licensed fisher folk in 2017. It is also important for the local population, especially in coastal areas, as Belizean people were estimated to consume 13.8 kg of fish per capita in 2013 (Food and Agriculture Organization of the United Nations, 2018).

The DOE provided technical advice throughout the project and during the workshops mentioned above, producing in collaboration with Cefas, a series of policy briefs and other supporting documents for the development of Belize's MLAP. This was followed by a high-level dialogue on marine litter and waste management in the Caribbean region in Belize City between Wednesday 04 – Friday 06 September 2019.

## **The CLiP Caribbean High Level Regional Dialogue (04 – 06 September 2019)**

### **Introduction**

The high-level dialogue is a call to collective action to address the problem of marine litter in the region and promote new and innovative initiatives to target the gaps in the region's current waste management strategies. The dialogue was hosted by the Belize Department of the Environment under the Ministry responsible for the Environment in partnership with Cefas, Defra, CLiP and British High Commission Belize, on Wednesday 04 to Friday 06 September 2019 at the Best Western Belize Biltmore Plaza, Belize City. The dialogue's purpose was to start new and continue ongoing regional conversations and consensus on the reduction and ultimately prevention of marine litter. The participants benefit from sharing their knowledge, experiences and exchanging of views with regard to best practices. This creates a network of regional practitioners, who share experiences and best practices, working together to formulate a collective response to the challenges.

### **Structure**

The Belize high-level dialogue was structured (see Appendix I) to facilitate sharing of best practices, the exchange of knowledge and experiences and next steps. Following the welcome dinner on 04 Wednesday 2019, the programme addressed each of the CLiP pillars (removal was combined with land-based sources) with sessions consisting of a presentation from Belizean and international experts and



other scientists alongside Cefas scientists. These presentations were followed by a Question and Answer session hosted by a session chair. Specific sessions on the Belize MLAP, coordination of efforts across the region and on funding sources were designed to build on conversations and ideas. This culminated in the 'World Café' session, where delegates were invited to break into groups and visit action stations of their choice themed on each of the programme sessions and to report back to plenary on key observations. This included sharing best practices in data collection, particularly in beach litter monitoring and education and outreach. The next five sections provide summaries of each agenda item at the conference and the report has been structured to reflect this order.

## 1. Developing marine litter science: toward better monitoring, enforcement and harmonization of marine litter management across the Wider Caribbean Region

**Presenters:** Mr. Peter Kohler, *Senior Marine Litter Scientist and Country Lead, CLiP Belize*;  
Dr. Abel Carrias, *Assistant Professor, University of Belize, Belize*  
Mr. Vincent Sweeney, *Head, Caribbean Sub-Regional Office UNEP*

The goal of this session was to explore opportunities to find solutions to shared challenges centered around the clear need to improve the monitoring, enforcement and harmonisation of marine litter management across the wider Caribbean region (WCR).

To ensure that the results were relevant to the region, Cefas adapted the OSPAR marine litter monitoring protocol<sup>5</sup> and made this bespoke to account for the specific circumstances in Belize and within the wider Caribbean region. These included, for example, adjustments that took into account the relatively restricted beach sizes, the sargassum loads present<sup>6</sup>, and the types of plastic fragments, among other factors. These adjustments were developed in parallel and mirrored those findings and recommendations of a report titled 'Harmonising marine litter in the Wider Caribbean Region' (Caporusso and Hougee 2019)<sup>7</sup>, which was published whilst Cefas was undertaking the monitoring exercise. The Cefas protocol also included the relevant categories of waste identified in South Pacific in the Tangaroa Blue<sup>8</sup> Protocol.

---

<sup>5</sup> The Convention for the Protection of the Marine Environment of the North-East Atlantic (the 'OSPAR Convention'), Paris 22 September 1992.

<sup>6</sup> Sargassum: The seaweed deluge hitting Caribbean shores <https://www.bbc.com/news/world-latin-america-45044513>

<sup>7</sup> Cited in Kohler's report

<sup>8</sup> Tangaroa Blue Foundation is an Australia-wide not-for-profit organisation dedicated to the removal and prevention of marine debris.

The Belize study focused on monitoring marine litter around the country's largest populated areas, including Belize City (city drainage canal), the Belize River (but not Haulover Creek as it is tidal) and beaches to the north and south of Belize City. The monitoring involved surveying up to 100 m stretches of beach from the high tide mark towards the back of each beach. As many of the local beaches were less than 100 m, the start and end point of the transect were recorded. Where the beach was not 100 m in length, the length was recorded in order to normalise the data post-survey, standardising the results and enabling site comparisons. In an adaption of the OSPAR protocol polystyrene and plastic were recorded separately, with foam items (cups and trays) analysed by size range;  $\leq 0-2.5\text{cm}$ ,  $\geq 2.5-50\text{cm}$  and  $>50\text{cm}$ , while the presence of sargassum was recorded in metadata.

The study began in May 2019 and analysed over 200 litter categories (170 OSPAR, plus 30 regional categories) to establish baseline data at six sites. Data was collected and analysed at an average of two-week intervals. Six beach-monitoring locations were included, the Caribbean Shrimp Farm, Manatee Sign, Belizean Beach (car park), Belizean Beach (Mangrove Bay), Marine Fish Farms and Dangriga Beach.

In all cases plastic was the most common litter item by type, with plastic pieces under 50cm representing approximately 37% of the litter collected at these sites. The top 10 most common items found on the beaches represented 70% of the total litter collected. The results attained at the Marine Fish Farm, Caribbean Shrimp Farm and the Belizean Beach were more doubtful, however, as the study could not determine the generating source of the waste, mainly because the litter type and quantities could be a reflection of the purpose of particular locations; Belizean Beach (a car-park), Marine Fish Farm (the amount of sargassum present), and Caribbean Shrimp Farm (land-based as opposed to marine litter).

River monitoring locations included the Mennonite Beach, Adventure Zone 1 and Adventure Zone 2, while city monitoring locations included BTL/Digi Park and Collet Canal. The top item collected were bottle caps at 11.1%. The top ten items collected in these areas represented 59% of the waste collected. However, the Adventure Zones monitoring was discontinued after the first survey, owing to the Adventure Zones being used as latrine and being too rocky and the subsequent discovery that the city council regularly cleaned the Collet Canal. As far as CLiP understood and could see, the BTL/Digi Park canal was not cleaned.

The microplastic lab also assessed microplastic types and their presence in the gastrointestinal (GI) tract of fresh water marine finfish species. It included Redhead Chichlid (*Cichlasoma synspilum*) representing riverine and Lane Snapper (*Lutjanus synagris*) representing marine environments. DOE requested Cefas focus on subsistence fish species for CLiP, to ensure local relevance to the study outputs. The specific species were identified after discussions with experts at the Belize Department for Fisheries, who selected these particular species as they (a) are subsistence species, (b) are carnivores and (c) have limited range – so do not move large distance to avoid contamination of microplastics from other sites. The native cichlid of Belize faces threat from invasive species such as

Tilapia and other anthropogenic and natural pressures. In addition to the provision of lab equipment under Cefas, the facility allowed for expert training to the DOE and University of Belize (UB) personnel on the necessary lab protocols and methods to assess microplastics in biota. This allowed the UB and the DOE to build local competencies in the study of microplastics in finfish and bivalves, with plans to expand research to a larger sample set and investigate further possible indicator species. The study, which included dissection and fluorescence analysis, concluded that there were no particles observed in any of the 30 marine samples to date. It was completely different for the freshwater fish, as fluorescent particles were observed in all samples. Further study on both fish types is required, due to limited sample studies and since the level of plastic observed in the GI tract of freshwater fish and the testing of the feed suggest that the plastics may be coming from a contaminated source, such as the corn feed which contains cellulose, hemicellulose and lignin.

