



Federal Ministry
for Economic Cooperation
and Development



Reducing the input of plastic litter into the ocean around Grenada

Applicability and effects of selected instruments

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List of abbreviations

CIM	Centre for International Migration and Development
CDB	Caribbean Development Bank
EPR	Extended producer responsibility
GBL	Grenada Breweries Limited
GDP	Gross domestic product
GRENLEC	Grenada Electricity Services
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH
GSWMA	Grenada Solid Waste Management Authority
ICCAS	Integrated Climate Change Adaptation Strategies
NGO	Non-governmental organisation
PET	Polyethylene terephthalate
SCCF	Special Climate Change Fund
SDG	Sustainable Development Goals
SIR	Spice Isle Recycling
UNEP	United Nations Environment Programme
Zofemat	Zona Federal Marítimo Terrestre (Federal Maritime Land Zone)

Executive summary

Background

Every year, many millions of tonnes of litter end up in the world's oceans, turning the sea into the world's biggest refuse dump and generating a host of environmental, economic, health and aesthetic problems. Land-based sources account for up to 80% of marine litter and include tourism, sewage outflows, poor waste management and illegal landfills as well as a lack of public awareness. International approaches like the Honolulu Strategy target the reduction of marine litter, the conservation of biodiversity and increased resource efficiency.

Plastic materials, especially plastic bottles and plastic bags, are among the most common items retrieved in marine litter monitoring programmes. Plastic is, after all, a very long-lasting material and is therefore a key pollutant. This project was launched by GIZ as part of its Concepts of Sustainable Waste Management sector project in order to contribute to reducing marine litter through the introduction of selected regulatory or economic instruments that promote the reduced use or reduced littering of relevant materials. Based on recent studies, as well as on discussions with partner countries, GIZ has decided to focus on reducing plastic bottle litter affecting the Caribbean islands of Cozumel (adjacent to and part of Mexico) and Grenada. This study focuses on the islands of Grenada.



Clean-up activities

Baseline information on Grenada

Grenada, a tri-island nation state with a total area of 344 km² and total coastline of 121 km, has around 107,559 inhabitants. Some 300,000 tourists visit the islands every year, mainly to explore and enjoy the islands' wealth of nature: their landscapes, coasts and seas. Two thirds of the islands' tourists only visit during the day, while the remaining third comprise stay-over tourists.

The waste produced on the islands is currently collected by a well-organised collection service that boasts a collection coverage rate above 98%. Many economic instruments have already been introduced to cover the high costs of waste collection, such as waste management fees for households rated according to electricity use, environmental fees for goods importers, tourist fees, and fines. However, a number of issues remain to be tackled and the cost of the waste management system is still greater than the income that it and its instruments collectively generate. There is still no integrated approach to waste management: the separate collection of different waste fractions has yet to be adopted and collected waste is primarily disposed of in Perseverance landfill, an open landfill site located close to the sea.

In addition, a large amount of waste still ends up as litter in the environment due to culturally ingrained habits, inappropriate waste-disposal behaviour, public lack of awareness, and tourism activities. It is estimated that around 15% of municipal waste is littered. The percentage of plastic bottle waste that is littered amounts to up to 30%.

Given the islands' geological and hydrological conditions, local stakeholders expect that most of the plastic bottle litter as well as some of the plastic bottle landfill waste will sooner or later end up in the sea, negatively impacting the islands' marine ecosystem.

Selecting an economic instrument

Drawing on the baseline information, different possible policy instruments were evaluated in terms of their practicability for reducing the amount of plastic bottles that end up in the sea around Grenada. Two of these instruments were subsequently pre-selected: (1) a deposit-refund system in tandem with a fee for importers and (2) a scheme for the separate collection of plastic bottles at source delivered along with incentives for local people.

Most stakeholders favoured the deposit-refund system, especially given that such a system has already been introduced for the glass bottles produced by Grenada Breweries Limited on the company's own initiative and that it works very well. Local people are therefore already aware of how this kind of system functions and, even though the system for plastic bottles will be set up in a different way, many of the experiences gained by the brewery could be useful for learning or replication. The main constraints affecting the preconditions for introducing a deposit-refund system are the identification of funds to finance the upfront investments (the Special Climate Change Fund is one possibility) and the amendment of the Environmental Levy Act, which must be analysed by the waste management authority.

To make the system commercially viable, the existing environmental levy on plastic bottles should be extended to preforms. On top of the deposit of around XCD 0.10 per bottle, importers should pay part of the environmental levy, up to XCD 0.20, into a fund as a handling fee. Importers then pass the deposit on to the retailers who, in turn, pass it on to the consumer. The fund could be managed by an independent agency that contracts with one or more collection companies, which then get paid for each bottle they collect. The collection companies are obliged to refund the deposit to anyone returning empty bottles. In addition, a waste compacting centre would have to be established to compress and pack the recycled materials collected for export or transfer.

Further instruments and measures are proposed to improve waste management performance, such as increasing the amount and density of covered public waste bins or restricting the use of plastic bags.

Conclusion

It is expected that the deposit-refund system would contribute significantly to reducing the amount of plastic bottle waste that ends up in the sea and, as such, would contribute to protecting the marine environment. Estimates as to the expenses and incomes involved in establishing and operating a deposit-refund system indicated that incomes would likely outweigh expenses, especially when maintaining the system over a longer period. This means that the development of a self-financing and self-sustaining plastic bottle waste management system is entirely possible. The implementation of a deposit-refund system would also create other economic and social advantages, such as new jobs and a cleaner environment for Grenada. For example, to operate the system, more than 20 full-time positions would need to be created.

Discussions also led to recommendations that the system be extended to include other beverages and packaging products in the future. However, before introducing the system, a detailed feasibility study should be carried out to ensure that the system is correctly introduced and that its design is successfully adapted to the local context.



St George's — waste placed in front of a door for collection by the collection company

1. Introduction

1.1 Background

Marine litter is a growing problem that poses an increasingly serious threat to the environment. Every year, many millions of tonnes of litter end up in the world's oceans, turning the sea into the world's biggest refuse dump and generating a host of environmental, economic, health and aesthetic problems. Marine litter consists of items that have been deliberately discarded, unintentionally lost or transported by winds and rivers into the sea and onto beaches. Land-based sources account for up to 80% of marine litter and include tourism, sewage outflows, poor waste-management, a lack of public awareness as well as missing waste management infrastructure and illegal or poorly managed landfills. The main sea-based sources for marine litter are shipping and fishing.

Apart from things like cigarette butts, plastic items – especially bottle caps, plastic wrapping and packaging waste – are among the most common objects observed in the majority of marine-litter monitoring programmes that study our regional seas. The available data shows that plastic bottles and bags are two of the main forms of plastic packaging recorded in marine litter studies. Plastic persists for several hundred years and is gradually broken down into smaller pieces. It therefore seems likely that the quantity of microplastics in the environment will continue to increase even if inputs of larger refuse items begin to decline (Galgani et al 2010). As such, these microplastics are and will be a key pollutant in our seas.

The individual behaviours and attitudes of local populations or tourists in coastal areas or of those living near inland waterways – not only relating to disposal, but also to consumption – have often been identified as the factors that most influence the prevalence of littering. Inappropriate waste collection and treatment infrastructure or sewerage systems as well as administrative capacities are other important factors.

It is commonly coastal areas that are most affected by the burden of waste in the sea. Small islands are particularly affected because their limited land mass exacerbates complications related to waste quantities and poor waste management. The vast majority of an island population generally lives within 10 kilometres of the coastline. As these communities often do not produce sufficient waste

to attract adequate investment to fund proper waste management facilities, their refuse is not properly handled and ends up in the ocean. Small islands depend very highly on tourism. Reducing the amount of litter in the surrounding environment will improve these islands' potential as tourist destinations and, as a result, will generate higher employment and incomes.

The Honolulu Strategy, launched by the United Nations Environment Programme (UNEP) in March 2011, aims to develop concrete solutions for the reduction of marine litter in order to decrease pollution, conserve biodiversity and increase resource efficiency. In light of the Honolulu Strategy, the recommendations of Rio+20, the work of the UNEP Global Partnership on Marine Litter, the proposed Sustainable Development Goal (SDG) target on marine pollution, and the activities proposed by the Caribbean Development Bank (CBD), the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH has committed to engage in tackling this pressing issue.

Under the aegis of its Concepts for Sustainable Waste Management sector project, GIZ aims to contribute to finding solutions through the analysis and development of

- prevention strategies that limit the creation of marine litter through, for example, awareness-raising measures and national regulatory or economic instruments that promote the reduced use or reduced littering of relevant materials; and
- improved integrated solid waste management at the local level.

Concepts for Sustainable Waste Management is focusing its efforts on analysing the applicability and effects of selected policy instruments that can contribute to reducing the input of litter into the oceans around selected partner countries.

A recent study carried out by the European Commission (de Vrees, Smith 2013) indicates that making general modifications to (a) recycling targets for waste or packaging waste and (b) landfill restrictions will have a limited impact on the reduction of marine litter. Another study looking at the largest loopholes existing within the

packaging cycle (BiPRO 2012) targeted specific waste streams (namely plastic packaging waste) and produced specific solutions and preventative measures for reducing marine litter. Both these studies consider targeted prevention measures on plastic bottle and bag litter to be particularly relevant.

Based on these studies, on its discussions with partner countries about their key issues in dealing with marine litter and on assessments of the most problematic plastic waste fractions, GIZ has decided to focus on reducing plastic bottle litter affecting the Caribbean islands of Cozumel (adjacent to and part of Mexico) and Grenada. This study focuses on the islands of Grenada.

Grenada is a tourism hotspot, particularly Grand Anse Beach in St George's and the south-western corner of the main island. With a large pier now in place on the main island, cruise ship tourism is steadily increasing. The large numbers of visiting tourists generate great quantities of waste that present a major challenge for local waste management and put great pressure on the island's marine and terrestrial biodiversity. As such, policy instruments focusing on the reduction of plastic bottle waste entering the sea must be tailored to the island's own particular circumstances.

Note that this study focuses on PET drinking bottles. Herein, these are mainly referred to simply as 'plastic bottles'.

1.2 Objectives

The purpose of this study, which was designed in coordination with GIZ's Integrated Climate Change Adaptation Strategies (ICCAS) programme, is to make a case to (primarily municipal) decision-makers in Grenada about the benefits of potential instruments for reducing the amount of litter, especially plastic bottles, that end up in the sea. Accompanying the presentation of these potential instruments are proposals and guidance regarding their appropriate design.

When seeking to introduce appropriate instruments for reducing marine litter, particularly that of plastic bottles, it is essential to:

- identify suitable instruments for reducing plastic bottle littering that are tailored to local contexts and that respect local preconditions;
- analyse the applicability and potential economic and environmental effects of the preferred options for tackling plastic bottle littering;
- propose, discuss and agree with partners recommendations for the design and introduction of a locally appropriate instrument for reducing plastic bottle littering.

