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Commonwealth Litter Programme - Belize

Marine Litter Education Report

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Issue Date: 08 April 2020



Cefas Document Control

Submitted to:	UK Department for Environment, Food and Rural Affairs, Belize Department of the Environment
Date submitted:	08 April 2020
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Version:	4

Version Control History			
Version	Author	Date	Comment
V1	Bryony Meakins, Maija Marsh & Emma Novak	October 2020	Draft 1 created
V2	Bryony Meakins	January 2020	QC Peter Kohler
V3	Bryony Meakins, Umberto Binetti	March 2020	QC Peter Kohler
V4	Umberto Binetti, Bryony Meakins	April 2020	Final

Executive Summary

Education surrounding marine litter forms a crucial part in helping to bring about change in behaviour and avoid litter entering the marine environment, which is why science and education forms one of the key pillars in the Commonwealth Litter Programme (CLiP). CLiP has developed marine litter educational packs to be used in schools and communities to raise awareness of marine litter in Belize and around the world, highlighting how day to day actions can help tackle this important issue. The contents of these packs were developed for Belize in partnership with the Department of Environment and the Ministry of Education and with input from a wide range of private, education and government stakeholders and Non-Governmental Organisations (NGOs). Education traditionally covers formal institutions such as schools and colleges, but also informal settings such as out of school activities and knowledge shared in family and community groups. NGOs play an important role in environmental stewardship in Belize, and this extends to environmental education. CLiP engaged early with organisations such as the Scouts Association of Belize and the Audubon Society to help ensure the maximum reach of the resources produced. Marine litter education is considered highly important in Belize, with stakeholders placing this activity as the top priority to tackle marine litter in Belize at the Best Practise Workshop, held in Belize City on 5 June 2019, and during the Targeted Stakeholder Workshops, held in Belize City between 1 and 4 July 2019. Motivation is high within local NGOs and government organisations to carry out education around marine litter and waste management, and the mapping exercise of the educational packs to the Belizean curriculum has been taken onboard by officers in the Ministry of Education. The mapping of the marine litter educational resources to the Belizean curriculum and roll out into schools was included in the Belize Marine Litter Action Plan (MLAP), ensuring that the Ministry of Education has the justification to continue work to this effect.

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1 Introduction

The development of a marine litter tool kit is a key deliverable of the Commonwealth Litter Programme (CLiP). Education is a vital tool in equipping future generations with the right knowledge to make effective decisions on issues surrounding marine litter and appropriate waste management (Vince & Hardesty, 2018). The importance given to education also aligns with the Belize Marine Litter Action plan (MLAP) and the tools developed as part of CLiP provide the stakeholders with a useful resource to facilitate these actions.

Programmes working to tackle marine litter, that include education in schools, increase knowledge and improve environmental behaviour in children (Hartley et al., 2015; Veiga et al., 2016). Experimental education, such as carrying out a beach litter survey, is likely to have a positive effect on participants' attitudes and behaviours towards marine litter (Owens, 2018; Rayon-Viña et al., 2019). Educating younger generations can also have the additional effects of changing the behaviours and attitudes of the older generations, through at-home dialogue between children and their older family members (Damerell et al., 2013). Curriculum change has also been identified as the most likely factor to influence changes in the teaching and learning process (Hacker and Rowe, 1997). Based on these insights, in collaboration with the Department of the Environment (DOE) and the Ministry of Education (ME) of Belize, the Centre for Environment, Fisheries and Aquaculture Science (Cefas) developed under CLiP an education toolkit on marine litter to supplement and complement Belize's existing curriculum (Cefas, 2019). A set of primary and secondary education packs and toolkits were developed as a result, which the ME agreed to adopt into the national curriculum.

Figure 1.1 shows the enrolment rates of children from pre-school to University between 2017 and 2018 (PPRE, 2018). In 2017-18, 88%¹ of children enrolled in primary school education, which dropped to 62.4%¹ of the corresponding population continuing onto secondary education (PPRE, 2018). This highlights that the key age group to engage lies within primary schools to reach the highest proportion of the population in education. While English, Spanish and Belizean Creole are all commonly spoken languages in Belize, the official language used by the government and schools is English and it was reported that in contrast to older generations, almost all children in Belize speak English (pers. comm.).