In addition to the examination of the GI tract of the finfish, the lab also examined the presence of microplastics in Placencia's Beach sand. Fragments represented the most abundant forms of microplastic found, with 354 items present per m<sup>2</sup>. Foams were the least abundant.

## Outcomes of Discussions

The following points were raised in the ensuing discussion:

- Human health, ecosystem health and tourism are the primary concerns and the main reasons for collecting data and monitoring the management of waste in the region.
- Significant capacity constraints.

The key action that was recommended is the need to identify and prioritise the component tasks, and act accordingly.

## 2. Addressing sea-based sources of marine litter: coordinating action on auditing of ship generated waste across the WCR.

**Presenters:** Dr. Amardeep Wander, *Project Director, Asia Pacific Waste Consultants, Australia*  
Mr. Martin Alegria, *Chief Environmental Officer, Department of Environment, Belize;*  
Mr. Floyd Patterson, *Consultant, International Maritime Organisation, RAC/REMPEITC- Caribe, Curacao*

The goal was to explore opportunities to coordinate and improve national auditing and enforcement of ship-generated sources of marine litter items by sharing knowledge, data, and practices across the WCR.

Asia Pacific Waste Consultants (APWC) conducted audits of port reception facilities using the standard International Maritime Organization (IMO) approaches and methodologies for International Port of Call vessels, including those bearing Belize and foreign flags. The same methodology has been used in all previous audits and is utilised by the Regional Marine Pollution Emergency Information and Training Center (ReMPEITC) in the Caribbean and Secretariat of the Pacific Regional Environmental Programme (SPREP)/Australian Maritime Safety Authority (AMSA) in the Pacific.

### Methodology

#### Types of wastes assessed

The study assessed six types of waste as per Annex 1 (Prevention of pollution by oil effective Oct. 2, 1983), Annex II (Control of pollution by Noxious Liquid substances, effective Oct. 2, 1983), Annex III (Prevention of pollution by harmful substances carried by sea in packaging form, effective Jul. 1, 1992), Annex IV (Prevention of pollution by ships, effective Sept. 27, 2003), Annex V (Prevention of pollution by garbage from ships, effective Dec. 31, 1988) and Annex VI (Prevention of air pollution from ships) of MARPOL Regulations of relevant waste reception facilities. The details of this section focuses on the findings relating to Annex V. Three international ports for the purpose of providing customs and immigration clearances were used along with four international ports for pleasure craft and yachts. These include the Port of Belize Harbour, Port of Big Creek and Harvest Caye. Marinas for pleasure crafts and yachts moor included Cucumber Beach Marina (Old Belize), Fort George Jetty, Placencia Hotel Marina, and the Belize Yacht Club.

### Results

Findings prepared in accordance with IMOs guidelines for Ensuring the Adequacy of Port Waste Reception Facilities as outlined in Resolution MEPC.83 (44). The most significant ship-based source of waste is general garbage, including plastics. Cruise ships make up less than 1% of the global merchant

fleet but account for the largest level of activity at the ports of call in the study, ranging from a very conservative estimate of 700,000 to 1.2 million visitors in 2018. They are responsible for 25% of all waste generated by merchant vessels in the Caribbean and generate approximately 90% of the annual garbage generated at the ports (over 1 million kg) in Belize. However, it is unclear where the waste is being disposed of, especially since Belize is dependent on the regional reception facilities in other countries to deal with ship wastes (without formal agreements) and it has banned landing of international waste at the country's own ports, mainly because of capacity issues. This suggests that the regulatory system needs to be strengthened to move beyond mere trust, especially in light of the successful recent prosecution of Carnival Cruises for polluting waters and falsifying records<sup>9</sup>.

In Belize, there is almost no data on the waste generated by domestic fishing vessels despite having approximately 400 local fishing vessels. However, fishing cooperatives, which represent about 85% of all fishermen in the country, would be a good place to start for data collection and also to influence good waste management practices.

One of the key recommendations is that domestic shipping waste (fishing, touristic, harbour craft etc.) could be integrated with the existing land-based waste management system. Proper auditing of waste from all shipping sources (both international and local) is critically important in order to understand impacts and plan effective management.

The following 12 steps were recommended to address regional marine pollution:

1. Ban single-use plastic and implement litter control policies
2. Reduce, Reuse and Recycle
3. Reduce the discharge of waste in the ocean by treating and reusing gray water
4. Control chemical and industrial pollution by identifying and prosecuting polluters
5. Increase national funding for pollution control
6. Strengthen laws on marine litter at national and regional levels
7. Integrate prevention and control policies into national policies
8. Build local expertise and technical capacity
9. Build public awareness
10. Establish public/private/NGO partnerships
11. Monitor marine pollution
12. Measure and share economic impact

## Outcomes of Discussions

The following points were highlighted after the presentations:

---

<sup>9</sup> Carnival Cruise to Pay \$20 Million After Admitting to Dumping Plastic Waste in the Bahamas, Forbes June 11 2019

<https://www.forbes.com/sites/trevornace/2019/06/11/carnival-cruise-to-pay-20-million-after-admitting-to-dumping-plastic-waste-in-the-bahamas/#33eed0413a6f>

- Ships find it difficult to comply with the International Convention for the Prevention of Pollution from Ships (MARPOL) regulations, given the lack of adequate facilities.
- Sea litter is a problem for countries that rely on marine trade and tourism.

The discussions resulted in the following recommendations:

- a) Countries should accede to MARPOL, specifically Annex I, Annex IV, and Annex V.
- b) Countries should accede to the United Nations Convention on the Law of the Sea.
- c) Education programmes designed to inform about the benefits of signing the conventions.
- d) Publicising the connection between poor port management and human health impacts.
- e) Consider adopting US Coast Guard protocols for identifying marine polluters.
- f) Install liquid discharge monitors in waste disposal sites.
- g) Create national committees to develop strategies and monitor progress.

### 3. Addressing land-based sources of marine litter: coordinating and sharing waste management and recycling capabilities across the WCR.

**Presenters:** Dr. Amardeep Wander, *Project Director, Asia Pacific Waste Consultants, Australia*  
Mr. Juan Polanco, *Private Sector Representative, Belize Solid Waste Management Authority*

The study examined Belize's current waste management system, with four questions:

- 1) How much waste is generated in urban centres and rural communities?
- 2) Do waste generation rates differ and will that change over time?
- 3) How will that inform future decisions about policies and infrastructure?
- 4) What does the community think about the issue?

#### Methodology

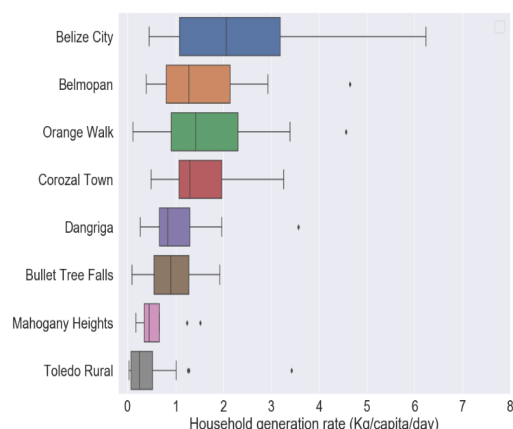
The Asia Pacific Waste Consultants (APWC) collaborated with Toledo Institute for Development and Environment (TIDE) Belize, the Belize Department of the Environment, Mayors and Sanitation Departments from five districts, and the Japan International Cooperation Agency (JICA) volunteers. Household data incorporated information about the population, households, growth data and income levels along with secondary data from 2010 audits. Interviews were conducted with households from which waste was collected to establish the correlation between waste composition and qualitative data. A representative sample was based on urban/rural, income and resource levels (low, medium, high) and level of effort. Weight and volume of materials collected from households were measured and EPA conversion factors applied.