This study was implemented with a national expert and the Grenada Solid Waste Management Authority (GSWMA).



2. Methodology

The study was divided into four stages:

1. a baseline study performed by a national consultant in Grenada;
2. desktop research carried out by an international consultant;
3. a field visit where an international expert visited Grenada and carried out consultations with relevant stakeholders;
4. an analysis of the information received and production of a report.

In the baseline study, the national expert collected information from existing literature and interviewed stakeholders on the current situation in Grenada in terms of waste management in general and plastic bottle waste management in particular.

The desktop research carried out by the international expert identified potential policy instruments for reducing the plastic bottle waste liable to end up in the local sea. In addition, the information provided by the national

expert on the situation of plastic bottle waste and its management on the island was used in the identification and evaluation of policy instruments (see Annex 2). Two instruments that were deemed suitable for deployment in Grenada were subsequently selected and a set of preconditions for the successful introduction of these instruments on the island was developed.

During the field visit to Grenada, relevant stakeholders were invited to meetings and interviews to discuss the policy instruments and preconditions and to select one of the two instruments for further development.

Based on the information received, the most suitable instrument was worked up into a recommendation for an approach to reduce the amount of plastic bottle waste entering the marine environment, which was then presented to decision-makers in Grenada. The economic, environmental and social impacts of this recommendation were, as far as possible, also assessed.

While plastic bottles are produced using a range of different plastics and for diverse uses, the majority are PET bottles for containing beverages. As such, this study focuses on PET plastic drinking bottles.



Perseverance Landfill,
waste bins

3. Overview of the current situation

The following chapter provides relevant background information about the island and an overview of the current situation in Grenada in terms of waste management in general and plastic bottle waste management in particular. It is based on the baseline report conducted by a national expert (see Annex 1). The stakeholders consulted and sites visited for the purposes of this research are also listed (see Annex 2).

3.1 Country profile

Grenada is a tri-island nation state that, along with the main island of Grenada, includes the islands of Carriacou and Petite Martinique. The combined total area of the three islands is 344 km² and their combined coastlines stretch along 121 km. Geographically, Grenada is located among the Lesser Antillean islands of St Vincent and the Grenadines and the Republic of Trinidad and Tobago. The centre of Grenada is mainly mountainous with slopes descending gently towards the coasts. Most of Grenada's population¹ lives within a few kilometres of the coast.

Grenada has a small, open economy that is extremely vulnerable to high-impact hazards and changes in the global economic landscape. Important economic sectors are agriculture and tourism. Manufacturing and production industries make up only a small share on the nation's GDP.

Grenada is subject to extreme weather events such as storms, floods and droughts. In 2004 and 2005 two hurricanes severely damaged Grenada's infrastructure and biodiversity, causing, for example, soil loss, coastal erosion and habitat destruction. There is an increasing risk of further natural hazards in this region.

Grenada has a rich heritage of biodiversity. The country's coastal zone is characterised by open seas containing a number of marine ecosystems such as coral reefs, beaches, seagrass beds, and mangrove and coastal lagoons. These ecosystems themselves contain an estimated 233 marine species, 69 marine or brackish-water species, 17 freshwater species, four turtle species and several seabirds (Government of Grenada 2009).

1 In 2012, there were 107,599 inhabitants (CARICOM secretariat, 2015).

Given the numerous ways in which marine litter can harm aquatic wildlife and humans (e.g. through bio-accumulation, the adsorption capacity of toxic substances in microplastics, etc.), the management of plastic litter in coastal and marine habitats is a top priority for the Caribbean island.

3.2 Current status of Grenada's waste management system

The responsibility for solid waste management in the State of Grenada primarily falls to the Grenada Solid Waste Management Authority (GSWMA), as laid down in the GSWMA Act No 11 of 1995. Working within the limits of its resources, the authority is expected to provide leadership for the management of solid waste at the national level. The ministry tasked with ensuring the sensible use of environmental resources is expected to play a regulatory role in the management of solid waste.

The State of Grenada has not yet adopted an integrated approach to waste management and most waste is currently sent to landfill. However, there are some small-scale efforts in place to minimise waste including, among other things, composting, waste separation, source reduction,² and reuse.

To ensure collection coverage extends as far as possible across the islands, the State of Grenada is divided into five solid-waste-management zones: **Zone 1** – South and North St George's, and St George's Town; **Zone 2** – St David and South St Andrew; **Zone 3** – St Andrew and St Patrick East; **Zone 4** – St John, St Mark and St Patrick West; **Zone 5** – Carriacou and Petite Martinique. Each zone is subcontracted to a private contractor that is responsible for the efficient and effective collection of household and institutional³ waste, as specified by GSWMA. Contractors are expected to provide twice-weekly kerbside collection services in each village, and daily collection along the islands' main roads. While the

2 Particularly in the eco-labelled hotels that emphasise their use of less-polluting materials.

3 Examples are schools and government offices. NB: GSWMA does not handle biomedical waste – that is the responsibility of the Ministry of Health or the private medical facility generating the waste.

2001 Waste Management Act specifies that commercial entities should be responsible for the waste they generate, a vast number of businesses use the kerbside collection services operated by GSWMA. The street cleaning services provided in all towns also handle the maintenance of drains, pavements and seafront areas. They do not, however, provide these services for the Grand Anse area,⁴ even though it is one of the most highly used pedestrian and vehicular locations for both locals and tourists. The Authority’s zonal supervisors monitor the daily performance of their contractors to ensure they comply with best practice. Authority officials and other key stakeholders positively evaluated the collection system and emphasised the dedication of the contractors. The current kerbside collection rate for municipal solid waste is estimated at 98%. The few areas not covered are generally inaccessible and/or are located in unplanned developments such as squatter communities.

Collected solid waste is transported to the Perseverance Landfill site for final disposal. This site is located on Grenada’s west coast, only 500 metres from Halifax harbour. A second, smaller landfill (Dumfries Landfill) operates on Carriacou. In the case of Petite Martinique, assigned contractors ferry waste over to Carriacou for disposal in the Dumfries Landfill. Importantly, none of these landfills has been engineered and built using industry techniques or standards.⁵ Waste is simply dumped in open tips, which poses potential risks for human health and the environment. The Authority is currently finalising plans to redevelop select cells at the Perseverance Landfill with the aim of turning the site into a model facility.

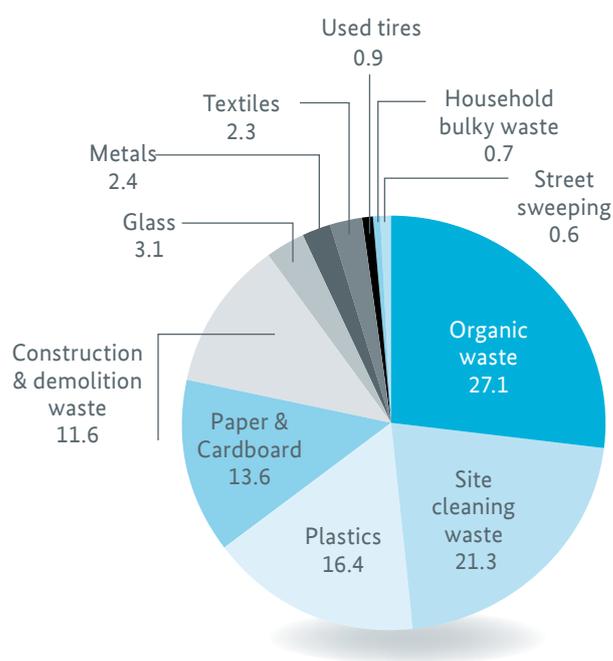
Grenada also benefits from an informal sector that collects recyclables. In almost all the country’s major towns, a number of people scour the streets and drains for glass bottles, which they return to claim the refund of XCD 0.25. There is also a well-established waste-picking operation at the Perseverance tip. Some 40 persons, both male and female, visit the landfill most days looking for

potentially useful objects (mainly scrap metal) that can be used or sold. A large number of these people have been on the wrong side of the law at some time or other. While GSWMA understands that these activities offer disadvantaged people positive options for making a living, the potential risks of injury and likelihood of conflicts must be taken into consideration when looking at the role this sector plays in the system.

Waste composition

As almost no waste separation is carried out in Grenada, household waste is likely to contain a significant share of recyclable materials including organic matter, plastics and paper. This serves to demonstrate the immense potential for waste retrieval and recycling, should the required infrastructure be installed. In 2013, per-capita waste stood at 1.02 kg per day. By 2014, this had increased by 5.9% to 1.08 kg per day. To assess waste trends in Grenada, an overview of waste composition in 2009 is presented in Figure 1.

Figure 1: Waste composition in Grenada by fraction (in %)



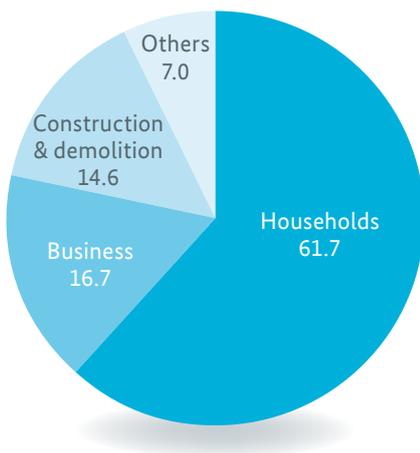
Source: GSWMA, 2009

4 Grenada’s commercial and tourism centre.

5 In 2001, with funding from the World Bank, the government constructed an industry-standard landfill at Perseverance, which was then destroyed by landslides in the same year. Although the cells were used temporarily for varying periods thereafter, disposal ceased at that particular site in 2011.

The highest volume of waste in 2009 was produced by households (61.7%). The share of waste generated by businesses was 16.7%, with construction and demolition accounting for 14.6%. Organic waste represented the main waste stream (27.1%), while site cleaning waste amounted to 21.3%. Plastics making up 16.4% comprised the third largest form of waste disposed of in Grenada. Very little information is available on the quantity of waste produced in Carriacou and Petite Martinique.

Figure 2: Amount of waste generated by different sources (%)



Source: GSWMA, 2009

Stakeholders hypothesised that the present waste stream is probably similar to that of 2009, although it is likely that more plastics are in circulation due to the perceived increase, post Hurricane Ivan, in formal and informal start-up food-based businesses producing plastic-packed food. Given that plastics negatively affect human health and wildlife, they form the focus of the following section.

Main sources of marine litter in Grenada

Most respondents asserted that the magnitude of littering in Grenada appears to be much less than that of other CARICOM member states. While this may or may not be true, most stakeholders were of the opinion that littering in general and plastic bottle litter in the sea in particular continue to be a challenge. The main sources of marine litter around Grenada are considered to be local people’s inappropriate waste disposal behaviours, the lack of public awareness, tourism activities, and insufficient waste management.