Environmental NGOs are very active in providing environmental protection to important species and habitats in Belize and in addition are instrumental in providing environmental education. Education outside of schools forms another important method of bringing about change in behaviour, and some studies suggest that this is more effective than formal education (Filho, 1994). Belize has a relative high church attendance and a variety of active community groups and kids' clubs, all of which can provide effective alternative routes for delivering education.

¹ Gross enrolment rate

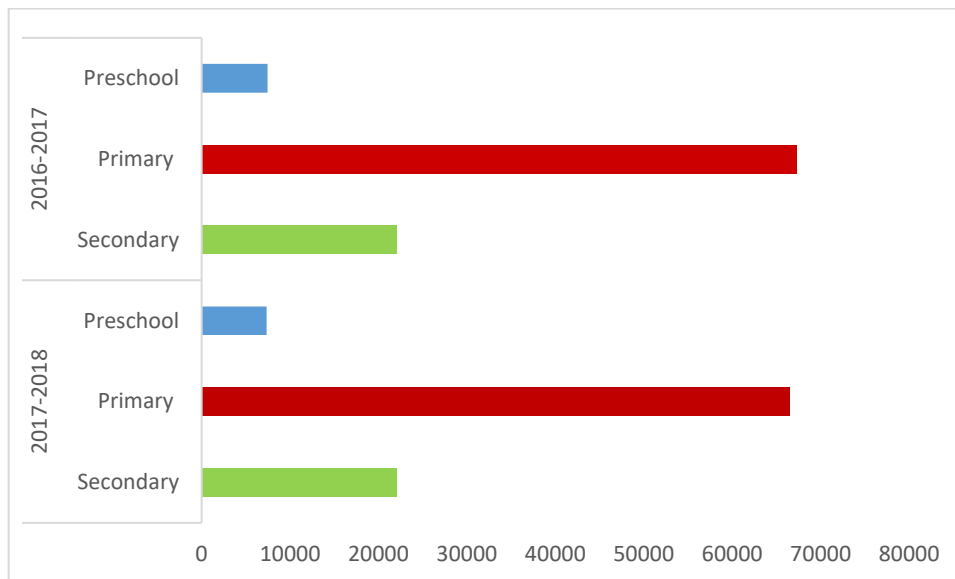


Figure 1.1. Enrolment in Belize by level from 2016-17 to 2017-18. Data from PPRE, 2018.

2 Materials and methods

Figure 2.1 shows the approach taken to develop and deliver marine litter educational resources in CLiP. These stages are explained further under the headings below.

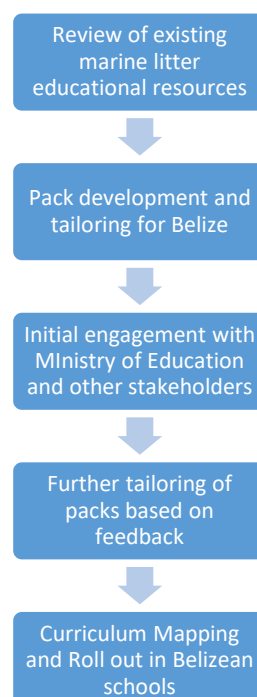


Figure 2.1. Overview of Process Taken to Develop and Roll-Out CLiP Marine Litter Education Packs in Belize.

2.1 Review of pre-existing resources

A catalogue of existing educational resources on marine litter available online was created in September 2018 at the start of CLiP. These resources covered a wide age range and were developed in different geographical regions. This catalogue forms a useful library of resources and formed the basis for the educational tool kit for CLiP (Table 2.1).