Type of Sample	No. households	Area
Urban agglomerate	150	Belmopan, Dangriga, Corozal City, Belize City, Orange Walk
Settlement	30	Mahogany Heights and Cayo District
Isolated settlement	30	Toledo rural

#### Results

Belize City has the highest waste generation rates (Figure 1 below). Urban areas had more variance in waste volumes and types and generated more waste regardless of income levels. There was relatively wide variance of waste generation rates in poorer households.

**Figure 1: Waste generation rate by city**



Source: APWC 2019

Waste generation rates in commercial premises were calculated per employee. Urban areas have more types of commercial operations and each generates different types and volumes of waste. Supermarkets generated a large amount of paper and cardboard, hotels and restaurants generated the largest amount of food. By weight, organics, paper and cardboard and plastics make up more than 75% of the waste produced by commercial premises. Plastics were over 50% by volume. The higher the volume of waste, the higher the cost of transport, which is one of the largest costs.

Organics were over 40% of the volume of waste generated from households, 34% of waste from commercial sources, and 43% of street litter collection. Plastics were 17% of waste from households, 33% of street litter and 25% of commercial waste. Paper and cardboard waste were 24% of commercial waste; personal waste (tissue, diapers etc.) were 18% of household waste.

The organic wastes from households are mostly food. The plant matter is burnt or composted. Recyclable aluminum and steel cans make up most of the metal waste from households. The Returnable Containers Act<sup>10</sup> includes aluminum cans but only Bowen and Bowen plastic and glass bottles are regularly returned.

Single-use plastic waste is the greatest challenge to local landfills. The Bowen and Bowen plastic bottles are returned, but PET bottles still make up one fourth of the plastic waste found in garbage in Belize, followed by plastic bags (20%) and flexible films such as chip packets (20%).

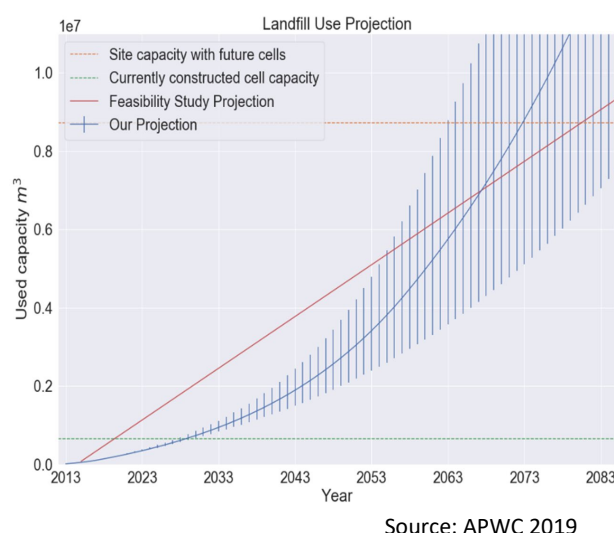
Urban Belizeans are satisfied with their collection services, but rural areas less so. Urban areas averaged four or five days between collections, rural communities averaged thirty days. In 2019 most garbage was

<sup>10</sup> The Returnable Containers Bill was gazetted on 29 August 2009. It provides that a deposit on beverage containers shall be collected by all distributors or retailers at the time of sale or distribution, that all retailers must redeem any empty beverage container of the design, shape, size, color, composition and brand sold by them, and that every person who contravenes this act shall be liable on summary conviction to a fine not exceeding \$500 or to imprisonment for a period not exceeding six months or to both a fine and imprisonment.

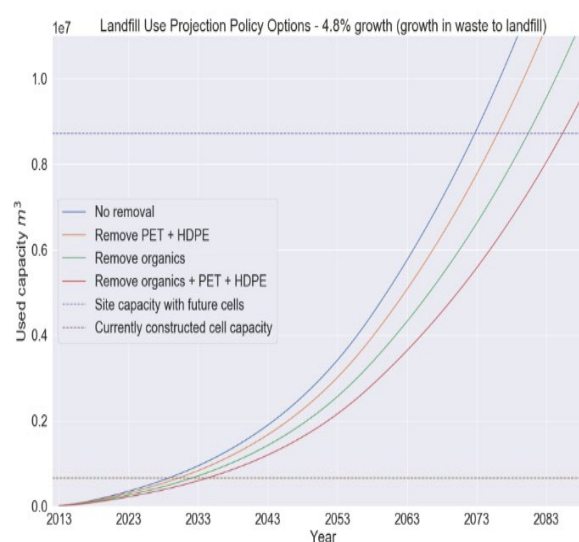


actually collected, a great improvement since 2010; 75% for Mahogany Heights, 100% for Dangriga, 100% for Corozal Town, 100% for Belmopan, 100% for Orange Walk and 100% for Belize City. In contrast, 60% of the waste in Bullet Tree Falls and 89% of the waste in Rural Toledo is burned. The landfill will be filled by 2063 (See Figure 2) (Based on household, not commercial waste).

**Figure 2: Landfill use projection**



**Figure 3: Landfill Use Policy Options Projections**



Compacting waste reduces the rate at which landfill space is consumed and reduces the number of trucks required for transport. If compacted without source separation, the volume being taken up will be reduced to less than half of the volume generated.

## Recommendations

- **Organics and plastics** should be separated at source.
- The **deposit system** should be extended to more products.
- **Recycling** would extend the lifespan of the landfill (see Figure 3 above).
- Improved education, outreach and stakeholder engagement will change attitudes.

## Outcomes of Discussions

The delegates agreed that it was not feasible for smaller Caribbean nations to develop advanced waste processing facilities, as individual countries only produce small amount of recyclable material and recommended a hub-and-spoke model for the region. This requires countries to assess their waste and identify the comparative advantages of each in processing different types of recyclable material (although the feasibility of transport is a critical factor).

A hub-and-spoke waste management model established under the CARICOM framework was suggested. This could include the design and implementation of an online system to search for information on types, quantities and availability of recyclable material. Delegates were also mindful that while the recommendation was highly favoured in theory, the feasibility of intra-regional transportation is another critical factor which must also be considered. No recommendation to address that challenge was put forward. However, delegates were encouraged to consider a revolving fund to support project sustainability.

## 4. Exploring opportunities of how sustainable waste management and recycling can support the ‘blue economy’

**Presenters:** Mr. Vincent Sweeney, *Head, Caribbean Sub-Regional Office, UNEP*

Ms. Emma Doyle, *Marine Protected Area Connect Coordinator, Gulf and Caribbean Fisheries Institute, USA*

This section highlights examples of where effective waste management has generated multiple benefits (created jobs and businesses, benefitted tourism, protected the environment etc.).