Stakeholders agreed that the public is aware of how solid waste should, in an ideal world, be treated and of the harm that results from inappropriate disposal. However, there appears to be a disconnect between people’s knowledge levels and attitudes on the one hand, and their behaviours on the other. Local people were consistently cited as the main source of littering. The following points are possible reasons for the public’s inconsistent compliance with appropriate solid waste management practices:

- An ineffective legislative and regulatory framework and, in particular, **weak enforcement and almost negligible penalties.**
- Inadequate respect for the natural environment.
- Culturally ingrained habits and standards.
- Not enough bins are installed, particularly in areas where (e.g. town centres) or at times when (e.g. during major festivals) waste generation is high.
- The lack of street cleaning services in the commercial centre of Grand Anse in St George’s.

Discussions with stakeholders on the demographic profile of people who litter indicated that people of all ages and socio-economic backgrounds could potentially litter. It was, however, noted that it would be a lot easier to change the behaviours of young people than of adults.

The following were identified as the main sources or hotspots of littering in Grenada:

- poorly maintained bins,
- high-footfall commercial areas,
- unmanaged recreation fields,
- well-attended outdoor parties or festivals that are mainly visited by tourists.

Stakeholders reported that, while local people are the main source of littering, tourists are also a source of litter on the island. Although they were unable to comment on the extent of littering perpetrated by tourists, it is clear that this group of consumers partially contributes to the island's litter problem.

Fly-tipping is also a problem and one that is mainly perpetrated by the truck drivers who transport construction and demolition waste and/or commercial waste to the landfill. A small percentage of households are also involved in this practice. Littering by vehicle occupants, while not pervasive, continues to be of concern to GSWMA and its results can be witnessed along the island's main thoroughfares.



3.3 Lifecycle of plastic bottles

Plastics bottles⁶ are not produced in Grenada; rather, they are imported as end-products or as preforms.⁷ At the point of importation, environmental charges are levied on all plastic and glass bottles. However, this levy is not imposed on preform bottles (see Annex 1).

In 2013, preforms made up around 84.4% of the total of plastic bottles imported into Grenada, amounting to 27.9 million PET bottles (see Annex 1). However, the statistics for 2012 and 2014 indicate that 2013 was a peak year and these levels were already decreasing in 2014. Assuming that the average bottle⁸ weighs 30 g, it can be estimated that a total of 33 million plastic bottles were imported into Grenada in 2013, the majority of which is most likely to be PET.⁹ Few or no plastic bottles are currently exported from Grenada.

With regard to the lifecycle of plastic bottles in Grenada, all products that are placed on the market are imported. As no more-accurate data are available, it is estimated that the number of plastic bottles imported equals the number of plastic bottles wasted. In 2013, about 66% of all post-consumer plastic bottles were sent to landfill, around 4% were recycled and around 30% remained unmanaged. Therefore, a total of 594 tonnes of plastic bottles had the potential to end up as marine pollution.

It must be remembered that most of these data are estimates based on existing literature and expert opinions and thus could differ from the real-life figures.

⁶ In this report, the term 'plastic bottle' refers to PET and other types of plastic used as packaging for beverages and water.

⁷ Preforms are small bottles that can be heated and blown larger. Grenada's water and beverage companies used preforms because of their flexibility and reduced importation costs.

⁸ At least three sizes of bottle are imported: 5 litres (typically 80 g), 1.5 litres (typically 37 g), and 0.5 litre (typically 16 to 18 g). Given that more 0.5-litre bottles are imported than 5-litre bottles, an average weight of 30 g can be assumed.

⁹ While PET plastics represented a significant percentage of all plastics imported, the exact share was not determined when preparing this report because of gaps in the existing data.

Important stakeholders in this process are the public sector, importers, NGOs, the private sector, consumers, and stakeholders involved in waste separation, collection and reuse. The baseline report in Annex 1 contains a plastic bottle stakeholder map.

3.4 Economic instruments in operation

Two main economic instruments for waste management are currently operational in Grenada:

1. An environmental levy

- a. On importers: A levy of XCD 0.25 is imposed on glass and plastic beverage containers imported into Grenada, the funds of which are forwarded to GSWMA. When the importer re-exports the beverage container or disposes of it in a manner acceptable to GSWMA, 80% of the levy is refunded to the importer. Preform plastic bottles are excluded from this levy (constituting 84.4% of all imported plastic bottles in 2013). The strengths and weaknesses of this economic instrument are described in the *Baseline Report, Grenada* (see Annex 1).
- b. On tourists: Each stay-over and seaborne visitor will be charged USD 1.50 (XCD 4.05) as a one-off entry fee for Grenada.
- c. On households: The charge for the environmental levy on households is set according to electricity consumption. Households consuming less than 100 kW hours per month (45%) will not be charged.

2. A **deposit-refund system for glass bottles** was introduced in the early 1970s by Grenada Breweries Limited (GBL) under the company's own initiative as part of its commitment to corporate stewardship.

Despite the success of the deposit-refund system for glass bottles (see Annex 1), GBL officials emphasised the lack of government incentives to run the system, which could be

used to promote the continued use of glass bottles. GBL officials also thought that, when a company successfully exports bottles, it should receive a 100% rebate of the environmental levy and not 80%.

3.5 Actions undertaken to improve solid waste management

GSWMA is delivering a number of initiatives designed to improve how the solid waste stream is managed. Four of its main programmes are as follows:

1. The Environmentally Friendly School Initiative is a programme targeting pre-primary, primary and secondary schools where, for nine months each year, participants undertake projects that focus on different aspects of solid waste management. Projects can cover public education, litter management, waste minimisation, and the nexus between waste management and tourism. The programme is evaluated and incentives are provided for excellent performance. On average, 56 schools participate in the programme each year.
2. GSWMA, in collaboration with the Ministry of Health, delivers an annual Food Vendors Licensing Workshop, which aims to promote, among other things, best practices in waste management for the food service sector.
3. GSWMA produces a regular radio programme that is broadcast every day on seven different radio stations.
4. GSWMA supports any initiative geared to promote effective solid waste management.
5. A range of non-governmental organisations and private sector companies are involved in diverse interventions and, in particular, interventions seeking to tackle plastic waste management issues.

Other initiatives include environmental certification programmes for hotels, clean-up campaigns, and hotel and retailer commitments to import or use alternatives to plastics. In addition, the Grenadian Hotel and Tourism Association and GSWMA have proposed banning styrofoam products (see Annex 1).

4. Selecting a suitable policy instrument

4.1 Pre-selection of instruments designed to reduce the amount of plastic bottle litter that ends up in the sea around Grenada

Different policy instruments offer different waste management outcomes. To meet the aims of this project, a range of possible policy instruments and additional measures were considered for further evaluation. Some of the instruments aim to reduce plastic bottle waste generation and some to install proper treatment systems, while others directly aim to reduce the amount of plastic bottle waste entering the sea. That said, all of these approaches ultimately aim to reduce plastic bottle waste entering the sea.

The further evaluation of two possible policy instruments was carried out by assessing information provided by the national expert on the current waste management situation on the islands (see Annex 1). The feasibility of implementing these policy instruments and their additional/support measures in Grenada was then also evaluated (see Annex 3).

As described above, the littering of plastic bottle waste is certainly a problem in Grenada. Data exist on the sources and make-up of litter found on six beaches in Grenada but, so far, our experts have not been able to access the results of this analysis. As such, we must rely on estimates that the main sources of litter are local people of all demographic profiles – the overriding opinion is that only a small amount of littering on the islands is perpetrated by tourists. The locations most affected by litter are unmanaged recreational areas, high-footfall commercial areas and outdoor party locations. Most of the plastic bottle waste generated is disposed of in local landfills, which are located adjacent to the coast. This being the case, weather events can also contribute to introducing plastic waste into the sea. Although approximately 98% of the Grenada benefits from waste collection services, there is no separate collection system in place for different waste fractions. As such, when selecting suitable instruments, it is important to focus on promoting the separate collection of plastic bottles.

According to the information provided by the local expert, many policy instruments are already provided for in existing legislation. However, a number of them (tipping fees for the private sector and a system of fines) are not enforced and controls are very weak. Therefore, establishing standalone command and control instruments does not seem appropriate. It might be better to offer greater incentives to people so that they manage their waste correctly and reduce or stop their littering.

Based on the desktop research evaluation, the following two policy instruments, which ultimately seek to reduce the littering of plastic bottles and increase separate collection, were selected for further development:

1. Deposit-refund scheme within Extended producer responsibility (EPR)
 - Establish a deposit-refund system for plastic bottles, drawing on the experiences gained in implementing the islands' existing glass bottle deposit-refund system. This well-received and well-run system's infrastructure and also people's awareness of it serve as useful examples for any new PET recovery scheme.
 - Finance the system using the methods that are already in place for charging advanced recycling fees (i.e. the environmental levy on imported plastic beverage containers provided for in Act No 12 of 2000 and Act No 13 of 2007). The weaknesses detected in the implementation of this environmental levy must, however, be mitigated (see Annex 1).
2. Incentivising separate waste collection in tandem with introducing pay-as-you-throw (PAYT) principles in the charging system

The deposit-refund scheme, which focuses on mitigating the problem of plastic bottle litter, looks very promising because the experience of Grenada Breweries' voluntary scheme for glass bottles shows that key elements involved in this kind of scheme are already accepted and functioning.

The second option, which involves reforming the waste collection and charging system, should be viewed as more of a mid-term approach. Implementing these changes may take more time but it will ultimately deliver long-term benefits that drive up recycling rates and decrease the amount of waste going to landfill in Grenada.

4.2 Outcome of the stakeholder consultation

Stakeholder consultations to inform the selection of one of the proposed options were carried out during the field visit to Grenada.

4.2.1 The stakeholders involved

The consultations involved the following stakeholders/ stakeholder groups:

- Permanent Secretary of the Ministry of Agriculture, Lands, Forestry, Fisheries and the Environment,
- Chief Environmental Health Officer of the Ministry of Health,
- Grenada Solid Waste Management Authority,
- Operations Manager of Perseverance landfill,
- Hotels and Tourism Association,
- Importers/retailers of plastics bottles,
- Public sector stakeholders (port authority, bureau of standards, GIZ),
- NGOs involved in conservation and clean ups,
- Waste collection contractors,
- St George's University,
- Grenada Breweries Ltd,
- Spice Isle Recycling (a recycling company),
- Carriacou's waste contractor and retailer.

4.2.2 General outcome

All the stakeholders confirmed that Grenada is working hard to develop its waste management system, but that the island still has a problem with litter in general and with plastic bottle litter specifically. Local people have been identified as the primary source of litter, which is the product of cultural habits and low levels of awareness. Problematic locations include highly frequented areas such as high-footfall commercial areas, unmanaged recreation fields and well-attended outdoor parties or festivals. In the rainy season, waste is washed down the drains and rivers and flows out into the sea. Grenada's landfill, an open tip located directly next to the sea, contributes to plastic bottle littering as there is no or only very low separate collection of plastic bottle waste. Indeed, currently there is no separate collection system for any form of waste in Grenada and all waste collected is sent to the landfill.