Table 2.1. Catalogue of existing marine litter educational resources

Name	Source	Age Range
Australian Marine Debris Initiative	Australian Marine Debris Initiative Education Kit	F-3 (ages 4-8), 4-6 (ages 8-11), 7-10 (ages 11-16)
British Science Week 2018 activity Packs	British Science Week 2018 Activity Packs	EY (age 4-5), Primary (ages 5-11), Secondary (ages 11-16)
EU	Would you drink your wastewater? A water brochure for young people	
Global Ocean	Plastic Not Fantastic, The story of Plastic Pollution in Our Ocean	Activities for ages 4-11+
NOAA	Turning the Tide on Trash	K- grade 12
	From Shore to State House: Marine Debris Undergraduate Course Materials	Undergraduate
	Hawai'i Wildlife Fund: Marine Debris Keiki Education and Outreach (MDKEO) Program	K- grade 5
	Marine Debris Toolkit for educators	
	An Educator's Guide to Marine Debris	K-Grade 12
	Nature's Academy - The Science Literacy Project Standards-Based Curriculum	
	MARINE DEBRIS - Composition and Abundance	Grades 4-5
	Save Our Seas	K-12
	Talking Trash and Taking Action	
	Educator's Guide to Marine Debris in the Southeast and Gulf of Mexico	Grades 5-8

	Washed Ashore Integrated Arts Marine Debris Curriculum	Grades 5-8
SOEST Hawaii	Center for Microbial Oceanography: Research and Education C.More Science Kits	Grades 8-12
Wisconsin Green Schools Network	Wee Recyclers	Ages 3-5

2.2 Pack Development and tailoring for Belize

The materials listed in section 2.1 were reviewed, and lesson topics developed around three main themes (which were commonly found across the existing resources shown in Table 2.1): 'What is marine litter?', 'Marine litter in country', and 'Solutions to the marine litter problem'. An extra lesson was added for older children (ages 11+): Exploring the global issue of marine litter. Suitable activities were identified and developed to accompany the lesson topics, with extensions suggested for older children within the age group. The packs were aimed for teachers to provide ideas for lesson planning, including background resources to inform their lessons. Each lesson also includes links to optional further resources. However, if required, the lessons can still be carried out with only the printed packs and a blackboard.

The basic overview was sent to Made Design Agency in November 2018, who created a template, alongside a selection of animal characters (the 'CLiP crew'), to help guide users through the packs and exercises. The design agency also created some printable activity pages that could be used in a wide range of groups (e.g. community groups, clubs and churches).

The original packs were developed for the Pacific region, with the aim for these to be tailored to each specific CLiP region so that the entirety of the CLiP countries had similar (but not identical) packs. For Belize, this included swapping some of the "CLiP crew" characters to new ones that are specifically important for Belize. For example, the main character was changed from a turtle to a manatee, because manatees are considered as the iconic marine species of Belize. The content of the packs was also tailored to be relevant for the Caribbean region rather than the Pacific region. The initial tailoring of the draft packs was important because it allowed the CLiP team to present packs that were already relevant to Belize to the ME and other stakeholders in initial meetings.

2.3 Initial engagement with Ministry of Education and other stakeholders

The CLiP education and outreach team started engaging with the Belize ME soon after arriving in country. An initial face-to-face meeting was held on 20 May 2019 with Darnelle Smith and other officers from the ME to introduce the CLiP Programme and the draft education packages. This was followed by regular communication via emails and telephone calls throughout the CLiP deployment in Belize. It was agreed between the ME and CLiP that the education packs will not be translated into other languages, as English is the official language used in primary and

secondary schools across the country. Before proceeding onto piloting the packs in schools and carrying out curriculum mapping, it was crucial to get Dr Carol Babb, the Chief of the ME to review the packs and to consider how they can support/align with the Belize curriculum and content standards. There were some unfortunate timing issues as CLiP was active at the end of the school year, which, in combination with its relatively short duration, meant the ME had limited resources to map the education packs to the curriculum. However, despite this the ME have remained enthusiastic and interested in the education packs and are still keen to process them so that they can be incorporated in the national curriculum.

A meeting with a wider range of key stakeholders to discuss education, outreach and best practises was held on 20 May 2019 at the Radisson Hotel in Belize City. This workshop was attended by 12 external attendees from government departments (ME, Coastal Zone Management Authority and Institution, Belize Solid Waste Management), tourism industry (Belize Tourism Industry Association) and NGOs (Belize Scouts Association, Toledo Institute for Development and Environment, and OCEANA). The primary aim of the workshop was to get feedback on the draft education (and community) packs, which could be used to further tailor them to account for specific issues related to marine litter in Belize.