The ‘Blue Economy’<sup>11</sup> refers to ocean-based economic activities which are in tandem with environmental health. This requires a balanced approach to promote a sustainable, healthy ocean that can be of benefit both directly and indirectly. This encourages better stewardship of the ocean, marine and coastal resources. It is the core of the Commonwealth Blue Charter, highlighting the close linkages between the ocean and the wellbeing of the people of the Commonwealth. The concept encompasses fisheries, livelihoods linked to coastal tourism, the maritime sector (e.g. shipping, logistics and off-shore drilling)

---

<sup>11</sup> This is distinct from the ocean economy. The ocean economy consists mainly of ocean transport, tourism, and oil and gas production, often focused primarily on economic growth. The Caribbean’s estimated annual value of the ocean economy stands at US\$407 billion (Patil, et al., 2016)

and renewable energy (tidal, Ocean Thermal Energy Conversion (OTEC) etc.), with climate change as a cross-cutting issue. To ensure long term sustainability, there needs to be a comprehensive approach taken to the development of all these activities. This will require cohesive policy and sustainable management, with a shift away from an exclusive focus on economic growth towards a model of sustainable development. This shift turns the focus on enhancing the standard of living of the region through the creation of viable jobs, the promotion of the circular economy, poverty eradication, and the strengthening of the region's resilience to climate change, as it reconciles environment and development planning.

Building the blue economy is not limited to products which originate from the ocean. It includes all the rubbish which ends up on the coast and in the water. It is therefore important to take a circular approach to managing the litter component of the blue economy. It will require adopting a circular approach to managing the waste, beginning with the collection of marine and coastal debris, and preferably transforming them into useful products and thereby returning the materials into economically productive forms of use. Marine litter is largely characterised by lost or discarded fishing gear (ALDFG) and plastic bottles. Fishing nets, tires, and PET plastic bottles are among the most common recyclable materials in marine litter. Through the Global Ghost Gear Initiative, as described by the Gulf and Caribbean Fisheries Institute (GCFI), there is increased involvement by the fishing community in managing marine litter; through targeted training in gear retrieval and gear disposal, to solving the problem of what happens to fishing gear at the end of its life. This builds capacity at the local level, expands knowledge transfer, and provides targeted solutions through coordinated actions and networking. Examples of circular use include the use of plastic as moldings for art, glass into tiles, and the pulping and reuse of paper and cardboard as stationery. Practical examples include Waste3Work in St. Maarten and Nature Hand Made Paper in Jamaica.

Moving towards a circular blue economy would generate multiple gains. It would allow countries to prevent reusable materials from ending up in the landfill, raise awareness about sustainability, foster a cleaner, healthier ocean environment, improve the value of waste (now reconceived as an input in production), improve the relevant technical skills of the population, particularly, the young, empower communities, promote innovation and build entrepreneurs.

There is a Caribbean Node for the Global Partnership on Marine Litter (GPML). This focuses on ensuring a healthy Caribbean Sea, providing sustainable economic opportunities, and reducing the human and environmental risks from improper management of solid waste and marine litter. It represents a partnership for national and regional organisations, governments, research and technical agencies and individuals, who work together to reduce the quantity and impact of marine litter in coastal zones of the WCR. The Caribbean node of GPML is also supporting waste management reduction work with the Sandals Foundation, linking with livelihoods in Jamaica. This includes providing waste collection infrastructure for better waste separation. It is anticipated that this will permit start-up ventures for the sale of compost from waste.

The GCFI also promotes sustainable livelihoods. The focus in Belize is the provision of options for fishers and their families to help to reduce the pressure on legal fisheries and curtail illegal fishing. With support from GCFI and NOAA (since 2012), the Belize Audubon Society has administered 25 grants for small business development among fishing families associated with the MPAs they co-manage, with significant investment in business training for the grantees. They continue to work with the same network of new small local businesses to reduce the pollution they create. One particular problem encountered was the lack of readily available alternatives to plastic and styrofoam. The solution was to encourage customers to bring their own containers and providing starter kits of sustainable alternative packaging to the small businesses. These initiatives are having a major impact on the level of awareness of marine litter. The continued close collaboration with these grantees, and making them aware of the issues around marine litter, has cemented good relationships between the protected area managers and the community

GCFI also focused on an understudied area - the role of the near-shore environment and marine litter as potential habitat for *Aedes aegypti* mosquito, and a subsequent role in disease vectors and transmission. Using Puerto Rico as the case study, GCFI mapped the incidence of Zika virus and modelled habitat suitability for *Aedes aegypti*. This was compared with existing marine litter data from the Ocean Conservancy. Statistical analysis found a correlation between the relative density of marine debris (large debris in particular) and the incidence of Zika. This requires urgent follow-up with public health agencies, as the results suggest that regions suffering serious problems with mosquito-borne disease need to prioritise litter clean-up efforts in order to reduce the number of potential mosquito breeding areas.

GCFI, working with the St. Georges University in Grenada, also confirmed the presence of microplastics in the GI tract of all samples of demersal, semi-pelagic and pelagic species of commercially important fish (which has implications higher up the food chain). Based on this first study on microplastic contamination, GCFI created and disseminated factsheets for policy makers featuring these results and calling attention to the implications.

Further progress will depend critically on policy support, strong legislation, legal clarity and vigorous enforcement. The UN monitors the status of bans on plastic bags and styrofoam, for example, which is a useful basis for information-sharing in the region. GCFI works with marine natural resource managers in the Marine Protected Areas (MPA) Connect network to build capacity for high priority MPA management needs. The managers of 32 priority coral reef MPAs have reported that 65% of MPAs are not addressing sources of pollution, even those that affect them directly and only 20% are implementing any form of pollution control, indicating the importance of this outreach.

GCFI has a number of examples of best practices, concept notes and costings, delivered through the GPML. This includes one to reduce the voluminous quantity of waste generated during Trinidad's Carnival and another on finding opportunities in complex problems, such as the sargassum influx. With regard to the latter, the solution may lie in developing a renewable energy source utilising the bio-digestion of sargassum, but this would have to be combined with organic waste to help ensure even feed for the

system in times when the flow of sargassum subsides (nobody is yet doing this, so assistance on this point would be particularly valuable).

The Institute is also implementing an effort with the Caribbean Youth Environment Network which is focused on empowering youth to take positive action on marine litter. This will see coordinated campaigns at regional level and in five nations in support of the UN Clean Seas Initiative and an effort to standardise litter monitoring. It will launch this month, with the International Coastal Cleanup.

## Outcomes of Discussions

The presenters showcased existing success stories which formed the basis for the discussion which followed. Delegates were excited about the possibilities of:

- a) Participating in the Global Ghost Gear initiative
- b) Modeling the best practices of projects guided by the Global Green Growth Institute (GGGI).

## 5. Incubator for marine litter and waste management

**Presenter:** Mr. Martin Alegria, *Chief Environmental Officer, Department of Environment, Belize*

It is important to exploit Belize's micro-plastics lab and macro-plastic monitoring capabilities, the country's position in the region and national commitment to reducing marine litter to benefit the region. Under the CLiP programme, Belize has developed expertise and acquired laboratory equipment to carry out testing and monitoring of plastics in the aquatic and marine environment. Belize has consistently shown the political will to develop the required legislation, such as the phase-out of single-use plastics and the legislation mandating returnable containers. As a result, Belize already has a strong legal framework that can support an increased ambition to reduce marine litter. Belize's position as the bridge between CARICOM and Central America, as well as being Chair of the Alliance of Small Island States, along with its strong commitment to marine conservation (with over 30% of its territorial sea under protection) and a complete ban on off-shore oil exploration, makes it a leading candidate for hosting a regional incubator. Belize stands ready to share the country's ideas and experiences. A joint regional approach would allow for shared experiences, joint policy responses, the building of regional capacity in the study and analysis of microplastics in the marine environment.

## Outcome of Discussion

It was agreed that the collaboration between Cefas and the government of Belize, specifically DOE under CLiP has done the groundwork, allowing Belize to now be considered a leading candidate for hosting the regional incubator and providing training for regional counterparts. While this was the general consensus, there were concerns as to whether regional political leaders would have sufficient political will to give this initiative the necessary support. It was subsequently suggested that a successful regional approach could be built on the existing framework, thus strengthening the possible adoption of the concept.