Most stakeholders were convinced that moves to give waste bottles a certain value would act as an incentive for local people, prompting them to hand bottles in instead of throw them away. Therefore, of the two instruments proposed, they favoured the deposit-refund scheme. Some stakeholders stated that separation at source in tandem with PAYT elements would mainly engage those people who, to a certain extent, are already aware of the issues, whereas the deposit-refund system would reach all inhabitants. Also, local people already participate in the successful Grenada Breweries' deposit-refund system for glass bottles, which was instituted in the 1960s on a voluntary basis, so they are used to this kind of system. Indeed, the deposit-refund system for plastic bottles could build on the experiences gained when setting up this glass bottle scheme.

Only the representatives of the hotel and tourism sector favoured the PAYT scheme, maintaining that separate collection at source could and should be introduced. They all agreed that something must be done now to reduce the amount of littering and of recyclables going to the landfill. A few of them are considering establishing their own waste collection company and waste compacting centre and have already discussed possible international sources of funding, such as the Climate Adaptation Fund, and possible locations, one of them close to the airport. One

hotel manager, who has already established a separate waste collection station at her hotel, mentioned that the community of Monte Verde in Costa Rica has introduced a recycling project where they recycle and repurpose used plastic bottles to make signs and build trails in the mountains for tourists. She plans to set up a twinning project so Grenada can learn from them and perhaps also establish a recycling company on the island.

4.2.3 Verifying the preconditions

To establish economic instruments, certain preconditions must be fulfilled. For this reason, the project team developed preconditions for the two proposed instruments in advance, based on the information provided by the national expert and the desktop research. These preconditions were then discussed in meetings with the actors involved. As most of the stakeholders had already stated at the outset that they preferred the EPR scheme with a deposit-refund system or elements of such a system, preconditions mainly relating to this approach were discussed and evaluated, with the following outcomes:

- *The instrument should not run contrary to existing laws or agreements*

According to stakeholder feedback, the introduction of a deposit-refund system would not run contrary to existing laws or agreements.

- *The correct institutions for issuing the necessary legal provisions must be identified and they must agree to issue the relevant legal provisions.*

The powers to issue the new legal provisions lie at the national level.

GSWMA would have to draft a new law or amend an existing one. The Ministry of Agriculture would then put the draft law or amendment to parliament (government executive). After a consultation phase (not required for an amendment), the Ministry of Legal Affairs would have the final say.

With regard to the development of the legal provisions required to introduce financial instruments, the Ministry of Finance must be involved in and agree with the process and its objectives. However, as an environmental levy already exists, no new financial instruments would need to be introduced. Instead, the existing financial instruments could be amended for this purpose.

- *The government or authority responsible for enforcement and control should have enough capacity for ensuring correct implementation.*

Both the Ministry of Agriculture and GSWMA have only limited capacity. Enforcement officers from the Ministry of Health as well as environmental wardens will be involved in controlling the correct enforcement of the Anti-Litter Act, so perhaps they could also take charge of controlling the correct implementation of the deposit-refund system. The system needs to be set up in such a way that it functions with relatively little control required from the government and relevant authorities.

- *Basic infrastructure should be available or must be made available for the deposit-refund system, such as collection points and treatment facilities.*

Although Grenada Breweries Ltd has put relevant infrastructure in place for its glass bottle deposit-refund scheme, it is doubtful that this infrastructure could also be used for plastic bottles as the collection facility and trucks all belong to the private brewery. It is also unlikely that the small shops collecting glass bottles for the brewery would also collect plastic bottles, as this would mean a much higher number of bottles for them to store. Therefore, the collection company/ies would need to build new infrastructure, which would be financed by the additional income generated by the deposit-refund system and possible external funding. According to stakeholder information, sufficient locations and space are available for installing collection points and a collection/recycling facility. However, one expert contradicted this understanding, stating that space is rare and mainly in private hands. One small recycling facility already exists, which could be included in the scheme and possibly extended.

The government or authority responsible for enforcement and control should have capital available for initial investments and the accompanying awareness-raising campaigns.

According to feedback from a Ministry of Health enforcement officer, there is currently no financial capacity available. The Ministry would ask the private sector, agencies and other institutions what monies they might be able to make available for this scheme. Some of the stakeholders proposed a public–private partnership. The local recycling company already signalled that it would be interested in opening more collection points to collect plastic bottles and this option should certainly be considered. Also, the possibility of securing funds from the private sector, other institutions or international organisations such as the Special Climate Change Fund (SCCF)¹⁰ needs to be evaluated.

- *In general, the government, private sector and public should accept this system.*

All stakeholders confirmed that the issue of plastic bottle littering needs to be tackled and most were in favour of introducing a deposit-refund system. It can be expected that the scheme will be well accepted given the success of the Grenada Breweries glass bottle deposit-refund system. To get the commercial sector to also buy in to the scheme, it would be better to install collection points rather than oblige the sector to take back bottles. For Grenada's many small shops, an obligation to take back empty bottles could end up being a substantial burden.

- *To make the public sufficiently aware of improved waste management approaches, awareness-raising campaigns and education programmes could be run.*

There is still plenty of room for increasing public awareness about improved waste management and the disadvantages of littering for the environment.

- For this reason, the introductory phase of the deposit-refund system should be accompanied by a long-term awareness-raising campaign. When defining the handling fee for operating the deposit-refund system, it is therefore useful to factor in the budget required for carrying out awareness-raising campaigns or to check whether other funds are available for this purpose.
- *A market for used plastic bottles needs to be put in place.*

There is no market for the recycling of plastic bottles in Grenada, but there is an international market that Grenada could link in to. However, the prices currently paid are low. Incentives should be put in place for collection and recycling companies, such as tax reductions that enable them to create new markets and subsidies funded using part of the environmental levy. Another option discussed was the creation of a regional initiative that gets neighbouring islands working together to set up a system for collecting and, if possible, recycling post-consumer plastic bottles.

- *Currently, the Environmental Levy Act makes provision for 80% of the existing importer levy to be repaid only to importers that take back bottles or manage them in an acceptable way. This Act needs to be amended to make it possible to also pay this 80% rebate to collection companies that collect and export or recycle bottles (for more detailed information, see Annex 1).*

This is a potentially feasible option and one that is already being implemented on other islands. GSWMA needs to analyse and evaluate this kind of scheme in detail.

- *It is important to ensure that all importers and small traders that are required to pay the environmental levies do so in practice.*

GSWMA confirmed that this is already the case and that there is no possibility of avoiding the system.

¹⁰ For more information, visit <https://www.thegef.org/gef/SCCF> (accessed on 29 October 2015). On this page, point 3 indicates that the SCCF also finances selected waste management projects.



Spice Isle Recycling –
waste collection centre

- *All plastic beverage containers, including preforms, should be subject to the environmental levy in order to reduce market distortions and make financing viable.*

This modification is a recommended action of this study and, to be feasible, will require the amendment of the Environmental Levy Act.

Many of the preconditions for establishing a deposit-refund system are already fulfilled or are likely to be fulfilled. With regard to initial investments, funds will need to be identified such as the Special Climate Change Fund. GSWMA will, of course, need to analyse the precondition relating to the amendment of the environmental levy, but this scheme is very likely possible given that there are similar schemes already operating on neighbouring islands.

4.3 Selecting the preferred instrument

Based on the outcome of the stakeholder meetings, it is proposed to ‘put a value on the bottle’ to incentivise consumers to return plastic bottles instead of littering them. This could be done by:

- introducing a deposit-refund system for plastic bottles (like those already operating in, for example, Hawaii and Kiribati) in tandem with the repurposing of a percentage of the environmental levy (up to 80%) for use as a handling fee to run the system;
- providing a percentage of the environmental levy (up to 80%) to collection companies in return for them setting up a take-back system that, in turn, pays a share of this levy income to anyone handing in an empty bottle (for example, in Barbados, collection companies are paid by the municipality for exporting plastic bottle waste and can therefore pay a certain amount to people who hand in empty bottles).

Both options require amendments to the current legislation (as described in Section 4.2.3 above).

While the second option would be easier to introduce, it is deemed to be a less effective approach than the first option when it comes to reducing the input of plastic bottles into the sea (depending on the value placed on the bottle and the number of collection points installed).

The following chapter proposes the introduction of a deposit-refund system. However, if required by GSWMA, the partial use of the environmental levy with deposit-refund elements could still be an option for reducing the amount of plastic bottle waste that ends up in the sea.

5. Proposal for the implementation of a deposit-refund scheme

A deposit-refund scheme can be implemented in a number of ways. Nevertheless, it is recommended to consider existing approaches. As previously mentioned, Grenada Breweries Ltd has a well-established and well-managed voluntary deposit-refund system for glass bottles. The brewery reports a recovery rate of more than 90%, and the return rate is even higher. Local people therefore already understand and buy in to the deposit-refund concept, which makes introducing and successfully operating a deposit-refund scheme for plastic (drinking) bottles an easier proposition.

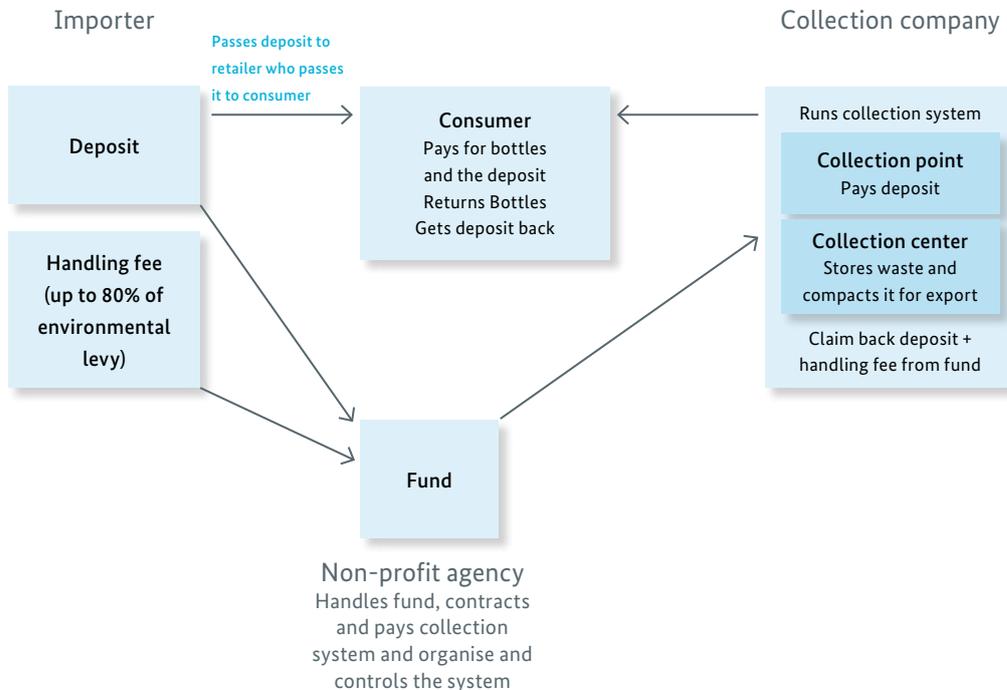
A deposit-refund scheme for plastic bottles should therefore be introduced that draws on the experiences of the system already in place for glass bottles as well as on the approaches set out in the advanced recycling

fees concept. When introduced and operated correctly, deposit-refund schemes have proved to be effective solutions to the problem of beverage container waste.