2.4 Further tailoring of packs based on feedback

A section including text and images about why burning plastic is harmful was added after receiving some initial feedback and suggestions from the DOE and other key stakeholders. This message also fits the theme of the World Ocean Day 2019, dedicated to air pollution, which coincided with the time CLiP was in country, engaging with stakeholders. Furthermore, a paragraph highlighting the long-term beach monitoring data collected by the Belize Scouts Association was added in, and the “Additional Resources” and hyperlinks were changed so that they were more specific to Belize and the Caribbean region. The language was also modified from British English to American English based on the initial feedback.

2.5 Curriculum Mapping and Roll out in Belizean Schools

Following engagement at the workshop held in Belize City, the mapping of the CLiP Marine Litter Education Packs is being carried forward by officers at the ME in Belize. Although at the time of writing this report, the cut-off date had passed for achieving sign off to use the packs in the curriculum in the upcoming 2019/2020 academic year, there is still an opportunity to expedite the roll out through environmental clubs in schools, starting in high schools and then progressing to primary levels.

3 Results

3.1 Formal education

The education packs were produced in English language for two age categories: primary and secondary school aged children (Figure 3). Tailoring of the education packs was carried out in close collaboration with the DOE, and the ME.

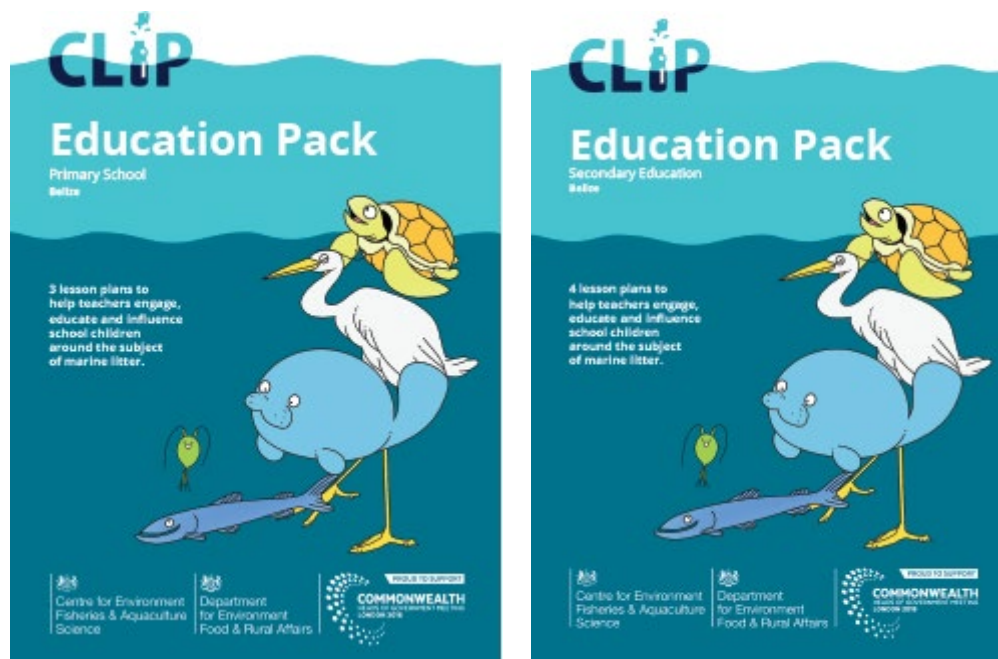


Figure 3.1. Front covers of the two CLiP education packs tailored in partnership with the Belize Ministry of the Environment and the Ministry of Education. The full packs are included in Appendix 1.

3.2 Education Packs for Communities

After the initial feedback and recommendations received from the stakeholders in an introductory workshop held on 20 May 2019 in Belmopan, the education packs developed for schools were adapted for further use in communities ('community packs') in two languages: English and Spanish (Figure 3.2). The stakeholder workshop also led to further discussions on collaborative working between the CLiP outreach and education team and various NGOs, including the Scouts Association of Belize, OCEANA, and the Audubon Society. Further meetings and conversations on the phone and by email were held with each of these organisations throughout the CLiP deployment in Belize, which led to trialling of the packs in events hosted by some key stakeholders (see below for further detail).



Figure 3.2 Front covers of the CLiP marine litter educational Community Packs. Full packs are included in Appendix 1.