## 6. Education and outreach: sharing best practices across the WCR

**Presenters:** Ms. Briony Coulson, *Head, Ocean and Plastic Pollution, Defra, London*

Ms. Amanda Acosta, *Executive Director, Belize Audubon Society*

Mr. Brandon Arevalo Canales and Mr. Ricardo Alcoser, *Scouts Association of Mexico and Belize*

Mr. Umberto Binetti, *CLiP Data Manager, Centre for Environment, Fisheries and Aquaculture Science, UK*

*This requires coordination between regional agencies and partners, and the forming of a consensus as to the next steps.*

The sustainable development goals (SDGs) state that the future development of society must move beyond a narrow focus on economic growth, as all humanity depends on the maintenance of core ecosystems. A UN report in 2016 projected that by 2050 there will be more plastic present in the ocean than fish<sup>12</sup>. A Yunga Tide-Turner Badge<sup>13</sup> was introduced to help raise awareness and motivation to change personal behaviour, encourage local activism, inspire communities and influence others. The initiative is part of UN Environment's Clean Seas campaign and the YUNGA Challenge Badges to mobilise a direct youth-led contribution to Sustainable Development Goals (SDGs) 14 and 15, *Life below water*, and *Life on land*. Examples of its success include Kenya, where Erica successfully trained 5,000 young people and got a waste collection system installed in Kisii, and Tanzania, where the scouts became champions for the recently introduced plastic bag ban.

---

<sup>12</sup> The report was produced by the World Economic Forum and the Ellen MacArthur Foundation, with analytical support from McKinsey and Company, as part of Project MainStream, a global, multi-industry initiative that aims to accelerate business-driven innovations to help scale the circular economy. It was financially supported by the MAVA Foundation.

<sup>13</sup> Developed in collaboration with United Nations agencies, civil society and other organizations, YUNGA Challenge Badges aim to raise awareness, educate and motivate behavioural change towards the SDGs. It is available to organisations such as the Scouts, Girl Guides, Junior Achievement and various universities.

In Belize, the Belize Audubon Society co-manages seven protected areas, working in 20 buffer communities. They are dedicated to the sustainable management of Belize's natural resources through leadership and strategic partnerships with stakeholders in order to achieve and maintain a balance between the needs of both people and the environment. They are involved in enhancing the development of Belize's natural resources through protected areas management, environmental education, advocacy, community development and research programmes. Their education and outreach campaign includes nature schools, school presentations, open days, bird/junior naturalist clubs, publications and summer camps. The Society's practices have education as the foundation of the programmes as it believes that education is at the heart of environmentally responsible development. They work alongside communities, utilising locally generated research data to incite environmental stewardship in the society. In doing so, they empower residents in buffer communities of protected areas to become better environmental stewards.

Additionally, the Scouts Association of both Mexico and Belize work extensively to support nature. Nature is central to Scouting, representing one of their eight key elements. Their youth programme, directs young people to find creative and innovative ways to contribute towards sustainable development at all levels, whether individually or through collective activities. The organisation works to inspire its members to take consistent action on issues, taking advantage of information and communication technologies to share their actions and inspire others. One of their initiatives, the World Scout Environment Programme, offers tools, resources, activities and initiatives for all ages to help scouts establish a holistic awareness of the natural world. The principal lines of action are clean water and air, native species, the risk of harmful chemicals, carbon emissions and how people can be prepared to respond to the environmental hazards and natural disasters. Another such initiative is the Scouts4SDGs initiative which was launched at the World Scout Conference in 2017. This provides an opportunity for young people to leverage the Scout Youth Programme and the Movement's initiatives to raise awareness and take action towards the SDGs. Similarly, the movement creates social awareness for solid waste management, recycle and safe environments for children and youth, within the framework of the 2030 Agenda of the United Nations.

## **Outcome of Discussion**

Stakeholders have identified the need for increasingly coordinated communication efforts to tackle marine litter. Education and outreach are essential to the sustainability of any initiative, especially one focused on behavioural change. The discussions identified the need for collaborative work in the education and outreach process. It was suggested that without collaboration, there is duplication of efforts and the outcome may therefore not be the most efficient use of limited resources.

## 7. Financing the response to marine litter

**Presenters:** Mr. Martin Alegria, *Chief Environmental Officer, Department of Environment, Belize*;  
Ms. Ilona Drewry, *Head of International Engagement on Marine Litter, Defra, London*  
Ms. Briony Coulson, *Head, Ocean and Plastic Pollution, Defra, London*  
Mr. Gilroy Francis Lewis, *Water and Sanitation Specialist, Inter-American Development Bank*.

It is important to identify the need for - and availability of - funding in order to focus plans for action and cooperation. Belize identified a number of potential sources for funding, including:

1. STAR allocations of the GEF 7 funding period.
2. Caribbean regional GEF 7 Chemicals and Waste project. This can be adjusted to address national and regional priorities.
3. Bi-lateral initiatives with supporting countries or entities, namely the European Union, Japan/JICA, Germany/GIZ, and the CARICOM Secretariat; and
4. National sources in the form of an environmental tax and the Protected Areas Conservation Trust Fund.

Opportunities for assistance are also available through CCOA. Through the Commonwealth Blue Charter action group on marine plastic pollution (co-chaired by the UK and Vanuatu), members are called upon to pledge action on plastics, be this by a ban on microbeads, a commitment to cutting down on single use plastic bags, or other steps to eliminate avoidable plastic waste. Under the CCOA Technical Assistance Facility, £10 million has been committed by the UK government to provide technical assistance to Official Development Assistance (ODA) eligible CCOA members.

Since the 2018 Commonwealth Heads of Government Meeting, the UK has committed up to £70m of funding to address both land and sea-based sources of marine litter; relevant aspects of the funding are detailed in the below paragraphs. The goal is to build Commonwealth partnerships focused on strengthening regulation and governance, investing in science, innovation and research, engaging businesses and the private sector, and empowering young people.

With a budget of £25m, the Commonwealth Marine Plastics Research and Innovation Framework will provide a platform and overarching structure for bringing together governments, industry, researchers and practitioners from across the Commonwealth to work together to address the problem of marine plastic litter. The initiative will comprise both new jointly-funded interdisciplinary research and innovation programmes developed through the framework and activities developed and delivered by partnering countries and organisations. An important aspect of the framework will be providing a forum for sharing research plans and emerging findings with all partners, increasing coordination and adding value to



individual programmes. The framework will also support the development of links between researchers and innovators across the Commonwealth, supporting new partnerships and strengthening capacity.

The UK government, through Defra, has committed £2.4 million of funding routed through the World Economic Forum to support the Partnership to 2020. The initiative has since received matched funding from the Canadian government, and funding from PepsiCo, Coca-Cola and Dow Chemicals. This investment will support the delivery of ambitious goals under CCOA. The partnership provides a public-private collaboration platform to help translate political commitments to address plastic pollution into tangible strategies and investible action plans. The outputs will include a global plastics collaboration platform; support for national action partnerships to develop fact-based action plans; mobilising funding for plastics action projects; engaging and leveraging existing expertise among partners; exchanging knowledge, and learning to advance systemic change.

## Outcomes of Discussion

Delegates all agreed on the need for financing, with the following avenues highlighted as possible sources for moving forward.