Deposit-refund systems are already in place on a number of other islands, such as Kiribati and Hawaii, and the systems often vary significantly according to the conditions and situations of the islands in which they operate. Several reports on already established or proposed deposit-refund systems in Hawaii (Hawaii 2009), Kiribati (Kiribati 2005), the Marshall Islands (Leney et al 2005), the Federated States of Micronesia (Leney 2005) and New Zealand (Envision New Zealand Ltd 2007) were analysed and evaluated in order to draw out the best recommendations for Grenada.

Grenada’s system could be structured as follows:

Figure 3: Deposit-refund system for plastic bottles in Grenada



5.1 Legal conditions

To establish a deposit-refund system in Grenada, new legislation as well as amendments to existing legislation would be required. As already defined in the preconditions (see Section 4.2.3), any legislation developed for a deposit-refund system would not run contrary to any existing laws. The new legislation should set out the framework for running the system, which should as a minimum define:

- clear roles and responsibilities;
- established recovery targets;
- the value of the deposit;
- the type of products to be included – the system should be flexible so it can be expanded to take in other beverage containers/products;
- the responsibilities for operating the system (conditions of the contract, such as the proof required to demonstrate the environmentally sound management of bottle waste);
- a system operator;
- a financing scheme and clear description of the financial flows between the different stakeholders involved;
- the number of waste collection points or their density;
- the reporting requirements;
- any penalties and control mechanisms.

This legislation should be linked to the existing Environmental Levy Act. The conditions of the environmental levy for plastic bottles should be amended so that 80% of the levy can be paid into a fund instead of only to importers. An example of this kind of legislation, adopted in Kiribati, is provided in Annex 4.

5.2 Financing the system

To finance the system it is recommended to repurpose a percentage of the pre-existing environmental levy paid by importers to use as a handling fee. Current legislation grants importers the right to receive an 80% rebate on the levy if they re-export beverage containers or dispose of them in an acceptable manner (which is evaluated by GSWMA). However, at present, none of the islands' plastic bottle importers makes use of this option. It is therefore recommended to amend this legislation so that 80% of the environmental levy for plastic bottles or parts of it can be used to finance the deposit-refund system.

Currently, imported preform bottles are exempted from the environmental levy. Manufacturers argue that preform bottles are exempted because they require processing and thus incur manufacturing costs on the island. However, manufacturers pay less for preform bottles than for fully blown bottles and, due to the reduced volume of preforms, the shipping costs are also lower. Given that preform bottles end up as full-size bottles and must be treated after use in the same way as pre-blown bottles, it is recommended to extend the levy to include preform bottles.

The environmental levy should be paid into an established fund. Currently importers pay the environmental levy to the customs service, which forwards the revenue on to GSWMA. In future, the deposit should continue to be paid to the customs service, but the latter should then put the levy revenue into the fund. Alternatively, importers could pay the levy charges directly into the fund.

Stakeholders also discussed how much to charge for the deposit. For glass bottles, the deposit is currently XCD 0.25, but the recommended charge for a plastic bottle came out at around XCD 0.10. Therefore, the deposit for plastic bottles will be at least XCD 0.10 per bottle.

Any money remaining in the fund due to unredeemed deposits can also be used to finance the system. This process of earmarking unredeemed deposits to finance the not-for-profit agency must be included in the legislation adopted.

In addition, the collection company/ies will earn an income from selling plastic bottle waste to recycling companies.

More detailed information on the financing of the system can be found in Section 6.

5.3 Operating the system

There are different options for running the system. One involves the government taking responsibility for organising the system and contracting with one or more waste collection companies, which are tasked with setting up collection points and facilities to compact and prepare materials for recycling. Another option is to establish a not-for-profit agency that is responsible for organising the deposit-refund system and contracting waste collection companies. Based on stakeholders' comments, it would be best to establish a not-for-profit agency that is supervised by GSWMA. The agency would be the only institution with access to the fund and would use the money it contains to meet the costs of administration, controls, infrastructure and awareness-raising campaigns and to pay the handling fee and deposits to the collection company/ies. The agency would be required to report on a regular basis to GSWMA, listing all income and expenditure.

As Grenada is relatively small and thus has a reduced administrative burden, it is proposed to contract with one collection company that is made responsible for setting up collection points and running the collection centre. However, to ensure the service is competitive and to prevent a monopoly from arising, other possibilities could be reviewed. One recycling company already exists in Grenada but it had to reduce its collection and export of plastic bottles because the income it made on selling recyclables to overseas recycling companies was insufficient. This company could be included in the system. However, an open bidding procedure should be conducted and a number of conditions must be built into the contract, including:

- the minimum number of collection points to be established (e.g. at least one in each city/location of over 100 inhabitants/each island);

- the scheduling of empty plastic bottle collections at a certain frequency and in highly frequented areas in particular with mobile collection points (i.e. with a collection truck, similar to the glass bottle collection service operated by the Grenada Breweries Ltd);
- the provision of evidence that recyclables have been treated in an environmentally sound manner – the handling fee will only be paid for the amount/number of bottles collected, exported and received by a recycling company;
- the delivery of annual obligatory training for collection point operators;
- specific additional environmental requirements.

When introducing deposit-refund systems, the question always arises as to whether bottles should be returned to retailers or to designated collection points. As mentioned above, Grenada has a lot of small-scale retailers for whom taking back empty bottles may be a substantial burden. That said, small shops do participate in Grenada Breweries' well-functioning glass bottle deposit refund system. It is therefore recommended that retailers be given the option of taking bottles back and then returning them to a collection point or waste compacting centre on a voluntary basis. This implies that they would not receive a handling fee. The incentive for them is therefore seen in increasing footfall in their stores and in positive PR.

The recycling company would be responsible for collecting the bottles and running the waste compacting centre where the bottles are compressed for export and recycling. For every item refunded, they would claim the deposit and the defined handling fee (up to 80% of the environmental levy) back from the fund administrator (a designated not-for-profit agency). Should other collection companies be involved, the fund administrator/not-for-profit agency would have to define the handling fee on a case-by-case basis (because some collection points in highly frequented locations will have a higher collection rate whereas others will have a lower collection rate but the same hours of operation).

In order to achieve a high return rate, people should not be required to make too much of an effort to access a collection point and return their plastic bottles. As such, at least one collection point should be installed in each town and village with more than 100 inhabitants and a few more should be installed in highly frequented and tourist areas. The smaller islands should have at least one collection point per island. In total, this would amount to around 20 collection points.

Exporting plastic bottle waste by sea is an expensive option. In the stakeholder meetings, putting incentives in place for start-up recycling companies on the island (e.g. by reducing taxes) was mooted. Another possibility mentioned was to create an inter-island initiative to develop a central recycling facility on one of the islands. The retail and consumer merchandise distributor Gren Pak Limited mentioned that they already have a recycling facility in Trinidad and Tobago, which should be assessed to see if it has the capacity and qualities required to operate as a central recycling facility.



Reused tyres



Perseverance Landfill

5.4 Additional considerations

- The system should be supported by a long-term awareness-raising campaign that could be financed through the fund(s).
- If the public are made aware of the impending launch of a deposit-refund scheme, people may start hoarding their bottles until the system is introduced. To avoid this, a pre-launch phase should be incorporated where local people are offered a small rebate when returning their bottles.
- There is always the possibility that people will try to abuse this kind of system. Empty bottles may, for example, be returned twice – i.e. bottles that have already been collected in by collection point workers or handed in by foreigners are surreptitiously recirculated to obtain undue deposit refunds. Therefore, detailed controls should be carried out. Another deterrent to this practice is the stipulation that only whole bottles can be returned and that, as soon as bottles are collected in, they must be crushed.

- To avoid a situation where bottles are produced and returned before being filled, the deposit must not be set higher than the production and shipping costs.
- To avoid issuing refunds on returned bottles that are actually from abroad and for which no deposit has been paid, the deposit-refund system may need to impose a labelling scheme on imported bottles. This obligation could be passed to the importer or distributor.

As mentioned above, many countries and/or island authorities have already introduced a deposit-refund system. Although the systems vary a lot depending on the situation on the island, aspects of these systems can be used as models and exemplars for equivalent parts of the system under development.

The Bottle Bill website (<http://www.bottlebill.org>) provides an overview of countries, including island nations islands like Kiribati (102,351 inhabitants in 2013¹¹) and Iceland (323,000 inhabitants in 2013), that have already introduced a deposit-refund system. For each country, the main features of the deposit-refund system are provided.

11 See: <http://data.worldbank.org/indicator/SP.POP.TOTL> (accessed on 30 September 2015).

These links provide particularly useful examples for small island situations:

- Hawaii Deposit Beverage Container Program – <http://health.hawaii.gov/hi5/>
- Kiribati's Special Fund (Waste Materials Recovery) Act 2004 – <http://www.bottlebill.org/legislation/world/kiribati.htm> (also see Kiribati 2005 in the References)
- Micronesia's Kosrae Recycling Program – <http://www.bottlebill.org/legislation/world/micronesia.htm> (also see Leney 2005 in the References)

5.5 Implementing the deposit-refund system

In order to implement a deposit-refund system, an implementation plan needs to be drawn up detailing the steps required to set up the system.

According to Leney et al (2005), an implementation plan for setting up a deposit-refund system comprises five key elements:

1. A legislative component to ensure that the required provisions are drafted or amended.
2. A public awareness component to ensure that the public is aware of the changes.
3. A logistical component to oversee the selection of a suitable site for the waste collection centre, the procurement of equipment and the bidding procedure for waste companies.
4. A business component to operate the deposit-refund system.
5. Project support to coordinate the project.

Setting up this kind of system should take around one year.

GSWMA should coordinate the implementation of the system, whereas an implementing body, which could be the independent not-for-profit agency, should manage the finances, contract the private companies for plastic bottle collection and compacting, report to the GSWMA, and carry out awareness-raising campaigns.

In addition, a steering committee could be established to monitor and guide the overall direction of the implementation project. This committee could be composed of representatives from GSWMA, the Ministry of Agriculture, the not-for-profit agency, the private sector, donors and other relevant parties.

The first important step for GSWMA would be to draft the new legislation, amend the current legislation, and then present this work via the Ministry of Agriculture to parliament. Once the legislation is approved, the implementation plan can be carried out.

Other important steps are the establishment of a not-for-profit agency (if not carried out by GSWMA), the creation of the fund, securing donations and securing appropriate land.

Once the approach becomes more concrete, GSWMA should inform the public and the not-for-profit agency to ensure that it is aware of the changes and how to use the new system.