The community packs were piloted by the CLiP outreach and education team in close collaboration with Belize Scouts Association in Belize City on 15 June 2019. The event was attended by ~50 scouts, between 6 and 17 years of age (Figure 3.3). In order to reach children from more deprived communities, the CLiP education and outreach team also trialled the community packs with 13 children, between 9 and 13 years of age, in the Belize City Christian Fellowship, which is a Mennonite church located on the south side of the river (Figure 3.4). The packs were also used in a community group event held jointly with the Audubon Society on 26 June 2019 with a class of around 20 students (Figure 3.5).

The community packs have since been published on the CLiP Website² to be made publicly available while also being promoted on Facebook.



Figure 3.3. Outreach event with the Scouts Association of Belize to trial the community packs.



Figure 3.4 Outreach session run at The Mennonite church using the community packs.

² <https://www.cefasc.org.uk/clip/resources/community-packs/>



Figure 3.5. Outreach event run jointly with the Audubon Society using the community packs

3.3 Discussion

Education around the subject of marine litter is an important part of the CLiP project. Educating future generations on the problems associated with marine litter and the actions that communities and individuals can take is vital in the reduction and prevention of marine litter at source. Education plays a key role in instilling and reinforcing behavioural changes that over time can become more and more pronounced. The approach taken to embed the CLiP marine litter education packs into the national curriculum will likely increase the scale and the duration of the benefits gained (Hacker & Rowe, 1997). However, bringing about curriculum change, despite a high degree of cooperation from the ME, is a lengthy process. Timing in this process is key, so it was unfortunate that the CLiP deployment could not avoid coinciding with a busy exam period and national school summer holidays. This process was therefore not wholly completed in the four months the CLiP was based in Belize. However, the ME clearly understands effective waste management and marine litter as a priority for Belize's future and has agreed to continue mapping beyond the duration of CLiP. As such, the exercise of mapping marine litter into Belize's curriculum forms an action in the MLAP.

Community education is arguably just as important as education through formal institutions (Filho, 1994). Adapting the packs for use in communities worked well in Belize and gained high levels of interest from a range of stakeholders, such as NGOs and communities groups, and aligned with the key recommendations and actions identified in the Best Practice workshop on 7 June 2019 (Cefas, 2020). Furthermore, the critical role of education in schools and

communities in tackling land-based and sea-based marine litter was underlined during the Education Targeted Stakeholder Workshop and the National Workshop by the broad spectrum of stakeholders who attended (NGOs, Government, private sector and donor agencies etc). The community packs have been translated into Spanish and are freely available on the [CLiP website](#), to make them available to anyone in Belize and elsewhere. NGOs already play an important part in environmental awareness education in Belize and include the Scouts Association of Belize and the Belize Audubon society. Continuous engagement and collaboration with these NGOs and government bodies involved in educating children in Belize has also increased the likelihood of the packs being used more widely by various community groups and clubs.

4 Forward Look and Recommendations

The education packs were well received in Belize. Education was identified as the most important recommendation/action to take forward to tackle marine litter in the Best Practises, Targeted Stakeholder and National workshops. However, the restricted timescales were problematic even with the early collaboration with the ME and other stakeholders. Therefore, it is hoped that the work to incorporate the education packs into the curriculum can continue beyond the deployment of the project. Projects working in future countries should consider the following recommendations:

- Engagement with the ME happens as early as possible.
- Timings are considered to account for busy periods such as end of year exams, and national school summer holidays, although it should be recognised that funding and timings don't always allow this.
- Research should be carried out and draft resources produced before work starts in country, and then adapted accordingly once in place.
- Engagement with other stakeholders should be commenced as soon as possible. Working together with the stakeholders to trial the community education packs also increases the likelihood of them being adopted for future use.

As highlighted in this report, the recommendations that emerged during the research, stakeholder meetings and workshops that lead to the formulation of the Belize education and community packs also informed Belize's Marine Litter Action Plan. Specifically: Action 25, on the mapping of key messages on marine litter into Belize's Curriculum; Actions 17 and 22 on coordinating messages and a behavioural change campaign respectively. The education and community packs formed a specific type of communication materials under Action 19, on the need for effective communication materials.

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