- a) Using the IDB lab supported PRF in the Bahamas (one of the proposals selected under the Blue Tech Challenge mentioned earlier). This facility is intended to develop an innovative use of cavitation technology for the management and disposal of liquid and solid waste to MARPOL PRF standards.
- b) UNDP Accelerator Labs (Caribbean locations include Barbados and the Dominican Republic). The UNDP together with core partners, the State of Qatar and the Federal Republic of Germany will establish 60 labs serving 78 countries who will work together with national and global partners to find new approaches that fit the complexity of current development challenges. The emphasis is on evidence and practice and by accelerating the testing and dissemination of solutions within and across countries to improve sense-making, collective intelligence, solutions mapping and experimentation.
- c) IDB Invest finances sustainable enterprises and projects to achieve financial results that maximise social and environmental development for the region. It is owned by its 45 member countries, 26 of which are in the Latin American and Caribbean region.
- d) IDB Blue Tech Challenge - The IDB through its Multilateral Investment Fund (MIF), Natural Capital Lab, Sustainable Islands Platform and in alliance with the Compete Caribbean Partnership Facility, which is also supported by DFID, CDB and the government of Canada, will identify firms and organisations looking to pilot and scale up business models that use cutting edge technologies to contribute to the sustainable management of ocean, marine ecosystems and coastal resources.
- e) IDB Sustainable Islands Platform helps island territories pursue sustainability and climate-resilient investments. The Platform will benefit 11 Caribbean Basin island states and continental countries whose territory includes islands: The Bahamas, Barbados, Belize, Costa Rica, Dominican Republic, Haiti, Honduras, Jamaica, Nicaragua, Panama, Trinidad and Tobago. The platform promotes

economic growth and climate-resilient investments through an innovative approach that applies the principles of the blue and circular economic models.

## 8. World Café Action Stations

Participants were invited to participate in the World Café by sharing ideas on how to proceed as a region in addressing marine litter. Using Belize's MLAP, with the existing work done in Belize as a stepping stone, the World café presented an opportunity for key recommendations to be documented. They represent the possibility for the Caribbean region to build the necessary capabilities for managing and reducing marine waste. Delegates rotated among the six action stations that were established and produced the following recommendations from each station.

### 8.1 Monitoring and Ongoing Science

Given the region's capacity and financial constraints, countries need to collaborate to address regional marine waste. It was recommended that countries needed to review the network of laboratories in the region to determine existing capabilities, as well as identify reference laboratories for best practices. Table 8.1 below represents a summary of their discussion.

**Table 8.1: Suggested steps to developing regional marine litter science**

Recommendation	Supporting activities required and/or explanation
Coordinated approach recommended	Establish common set of protocols for measuring and monitoring
	Establishes standards and accuracy
	Strengthened institutional and financial capacity regionally for managing scientific research and data.
Employing Citizen Science - members of the public participate in the collection and analysis of data, working with professional scientists.	In areas such as enhanced data collection, beach cleaning and lobbying.
	Encourages involvement and reduces research costs.
	Has the added advantage of immediate information sharing, which makes the process an excellent educational opportunity - people see science in action.

### 8.2 Eliminate Sea-based litter

Delegates suggested that a regional approach was needed to address sea-based litter. Table 8.2 represents the suggestions that were highlighted.

**Table 8.2: Suggested activities for addressing sea-based litter**

Activity	Description
Building capacity	Building regional capacity for gear retrieval and marketing of further products, including training the trainers.
Utilise partnerships	Using existing networks such as GCFI GPML to conduct feasibility study on gears retrieved to determine any possible economic use.

### 8.3 Regulation and Legislation

Regulation and legislation were considered of primary importance to the success of any initiative. Delegates identified key variables within this area as education, legislation, alternatives, as well as the need to continuously look ahead. Table 8.3 below outlines the main characteristics of each such variable as described by the delegates.

**Table 8.3: Key variables identified in regulation and legislation**

Key Variables	Characteristics
Education	Soft approach
	Aimed at behavioural change
	Needs clear communication
Legislation	Single use plastic ban
	Phased implementation approach – allowing time for transition
	Requires enabling regulation
	Enforcement plans
Alternatives	Create standards
	Clear labelling including life cycle analysis
	Promote reusables
Next steps	Knowledge and experience sharing
	Multi sectoral consultation process including private sector involvement
	Review other programmes
	Consider possible opportunities

### 8.4 Port Reception Facilities and Shipping Waste

Delegates suggested that the following actions, presented in Table 8.4 below, were needed to address the current situation.

**Table 8.4: Recommended activities for treating with shipping waste**

Approach	Steps required
----------	----------------

Regional	Develop and implement marine pollution-prevention legislation to address waste from sea-based sources (maritime sector and port facilities) and marine litter in the marine environment in Belize, among other marine pollution issues.
	Develop and implement a waste reduction policy and a recycling policy for each sector, legislation to formalise and standardise waste management (collection and disposal), promote the development and strengthen of a recycling sector (inclusive of source separation) and reduce marine litter generated at source.
	Work towards building capacity in Belize through the DOE to focus on creating, demonstrating, and testing scientific and technical ideas and concepts to reduce marine litter.

## 8.5 Regional Cooperation for regional solid waste management

Solid waste management is a major challenge for the region. Increased generation of solid wastes from land and marine-based sources and the slow rate of degradation of many discarded materials, particularly plastics, result in an increase in marine litter at sea, on the sea floor and on coastal shores. Delegates suggested that the following actions, presented in Table 8.5 below, were needed to address the current situation.

**Table 8.5: Recommended activities to address regional solid waste management**

Responsible party	Steps required
Individual countries	Determine the pre-packaging requirements of recyclables (i.e. baled, crushed, shredded, palletised and so on).
	Assess the marketability of recyclable material and the associated items considered for production.
Regional	Assess the quality and composition of land-generated waste
	Identify the comparative advantages of facilities in processing different types of recyclable material.
	Under the CARICOM framework, design and implement an online system to search for information on types, quantities and availability of recyclable material.
	Establish a regional association of recyclers.
	Establish a regional recycling authority to set and monitor standards, as well as perform governing functions such as establishing a minimum price.
	Implement a modern communication strategy to raise awareness of the problems across the region, with standardised branding and messaging as far as possible to avoid having to develop a separate strategy for every individual country.

## 8.6 Outreach and Education

The delegates agreed that sustained education programmes were needed if the region was to achieve the objective of changing consumer behaviour towards single-use plastic and exercise proper environmental stewardship. It would require countries to develop and implement a coordinated and sustained long-term outreach campaign across multiple sectors and audiences, addressing marine litter and waste management to encourage behavioural change in waste management, disposal and understanding of marine litter and the associated impacts on the people of Belize, the marine environment and the region.

Table 8.6 identifies some of the key variables identified by the station.

**Table 8.6: Suggested key variables to outreach and education**

Variables	Description
Characteristics of the desired communication	Sustained
	Aimed at multi-level audiences, such as young people, adults, professionals, communities and businesses
	Targeted messaging
	Messages structured to achieve objectives
	Information should be science based and accurate
	Partnerships – NGOs, Scouts, Media
Obstacles to effective communication	Low communications budget
	Expensive airtime
	Some messages are not designed to reach all members of the society, resulting in some communities being disenfranchised
	Misinformation
	Information overload
	Ocean cleanup seen as an end in itself
Recognise trends, realities and context	Appeal to peer pressure and influencers (musician, athletes) to share the message
	Lower the importance of the traditional media
	Good messaging goes viral
	Keep information current
	Utilise digital platforms
	Encourage research and development
	Promote innovation

## 9. Going Forward

The key is to map the various ways forward for the region to coordinate between states, regional agencies and international partners.