In Leney et al (2005), a detailed work plan for the implementation of a deposit-refund system in the Marshall Islands is provided, and this would be a useful model to refer to when drawing up the Grenada implementation plan.

6. Financial sustainability of the deposit-refund system

Taking the system described in the previous section as the model to be implemented, in this section the income and expenditure of this system are analysed to see whether it could be financed with the income it is expected to generate.

Countries that have already introduced a deposit-refund system achieve average return rates of between 80% and 90%. Therefore, a return rate of at least 80% is presumed.

In the baseline report, data are provided on the lifecycle of plastic bottles drawn from a literature review, expert information and estimations for 2013 (see Annex 1). The report also states that some of the figures obtained for 2013 – data on preform imports and the rates of separately collected and recycled plastic bottles – were based on year-specific phenomena and thus cannot be used as averages for further calculation.

- **Preform bottles**
Preform bottles made up 84.4% of the plastic bottles imported in 2013, amounting to 27.9 million PET bottles. However, the statistics for 2012 and 2014 indicate that this was a peak year because, in 2014, these numbers were already decreasing (see Annex1). Comparing data with import data received from

single import companies, an average of 15 million preform bottles (75% of all bottles) is used for further calculations.

- **Separate collection and recycling**
In 2013, the Grenadian recycling company Spice Isle Recycling (SIR) separately collected and exported 36 tonnes of PET plastic bottles (3.7%) for recycling. Bottles were collected from the Grenada Bottling Company, selected members of the Grenada Hotel and Tourism Association, marinas, the public realm, and the landfill. However, SIR stopped collecting plastic bottles from the landfill and public realm because it did not get compensated for doing so, and the income it ultimately derived from these particular sources was insufficient. At present, SIR only collects empty bottles gathered from a few of the above sites, storing them until a sufficient quantity is amassed for export. In light of these issues, stakeholders questioned estimated that 0.5% of plastic bottle waste gets separately collected and recycled and this figure has been used for the calculations in this study.

Table 1 below details the data acquired for 2013 and the figures that will be used for further calculations.

Table 1: Figures for the lifecycle of plastic bottles in Grenada for 2013 and for use in further calculations

Principal indicators	Figures for 2013	Figures used for further calculations
Amount of plastic bottles imported	990 tonnes (~33 million bottles)	604 tonnes (~20 million bottles)
Amount of preform bottles	836 tonnes (~27.9 million bottles)	450 tonnes (~15 million bottles)
Amount of blown bottles	154 tonnes (~5 million bottles)	154 tonnes (~5 million bottles)
Amount of plastic bottle waste generated	990 tonnes (~33 million bottles)	604 tonnes (~20 million bottles)
Separate collection rate for plastic bottle waste (%)	~3.7%	0.5%
Amount of plastic bottle waste recycled	36.3 tonnes (~3.7%)	3 tonnes (~0.5%, ~0.1 million bottles)
Amount of plastic bottle waste recycled	36.3 tonnes (~3.7%)	3 tonnes (~0.5%, ~0.1 million bottles)
Amount of plastic bottle waste landfilled	657 tonnes (~66.3%)	420 tonnes (~69.5%, ~14 million bottles)
Amount of plastic bottle waste unmanaged	297 tonnes (~30%)	181 tonnes (~30%, ~6 million bottles)

Incomes

To finance the deposit-refund system, 80% of the environmental levy on plastic bottles could be used. In addition, introducing the system will generate or enhance incomes through the sale of plastic bottles to recycling companies and through the redirection of unredeemed deposits retained in the deposit fund.

Working on the assumption that around 20 million bottles are placed on the market in Grenada and that an environmental levy has been paid on each one, 80% of the environmental levy of XCD 0.25 will provide around XCD 4 million of funding. Currently GSWMA receives the environmental levy for fully blown bottles of around XCD 1.3 million to use for waste management. According to the legislation, 80% of this levy must be rebated to the importers that take back and recycle or export empty bottles. At present, however, importers do not claim the rebate. With the rebates redirected to the deposit-refund system, GSWMA would have to pay about XCD 1 million into the system's fund, thereby reducing their current income. To counter this, one solution is to adopt the recommendation on extending the environmental levy to bring preform bottles into the deposit-refund system. In so doing, the income from the environmental levy would increase to a total of around XCD 5 million. With 80% of this income paid into the deposit-refund system's fund, GSWMA would still have the XCD 1 million it needs to tackle waste management issues.

More income will be earned from the sale of recyclable materials to recycling companies. At present, recyclables go to China, but it is hoped that regional or on-island facilities will be developed to recycle these materials. Spice Isle Recycling reported that the Chinese currently pay USD 350 per tonne of post-consumer plastic bottles. If 80% of the 604 tonnes of bottles imported and placed on the market are collected back through the deposit-refund system, the income from selling plastic bottle waste to recycling companies in China would generate around XCD 460,000.

Another additional source of income to fund the deposit-refund system is the unredeemed deposits retained in the system's fund. If deposits are not reclaimed on 20% of the plastic bottles imported, around XCD 400,000 will be left

in the fund each year, which could be used to fund the system's operations. This amount does, however, substantially depend on the success of the deposit-refund system and the return rate achieved.

In total, an income of about XCD 5 million could be achieved by running a deposit-refund system as described in Table 2 below.

Table 2: Estimated incomes from the deposit-refund system

Type of income	Income in XCD
80% of the environmental levy	4,030,000
Sale of plastic bottle waste to recycling companies	460,000
Unredeemed deposits	400,000
Total	4,890,000

With more recycling occurring, the costs of landfill, waste collection, street cleaning and clean-up operations would be reduced. Working on the assumption that 80% of the plastic that is currently sent to landfill is, instead, returned to collection points, some 363 tonnes of plastic bottle waste could be diverted from the landfill each year. Reduced landfill volumes will extend the life of the existing landfill site and reduce the pressure for finding a new site. These effects will be relatively low as plastic bottles are only one small fraction of the total waste produced. However, this could be increased if the deposit-refund system were extended to include other kinds of beverage container and waste fraction.

In addition, costs for clean-up operations can be reduced and resources saved through the recycling of plastic bottle waste and its conversion into new products.

The tourism sector and fishing industry would also very likely benefit from the introduction of a deposit-refund system as the beaches and the marine environment would become cleaner.

Expenditure

Besides the expected additional incomes, there are considerable expenses involved in establishing and running a deposit-refund system.

Major upfront investment is required to cover the costs of establishing collection points and the collection centre and of procuring machinery to crush and bale the empty bottles and trucks to transport materials from the collection points. The equipment could be owned by the state, the not-for-profit agency or the collection company. Sources of funding to cover these upfront costs need to be identified and evaluated. To source finance for the equipment, funding could be sought from the private sector, other institutions or international organisations like the SCCF.

Major regular outgoings will be the wages of the workers running and maintaining the deposit-refund system. According to data provided by stakeholders, average salaries stand at around XCD 18,000 per year for labourers, XCD 36,000 per year for truck drivers and XCD 48,000 per year for operations managers. If 20 collection points are established, requiring four labourers, two truck drivers and two managers, the total required to cover employee salaries would be XCD 600,000 (see Table 3). Note that this is merely an estimate. The exact numbers of workers and managers would need to be determined when designing the system in more detail. If a not-for-profit agency is set up then additional staff costs will need to be met.

As mentioned earlier, shipping is costly, as evidenced in the data on shipping costs provided by one stakeholder. If 483 tonnes of plastic bottle waste is collected and shipped (80% of used plastic bottles), the total shipping costs would be XCD 137,000 (see Table 4).

Table 3: Estimated salaries

Position	Labourer	Driver	Collection point operator	Manager
Number required	4	2	20	2
Salary/year (XCD)	18,000	36,000	18,000	48,000
Total (XCD)	72,000	72,000	360,000	96,000

Table 4: Estimated shipping costs

Type of service	Cost: USD/ container	Conversion factor from USD to XCD	Cost: XCD/ container	Conversion factor: container/ tonnes	Cost: XCD/ tonne	Total costs
Transport	400	2.7	1,080	20	54	26,104
Lifting	200	2.7	540	20	27	13,052
Costs of shipping to China	1,500	2.7	4,050	20	203	97,889
Total						137,044



Waste collection centre

Other costs to consider are the operating costs involved in running the collection points, vehicles and centre and the not-for-profit agency as well as the costs of land rents and insurance. Since this data varies significantly depending on the detailed structure and design of the system, it has not been possible to calculate operating costs at this stage.

The balance of income against expenditure depends on the amount of unredeemed deposits and on how high the handling fee is pegged (up to 80% of the environmental levy). It is expected that total income will be greater than total expenditure. The handling fee should be high enough so that all outgoings, including for the awareness-raising campaigns, can be covered. Setting the appropriate level for the handling fee will depend on the exact design of the deposit-refund system and the return rate.

7. Economic, social and environmental impacts

It is widely known that deposit-refund systems, where correctly introduced and managed, offer many advantages for government, business and the wider community. This chapter sets out and, as far as possible, quantifies the economic, social and environmental impacts for Grenada.

7.1 Environmental impacts

As described in the previous section, some 20 million plastic bottles are estimated to be imported and consumed yearly in Grenada, amounting to 604 tonnes. Each year, around 30% of that amount (181 tonnes) remains unmanaged and ends up littering the land environment and thus potentially the ocean. Up to 0.5% are recycled. Some plastic bottles are directly disposed of into the sea, but even used bottles littering the island can end up in the sea through wind and rain action. According to stakeholder information, all unmanaged waste will eventually end up in the sea because of the geological and hydrological conditions on the islands. In addition to the plastic bottles that are littered, a certain amount of the plastic bottles disposed of in the open landfill, which is located adjacent to the coast, are also estimated to end up polluting the marine environment every year. Although clean-up operations are already carried out, the amount of plastic bottles with the potential of ending up in the sea is still deemed to be very high.

Plastic materials, including plastic bottles, are highly durable products that harm the marine ecosystem

- by injuring and killing marine wildlife through entanglement and digestion;
- by destroying marine habitats like coral reefs through alteration, degradation or destruction; and
- through the adsorption of pollutants and bio-accumulation that has implications for the food chain (UNEP 2011).

To minimise or stop these negative impacts, it is therefore very important to decrease the amount of plastic (bottle) waste that enters the marine environment. The

introduction of a deposit-refund system with an estimated return rate of about 80% could prevent around 80% of this unmanaged waste. Yearly, this equates to 145 tonnes of post-consumer plastic bottles that do not end up littering the island environment and potentially its seas. The numbers of plastic bottles that eventually end up in the sea would be reduced even further if measures were put in place to prevent waste from entering the sea directly from the landfill. Furthermore, this estimation does not take into account the amount of littered waste that is collected by the informal sector and returned to collection points. With regard to environmental concerns, implementing the deposit-refund system would help to reduce plastic waste's manifold negative impacts on marine ecosystems and species and on human health.