No additional policy pledges were made. However, delegates agreed that the following points were of critical importance in the next phase of addressing the regional problems with marine litter:

- A multi-sectorial approach.
- A regional coordination of efforts.
- Build regional capacity.
- Policies based on facts, evidence-based decision making.
- Reviewing, monitoring and evaluating progress.
- Testing and demonstrating ideas and concepts for addressing the problem of marine litter and improving waste management.
- Determine how much marine pollution is land-based and address it at source.
- Coordinate and tap into complementary skills.
- Develop the science around testing for possible linkages between human health and the consumption of marine life with microplastic in their system.

## OUTCOME STATEMENT

### HIGH-LEVEL DIALOGUE ON MARINE LITTER AND WASTE MANAGEMENT IN WIDER CARIBBEAN REGION

We, the participants of the high-level dialogue on Marine Litter and Waste Management in the Wider Caribbean Region, having met in Belize from 05 September to 06 September 2019;

**Recognise** the negative impacts posed to the marine environment from marine litter and microplastics that threaten the health of marine life, erode the quality and safety of fishery commodities, and contribute to the degradation of fragile ecosystems that support rich biodiversity and sustains the livelihoods and economies of the countries and potential impacts on human health within the Wider Caribbean Region;

And **Recognising, Accepting** and **Building upon** the work of the UN Environment Caribbean Regional Coordinating Unit in the updating the Regional Action Plan for Marine Litter (RAP Mali) for the Wider Caribbean Region (WCR) 2014;

Further **Recognising** the continued work of the United Nations Environment Programme – Caribbean Environment Programme (UNEP – CEP), the Gulf and Caribbean Fisheries Institute, and the Global Partnership for Marine Litter (GPML) and other networks at the regional level;

Now collectively agree to the following:

1. **Acknowledge** that scientific monitoring and evidence-based decision making is instrumental in charting actions to address marine litter and microplastics;
2. **Acknowledge** that marine litter is generated from both land-based and sea-based sources;
3. **Acknowledge** that sustained outreach and education is vital to ensuring long-term behavioural change to reduce and eliminate marine litter, especially from single-use plastics and improving waste management;
4. **Acknowledge** the need for commitment, nationally and regionally, to coordinate and work towards addressing the growing concern through the promotion and coordination

of projects at the local, national and regional level to address marine litter and microplastics and waste management;

5. **Acknowledge** the progress made by countries in the Wider Caribbean Region to address marine litter and improve waste management and further acknowledges the effort of Belize to formalise a national policy to address marine litter through the development of their Marine Litter Action Plan: Belize- Blue, Clean, Resilient and Strong and through continued projects to strengthen waste management at the national level;
6. **Acknowledge** South-South Cooperation through the concept presented by Belize to share their experience regionally with sister Caribbean and Central American countries through an 'Incubator' programme to test and demonstrate best practices, concepts and actions to reduce and eliminate marine litter, provide training and capacity building for microplastics survey, testing and analysis via establishment of a microplastics laboratory, provide training in microplastic analysis and macroplastic beach monitoring, and development of outreach and education materials;

**Express appreciation** to the government of United Kingdom for supporting the Commonwealth Litter Programme as part of the commitment under the Commonwealth Clean Ocean Alliance and Commonwealth Blue Charter, and the government and people of Belize for hosting this high-level dialogue to discuss the growing issue of marine litter and waste management within the Wider Caribbean Region.

Belize, 06 September 2019



## References

Barne, D. and Pirlea, F. (2019). *Caribbean beaches are littered with single-use plastics*. [Online] Available at: <https://blogs.worldbank.org/opendata/caribbean-beaches-are-littered-single-use-plastics>.

Belize Tourism Board, (2018). *Travel and Tourism Statistics Digest*, s.l.: Belize Tourism Board.

Food and Agriculture Organization of the United Nations, 2018. *Fishery and Aquaculture Country Profiles*. [Online] Available at: <http://www.fao.org/fishery/facp/BLZ/en> [Accessed September 2019].

Green, C. and Jobling, S. (2018). *A Plastic Ocean: The Science behind the Film*, London: Brunel University.

International Union for Conservation of Nature. (2018). *International Union for Conservation of Nature Issues Brief*. Gland: s.n.

Lebreton, L. C. M., van der Zwet, J., Damsteeg, J. W., Slat, B., Andrady, A. and Reisser, J. (2017). River plastic emissions to the world's ocean. *Nature Communications*, 07 June.8(15611).

National Geographic Society, n.d. *Great Pacific Garbage Patch*. [Online] Available at: <https://www.nationalgeographic.org/encyclopedia/great-pacific-garbage-patch/12th-grade/> [Accessed 12 September 2019].

Oceana (2003). *Around 3,000 cases of illegal dumping of hydrocarbons in european seas are reported every year. Press release 03 December 2003. Madrid*. [Online] Available at: <https://eu.oceana.org/en/press-center/press-releases/around-3000-cases-illegal-dumping-hydrocarbons-european-seas-are> [Accessed 17/04/2020].

Patil, P. G., Virdin, J., Diez, S. M., Roberts, J. and Singh, A. (2016). *Toward a Blue Economy: A Promise for Sustainable Growth in the Caribbean*, Washington D.C.: World Bank Group. Available at: <https://openknowledge.worldbank.org/handle/10986/25061> [Accessed 17/04/2020].

United Nation Environment Programme. (2018). *Marine litter in the Ocean*. [Online] Available at: <http://cep.unep.org/unep2019s-caribbean-environment-programme-reminds-of-the-deadly-impact-of-marine-litter-on-the-ocean>

United Nations Conference on Trade and Development. (2017). *Evidence-based and policy coherent Oceans Economy and Trade Strategies. Sector data factsheet: Belize*, s.l.: Marine Fisheries.

United Nations Environment Programme. (2018). *Single-Use Plastics: A Roadmap for Sustainability*: United Nations Environment Programme. Available at: <https://www.unenvironment.org/resources/report/single-use-plastics-roadmap-sustainability> [Accessed 17/04/2020].

## Appendix 1

### Programme

## High-Level Dialogue on Marine Litter and Waste Management in the Caribbean Region

Wednesday 04 – Friday 06 September 2019

Best Western Belize Biltmore Plaza, Belize City.

In partnership the Ministry responsible for Environment, Department for the Environment, CLiP, Cefas, Defra and the British High Commission Belize

### Wednesday 04 September

1745-1900

Plated Belizean Dinner

**Plated dinner served at 1800**

Please arrive at the Toucan Hall, Best Western Belize Biltmore Plaza, Belize City at 1745 in order to be seated for dinner which will be served at 1800.

1900-2000

Cultural evening with dancing and music from different Belizean Ethnic Groups

1. Maya Dance by Belize National Dance Company
2. Garifuna dance with live drumming by Ugundani Dancers
3. Mestizo Dance by Yo Creek Dancers
4. Live Marimba Music
5. Creole Dance by Belize National Dance Company
6. Di Maroonz Drummers

### Thursday 05 September

0830-0900

Registration

At the entrance to River Hall, Best Western Belize Biltmore Plaza

0900-0945

Welcome and introduction

**Master of Ceremony:**

**Mr Dorian Pakeman**

Director, Government Press Office, Belize

	<p>Belize National Anthem</p> <p><b>Welcome:</b>  <b>Honourable Dr Omar Figueroa</b>  Minister of State, Ministry of Agriculture, Fisheries, Forestry, Environment, Sustainable Development and Immigration, Belize</p> <p><b>Her Excellency Ms Claire Evans OBE</b>  British High Commissioner, Belize</p> <p><b>Video message:</b>  <b>The Honourable Mr Zac Goldsmith MP</b>  Parliamentary Under-Secretary of State for Environment and International Development, United Kingdom</p>
<b>0945-1030</b>	Group photograph, refreshments and media interviews
<b>1030-1040</b>	<p>Introducing the Commonwealth Blue Charter</p> <p><b>Ms Briony Coulson</b>  Head, Ocean and Plastic Pollution, Department for the Environment and Rural Affairs (Defra), United Kingdom</p>
<b>1040-1115</b>	<p>Introducing CLiP</p> <p><b>Mr Thomas Maes</b>  Cefas Principal Marine Litter Scientist and the CLiP Principal Investigator, Centre for Environment, Fisheries and Aquaculture Science (Cefas), United Kingdom</p> <p><b>Mr Peter Kohler</b>  Senior Marine Litter Scientist and Country Lead, CLiP Belize, Centre for Environment, Fisheries and Aquaculture Science (Cefas), United Kingdom</p> <p><b>Ms Maxine Monsanto</b>  Environmental Officer, Department of the Environment, Belize</p>
<b>1115-1200</b>	<p>Developing marine litter science: toward better monitoring, enforcement and harmonisation of marine litter across the Wider Caribbean Region (WCR)</p> <p>Using Belize's Marine Litter Action Plan and Harmonising Marine Litter Monitoring in the WCR: A Hybrid Approach as a starting point, this session will explore opportunities to find solutions to shared challenges to improve monitoring, enforcement and harmonisation marine litter across the WCR.</p> <p><b>Co-chair:</b>  <b>Professor Stuart Rogers</b></p>

Chief Scientist, Centre for Environment, Fisheries and Aquaculture Science (Cefas), United Kingdom

**Mr Peter Kohler**

Senior Marine Litter Scientist and Country Lead, CLiP Belize, Centre for Environment, Fisheries and Aquaculture Science (Cefas), United Kingdom

**Dr Abel Carrias**

Assistant Professor, University of Belize

**Mr Vincent Sweeney**

Head, Caribbean Sub-Regional Office, UN Environment, Jamaica

**1200-1300**

**Addressing sea-based sources of marine litter: coordinating action on auditing of ship generated waste across the WCR.**

Exploring opportunities to coordinate and improve national auditing and enforcement of ship generated sources of Marine Litter by sharing knowledge, data, and practices across the WCR.

**Co-chair:**

**Mrs Sherlett Martinez**

Assistant Ports Commissioner, Belize Port Authority, Belize

**Dr Amardeep Wander**

Project Director, Asia Pacific Waste Consultants (APWC), Australia

**LT CDR Floyd Patterson**

IMO Consultant, RAC/REMPEITC-Caribe, Curaçao

**Mr Martin Alegria**

Chief Environmental Officer, Department of the Environment, Belize

**1300-1400**

Lunch

**1400-1445**

**Addressing land-based sources of marine litter: coordinating and sharing waste management and recycling capabilities across the WCR.**

Exploring land-based sources of marine litter, building on RAC-REMPEITC Report (2018), and investigating 'hub and spoke' type model as in the South Pacific.

**Co-chair:**

**Ms Briony Coulson**

Head, Ocean and Plastic Pollution, Department for the Environment and Rural Affairs (Defra), London

	<b>Mr Juan Polanco</b> Private Sector Representative to the Belize Solid Waste Management Authority, Belize
	<b>Dr Amardeep Wander</b> Project Director, Asia Pacific Waste Consultants (APWC), Australia
<b>1445-1600</b>	Break
<b>1600</b>	Participants depart for Belmopan (journey time approx. 1 hour 15 mins)  Meet in reception of Best Western Belize Biltmore Plaza for transport to Belmopan.
<b>1730-2030</b>	British High Commission reception featuring Beating of Retreat by Corps of Drums 1st Battalion Grenadier Guards.
<b>2030</b>	Participants depart for Belize City

## Friday 06 September

<b>0900-0930</b>	Keynote speech <b>Mr Salvador Nieto</b> Executive Secretary, Secretariat for the Central American Commission for Environment and Development (CCAD), Central American Integration System (SICA), El Salvador
<b>0930-1000</b>	<b>Exploring opportunities for targeted and coordinated actions to sustainably reduce negative impacts of marine litter and support growth of the blue economy across the Caribbean.</b>  Ocean have an important socio-economic role, often framed under the term: 'blue economy', which covers sectors such as coastal tourism, fisheries, oil and gas extraction, wind/wave energy, biotechnology and maritime transport. In recent years, ocean pollution from plastics has been high on policy-makers' agendas. This session will explore and discuss opportunities solutions across sectors that could reduce or remove the negative impacts of marine litter on blue economy activities.  <b>Co-chair:</b> <b>Mr Rickardo Ward</b> Climate Change Coordinator, Ministry of Maritime Affairs and the Blue Economy, Barbados

**1000-1030**

**Mr Vincent Sweeney**

Head, Caribbean Sub-Regional Office, UN Environment, Jamaica

**Ms Emma Doyle**

MPA Connect Coordinator, Gulf and Caribbean Fisheries Institute, USA

Coffee break

**1030-1100**

**Incubator for marine litter and waste management**

This session will discuss how best to exploit Belize's microplastics lab and macroplastic monitoring capabilities, its position in the region and national commitment to reducing marine litter to benefit the region.

**Co-chair:**

**Professor Stuart Rogers**

Chief Scientist, Centre for Environment, Fisheries and Aquaculture Science (Cefas), United Kingdom

**Mr Martin Alegria**

Chief Environmental Officer, Department of the Environment, Belize

**1100-1200**

**Education and outreach: sharing best practices across the WCR**

How to ensure coordination between regional agencies and partners, gather consensus on next steps.

**Co-chair:**

**Mr Reginald Burke**

Executive Coordinator, Caribbean Youth Environment Network, Barbados

**Ms Briony Coulson**

Head, Ocean and Plastic Pollution, Department for the Environment and Rural Affairs (Defra), London

**Ms Amanda Acosta**

Executive Director, Belize Audubon Society, Belize

**Mr Brandon Michel Arévalo Canales**

Scouts Association of Mexico

And

**Mr Ricardo Alcoser**

Senior Field Executive, The Scout Association of Belize

**Dr Umberto Binetti**

Marine Litter Data Analyst / CLiP Data Manager, Centre for Environment, Fisheries and Aquaculture Science (Cefas), United Kingdom

**1200-1300**

Lunch

**1300-1345**

### Financing the response to marine litter

This session will look at the needs and availability of funding to attain the action and cooperation discussed in previous sessions.

#### Co-Chair:

##### **Mrs Amanda Acosta**

Executive Director, Belize Audubon Society, Belize  
And

##### **Ms Ilona Drewry**

Head of International Engagement on Marine Litter, Department for the Environment and Rural Affairs (Defra), London

##### **Mr Martin Alegria**

Chief Environmental Officer, Department of the Environment, Belize

##### **Ms Briony Coulson**

Head, Ocean and Plastic Pollution, Department for the Environment and Rural Affairs (Defra), London

##### **Mr Gilroy Francis Lewis**

Water and Sanitation Specialist, Inter-American Development Bank (IDB), Washington DC, United States of America

**1345-1400**

Coffee break

**1400-1500**

### World Café

During this session, participants will have the opportunity to break into smaller groups to discuss key questions that have arisen over the previous two days' discussions.

**1500-1550**

### Next steps and policy pledges

Mapping ways forward for the region to coordinate between states, regional agencies and international partners

#### Co-chair:

##### **Ms Beverly Wade**

Fisheries Administrator, Belize Fisheries Department, Belize

##### **Mr Martin Alegria**

Chief Environmental Officer, Department of the Environment, Belize

**1550-1600**

Closing



1600

Participants depart