7.2 Economic impacts

The introduction of the deposit-refund system would have different economic impacts on the different stakeholders and sectors involved.

Importers of pre-blown plastic bottles would not be noticeably affected because their levy contributions would hardly change. They would lose the option of an 80% levy rebate on the plastic bottles they return but, to date, none of these companies has made use of this option.

Importers of preform bottles would have to pay an additional 25 cents (XCD) per plastic bottle. As described in Section 4.2, importers of preform bottles argue that preforms are exempted from the environmental levy because their manufacturing costs are incurred on the island. In their opinion the introduction of the environmental levy would have negative impacts for the manufacturing of plastic bottles on the island. They do, however, pay less for preform bottles than for fully blown bottles and their shipping costs are also lower given the reduced volumes involved. A major decrease in the number of plastic bottles imported is not expected. According to stakeholder information, GSWMA is already considering extending the environmental levy to include preform bottles. The exact impacts of such a move would need further examination.

Jobs would be created at GSWMA or the independent not-for-profit agency as more staff would be needed to organise the fund and collection system, the payment of the collection system, and the awareness-raising campaigns.

Further jobs would be created in the waste management sector, with new staff required to run the collection points and collection centre. The installation of 20 collection points is proposed along with a collection centre where the collected waste is prepared for subsequent export or recycling. In addition, drivers are required to truck the plastic bottles from the points to the centre. In total, more than 25 new jobs would be created. If incentives were put in place to prompt recycling companies to set up shop in Grenada and recycle bottles on the island, additional companies and jobs could be created. Considered in terms of the island's overall waste output, these plastic bottle waste reductions are very small, so their impact on the workloads of those operating mixed waste collection, landfill sites and clean-up activities would not be sufficient to cause job losses.

An informal sector that collects and sells valuables already exists in Grenada, but not for plastic bottles. Therefore, new income streams will most likely be created for informal waste collectors who will be able to earn extra money by collecting plastic bottles and handing them in to collection points.

Further positive impacts are expected for the tourism sector (hotels, restaurants, supermarkets) because improved waste management means cleaner beaches, landscapes and marine environments. The PR activities delivered as part of the awareness-raising campaigns could also drive up the number of visitors to Grenada.

Supermarkets will not experience any negative impacts as they will not be obliged to take back the plastic bottles.

Consumers may see the prices of certain beverages rise due to the additional costs involved in using preform bottles.

7.3 Social impacts

As described above, new administrative and, in particular, waste management jobs would be created, which will undoubtedly benefit Grenadian society.

The reduction of plastic bottle waste would lead to cleaner beaches, marine environments, road sides and scenic locations, increasing Grenada's quality of life and attracting more and new tourists to the island.



8. Further recommendations for improving waste management performance and financing

8.1 Moving towards a self-financing waste management system

The waste management system in Grenada is already fairly well established but, currently, expenditure is still higher than income (see Table 5).

Table 5: Income and expenditure of Grenada's waste management system

Income	XCD	Expenditure	XCD
Levy for importers	3,600,000 (for all concerned goods including plastic bottles)	Sales, general and administrative expenses	900,00
Levy for households	2,200,000	Landfill operations	1,500,00
Levy for tourists	1,200,000	Waste collection and street cleaning	6,900,00
Fines	n/a	Public relations	100,00
Totals	7,000,000		9,400,000

Most of GSWMA's current income is derived from the levy for importers. In the legislation, importers can claim an 80% rebate of the levy under certain conditions (see Annex 1). However, as it stands, importers do not act to meet these conditions, so the levy income is left with GSWMA, which uses it to fund waste management services. As such, if the unclaimed levy rebate were instead used to finance the deposit-refund system, GSWMA's income would be further reduced.

It is therefore very important to close the gaps in the current financing system and to increase GSWMA's revenues in order to move further towards a self-financing waste management system.

The following reasons for gaps in the financing system have been identified:

- Tipping fees for the commercial sector are defined in the National Waste Management Act, but they are not enforced for fear of promoting increased illegal waste dumping and littering. The commercial sector currently does not pay a waste levy because this sector is exempted from the public waste collection service. Most businesses (mainly small enterprises) simply put their waste out on the street next to household waste and thus make use of the public waste collection system without paying for it.
- The levy for importers is already fairly high, although they can get an 80% rebate if they manage the waste resulting from their imports in an environmentally sound way. This scheme does not cover preform bottles, which are blown and filled by a number of companies in Grenada and which make up around 75% of the overall number of plastic bottles imported.

- The option to hand out fines for littering is already provided for in Grenada's Anti Litter Act, but such fines are scarcely issued.
- Households with electricity consumption below 100 kilowatt hours per month (45%) are exempted from the general waste management fees and households required to pay for these services are charged very little, especially in relation to the high costs involved in operating the services (see Annex 1).

The limited income that GSWMA generates means that there is no money available to introduce and pay for cost-intensive instruments for improving waste management. Closing the existing gaps in the levy system and increasing the income GSWMA can generate is therefore important. This can be achieved in the following ways:

- Extend the levy beyond households to include the private sector (businesses and hotels), possibly by imposing a fixed monthly fee (which minimises any incentives to fly-tip) set according to the amount of waste they produce (in Cozumel, for example, levies for hotels and supermarkets are set from USD 200 per year up to USD 5,300 per month). Many of Grenada's larger companies have already contracted with private contractors. Therefore, another possibility would be to extend the levy for households to include small shops and businesses and to set certain conditions that bigger companies must meet. These conditions should include the use of a qualified contractor for waste collection and disposal and the payment of tipping fees.
- Extend the environmental levy to include preform bottles.
- Enforce the new Anti Litter Act, which has already been adopted by the government and will be made public in the near future (see Annex 1).
- Increase household waste management fees a little and begin charging households that consume less than 100 kilowatt hours per month.

8.2 Improving waste management performance

Further measures could be carried out that, according to the information provided, would improve waste management performance in Grenada:

- Increase the amount and density of closed public waste bins and waste collection points (for plastic waste/plastic bottle waste).
- Develop and roll out more awareness-raising campaigns.
- Design landfills so that waste does not end up being blown or carried off site by wind and rain action, animals and so on.
- Expand street cleaning services to include Grenada's south-western commercial centre of Grand Anse.

The data on plastic placed on the Grenadian market in 2013 revealed that 24.8% of plastic packaging comprises plastic bottles and 20.2% is plastic bags (see Annex 1). Stakeholder consultations also highlighted that styro-foam food packaging and plastic bags are a problem in Grenada because they are so commonly used. Moves to ban styrofoam are already being discussed and a number of supermarkets are already trialling replacements. Like the requirements in place for the EU,¹² it would certainly also make sense to introduce certain obligations for the use of plastic bags to further reduce the chance of used plastic packaging ending up in the sea.

12 See: Directive (EU) 2015/720 of the European Parliament and of the Council of 29 April 2015 amending Directive 94/62/EC as regards reducing the consumption of lightweight plastic carrier bags, <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32015L0720> (accessed on 2 October 2015)

9. Conclusion and outlook

Conclusion

The analysis of the actual situation of plastic bottle waste management in Grenada has shown that the introduction of a deposit-refund system would be a viable and practical solution for the islands. It would contribute significantly to reducing the amount of plastic bottle waste that ends up in the sea and, as such, would contribute to protecting the marine environment. Since a similar local system already works well for glass bottles, it can be expected that local people will accept such a scheme and be very willing to cooperate. As an environmental levy is already in place, it will be easier to fund the set up and operation of the deposit-refund system. However, as it stands, the levy system is poorly conceptualised, so, to make it more effective, it will need to be overhauled. Balance sheet estimates show that the income derived from the deposit-refund system will likely outweigh its set-up and operating costs — especially when taking a long-term view. This being the case, the system for managing plastic bottle waste has the clear potential to become self-financing and self-sustaining.

Besides environmental advantages, the implementation of a deposit-refund system will create further economic and social advantages, such as new jobs and additional incomes for Grenada.

Extending the system to include other beverage and packaging products in future was also strongly recommended in discussions. However, before introducing the system, a detailed feasibility study should be carried out to ensure that the system is correctly introduced and that its design is carefully tailored to the local context.

Outlook

Although a deposit-refund system would be able to reduce the amount of waste being sent to landfill to a certain extent (and the system could also be extended to include other beverage containers), the majority of waste will still be delivered to the landfill and the littering of other recyclables will continue. So, on its own, this instrument will not be able to put an end to marine littering and neither can it divert substantial quantities of waste from the landfill (which is urgently needed and a top priority for Grenada). That said, it constitutes a vital first step and puts in place the incentives needed to restructure the current waste management system. If delivered in tandem with the expected enforcement of the newly amended Anti Litter Act, the amount of waste littered on the island can certainly be reduced.

As a mid-term objective, a system for separate waste collection at source should be established. Some of the island's hotels (among others, Le Phare Bleu) have already begun separating their recyclables and have indicated an interest in setting up their own company to collect and, if possible, recycle valuables. Regarding separate collection at source, the openness of hotels, restaurants and supermarkets to agree to voluntary initiatives on the separate collection of plastic bottle waste would need to be assessed. Their adoption of separate waste collection can, after all, be used to boost their environmentally friendly credentials. The collection company SIR has already contracted with hotels to collect their recyclables including plastic bottles, and this approach could be rolled out more widely to include other businesses. The deposit-refund system for plastic bottles could operate alongside the system for the separate collection of valuables (e.g. glass, plastic, paper, metals) at source.

In light of the amount of waste being sent to landfill, the Government of Grenada has been looking at the possibility of establishing a waste incineration plant, which would also reduce electricity generation costs (Rothenberger 2015). However, to make incineration effective, the facility must always operate at capacity. A better solution, taking into consideration resource efficiency, would be to introduce the at-source separation of recyclables and, at the same time, build a mechanical biological treatment plant with a fermentation facility to generate power using the biodegradable waste. This kind of unit is also a better option when dealing with smaller operating capacities.

Currently, Grenada is working on closing its existing landfill and building a new cell, funded by the Caribbean Development Bank (CDB). A precondition of this funding is that Grenada must update its National Waste Management Strategy. Therefore, the Clinton Foundation is providing an expert on a pro-bono basis to analyse the current waste management situation and develop a holistic waste management concept that diverts waste from the landfill and increases recycling and the reuse of valuables. This concept will also include the separation of waste at source.

During this project, information has been exchanged with the Clinton Foundation consultant who is also in favour of a deposit-refund system for plastic bottles. The deposit-refund system could therefore be integrated into the Grenada National Waste Management Strategy.



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11. Annexes

11.1 Annex 1: Excerpts from Roberts’s Baseline Report (2015)

Plastic Bottle and Packaging Waste Stream and Management

Total amount of plastic bottles produced in the country
Plastics bottles are not produced in Grenada. Rather, they are imported as discussed below.

Total amount of plastic bottles imported

Various companies import plastic bottles into Grenada, as fully blown bottles or as preforms,¹³ which are blown and filled on the island. On importation, all preforms and plastic bottles used for water and beverages are charged a mandatory fee at the port of entry, equivalent to an overall value of 39.17% of the CIF¹⁴ of the product. These monies are forwarded to the consolidated fund managed by the Ministry of Finance. In addition, all plastic and glass bottles used for the above purpose are charged an environmental levy; this levy however, is not imposed on preform bottles.

Table 6: Summary of the number of preforms and plastic bottles imported into Grenada, 2012–14 (Customs and Excise Division 2015)

	Preforms	Plastic bottles
Year	Quantity	Quantity
2012	3,522,671.00	2,235,032.04
2013	27,864,983.75	5,141,681.96
2014	10,282,424.28	4,602,448.20

¹³ Preforms are small bottles that can be heated and blown to a larger size. They are used in Grenada by water and beverage companies due to their flexibility and reduced importation cost. They correspond to HS Codes 39323010 and 39232900.

¹⁴ Cost including freight.

Table 6 summarises the quantity of preforms and plastic bottles imported during the period 2012–14 (Customs and Excise Division 2015). Some inconsistencies were observed in the data obtained from the Customs Division and were generally not included in this report.¹⁵ According to Customs officials this could be attributed to the self-reporting nature of the data collection process, which could introduce bias into the overall data and information management system. Further to this, effort to secure importation data from importers also proved challenging, notwithstanding the difficulty in verifying the information from this source. Within the context of the above uncertainties, interpretation of the information presented on the importation of plastic bottles and preforms should be viewed cautiously.

In the baseline year of 2013, a total of 27.9 million preforms were imported, all of which were PET.¹⁶ As revealed by the data, the total quantity of imported preforms increased by 691% in 2013 (27.9 million) compared to 2012 (3.52 million).¹⁷ This is possibly due to the replacement of glass bottles with preforms by a major beverage bottling company, and significant increases in annual imports by other water companies. In contrast, the number of imported preforms declined by 63.1% in 2014 (10.3 million), indicating a possible stabilisation of importation rates in subsequent years.

In addition, a total of 5.14 million plastic bottles were imported into the nation in 2013. While the exact ratio of PET versus other types of plastic is unknown, stakeholders reported that a sizeable percentage of these bottles were highly likely PET plastics. Further to this, importation of plastic bottles showed an increase of 130% from 2012 (2.23 million) to 2013 (5.14 million), with a slight

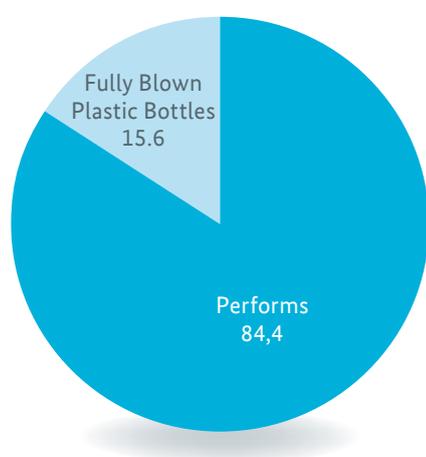
¹⁵ Mass and values were also provided by the Customs and Excise Division. However, the data set – especially the mass data – were inconsistent and seemed to be incorrect in relation to the quantity. The numbers of bottles seemed to be more accurate compared with the limited information provided by the importing companies and is therefore provided in this report.

¹⁶ Polyethylene terephthalate.

¹⁷ This could be accredited to the increased imports of preforms by bottling companies that previously used bottles.

drop in 2014 (4.6 million). In 2013, a total of 33 million- preforms and fully blown plastic bottles with a total mass of 990 t¹⁸ were imported, of which the majority (84.4%) were the former (refer to Figure 4).

Figure 4: Proportion of preforms and plastic bottles imported into Grenada in 2013



Total amount of plastic bottles exported from the country
Few or no plastic bottles are exported from Grenada.

Stakeholders speculated that there might be two entities involved in plastic bottle collection and export. Evidence was only obtained for one company involved in this activity: Spice Isle Recycling (SIR). The company started operations in 2013. It focuses on the collection and subsequent export of a range of recyclable products, including PET plastic bottles, cardboard, scrap metal, used engine oil, aluminium cans and batteries. With respect to PET plastic bottles, the company works primarily with eco-oriented hotels involved in the waste separation of this material.

¹⁸ According to importers, at least three sizes of preforms are imported as outlined: 5 litre (80 g), 1.5 litre (37 g), and 0.5 litre (16–18 g). Information on the share of the different sizes imported is unavailable. It is estimated, however, that the majority of imported bottles are 0.5 litre bottles, which is also consistent with estimations from other studies. An average of 30 g per bottle is used in further analysis in this report.

In 2013, SIR exported an estimated 40 tonnes (36,287.4 kg) of PET plastic bottles to China, equivalent to 3.7% of the share of plastic bottles and preforms placed on the market during the calendar year. Bottles were collected from the Grenada Bottling Company (GBC), selected members of the Grenada Hotel and Tourism Association, marinas, public places and from the landfill. The recycling company has currently ceased the collection of plastic bottles from the landfill, public places and the GBC. At present, SIR collects and stores empty bottles from a few of the above sites, until a sufficient quantity is acquired for export. Operation and profitability of this enterprise is, however, constrained by a number of factors as listed below:

- low demand for plastic on the international market, with associated low prices;
- the high cost of shipping and transportation (SIR's owner reported an average cost of USD 1,600–1,900 for local trucking and the international shipping of two 20-tonne containers in 2013;
- no monetary value is assigned to the bottles;
- inadequate awareness of the importance of recycling among the populace; and
- a lack of incentives from Government to operate the system.

Total amount of plastic bottles placed on the market

Based on production, import and export data, an estimated 33 million plastic bottles including preforms were placed on the market in 2013 (refer to Table 6).

Total amount of plastic packaging products placed on the market

An analysis of all plastic packaging products with HS 39 and related codes imported into Grenada in 2013 is summarised below. As illustrated by Table 7, a total of 3,988 t (3,988,324 kg) of plastic material was imported in the State in 2013.

Table 7: Summary of all plastic products imported in Grenada in 2013 (Central Statistics Office 2015c)

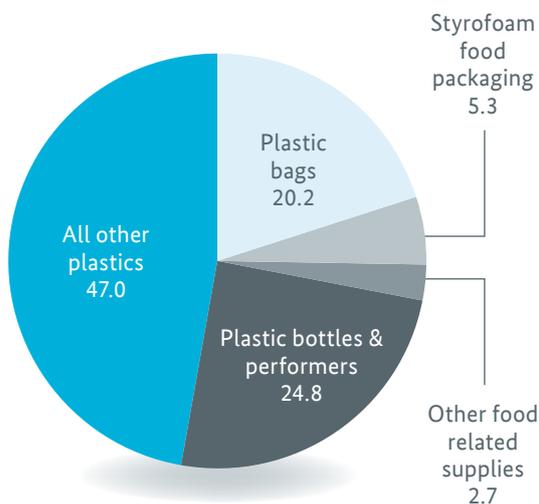
HS Code	HS Indicators	Mass/kg
PLASTIC BAGS		
39232100	Sacks and bags (including cones): of polymers of ethylene	380,313.35
39232110	Poultry bags imported for use by bona fide farmers	—
39232900	Sacks and bags of other plastics	419,708.58
Sub-total: plastic bags		800,021.93
STYROFOAM FOOD PACKAGING		
39231090	Other (styrofoam boxes)	191,793.53
39239090	Other (styrofoam)	21,425.57
Subtotal: styrofoam food packaging		213,219.10
OTHER FOOD-RELATED SUPPLIES		
39233010	Cups, forks, knives, plates, spoons and tumblers	99,936.04
39241020	Drinking straws	9,067.81
Subtotal: other food related supplies		109,003.85
PLASTIC BOTTLES AND PREFORMS		
39323010 and 39232900	Preforms	835,950
20091120, 20099090, 22019010, 22021010, 21069010, 21069020 and 22087002	Plastic bottles	154,250
Subtotal: plastic bottles and preforms		990,200
ALL OTHER PLASTICS		
39011000 to 39269090		1,875,880.02
TOTAL		3,988,324



Styrofoam food packaging

Further analysis revealed that plastic bottles and pre-forms (24.8%) constituted the second largest share of plastic products placed on the market during the baseline year after all other types of plastics (47.0%). Other notable contributions were plastic bags (20.2%), styrofoam food packaging and other food related supplies (8.0%).

Figure 5: Share of the types of plastic by weight placed on the Grenadian market in 2013 (Central Statistics, 2015; Customs and Excise Division, 2015)



2.4.2 Statistics on Plastic Bottle Waste

The total waste delivered to Perseverance Landfill amounted to 31,100 tonnes in 2013, representative of a slight increase compared to the previous years. According to a waste characterisation study carried out in 2009 about 16% of the total waste was plastic waste. This would amount to about 5,000 tonnes landfilled, assuming that the total amount of waste is even higher, since part of it remains unmanaged. According to import statistics, about 4,000 tonnes of plastic materials were imported into Grenada in 2013. These datasets make it impossible to estimate loopholes between the import and the disposal of plastic packaging waste and plastic bottles. Therefore, for further calculation, it is estimated, that the amount imported equals the amount generated as waste. The amounts of plastic packaging waste and plastic bottle waste remaining unmanaged were estimated by experts. Table 8 provides estimates of important indicators on plastic bottle waste.

Table 8: Key indicators on plastic bottle waste in baseline year 2013²¹

Principal indicators	Details
Total amount of plastic packaging waste (PPW) generated	3,988,323 kg
Share of plastic bottle waste generated	24.8%
Amount of plastic bottle waste generated	33 million bottles ~990,200 kg
Total amount of plastic bottle waste generated per capita	9.2 kg/capita
Separate collection rate for PPW (in %)	There is no formal separate collection for PPW in Grenada.
Separate collection rate for plastic bottle waste (%)	~3.7% were collected by SIR in 2013
Recycling or reuse rates of plastic bottle waste (%)	In 2013, recycling using an external facility was 3.7% based on export data provided by SIR; information on reuse rates is unavailable (see Section 2.4.1). While there is no available data to substantiate rates of reuse, culturally there is considerable reuse of plastic bottles, particularly as a water or beverage container, and in the production of craft items. A recent trend is the reuse of PET plastic bottles for packaging coconut water for local sale. Though negligible, approximately 15–20 persons are involved in this informal sector.
Recovery rates of plastic bottle waste including incineration with energy recovery (in %)	0% — Grenada is not involved in waste-to-energy recovery initiatives.
Incineration rates of plastic bottle waste (incineration without energy recovery)	0%
Share of plastic bottle waste landfilled (in %)	66.3% ²² (It is roughly estimated that on average about 70% of plastic bottle waste, 75% of PPW and about 85% of municipal solid waste is landfilled. Data are not actually collected on these indicators.) ²³
Share of plastic bottle waste unmanaged (%)	Estimated 30% ²⁴ — evidenced by littered bottles in various locations and the quantities of bottles collected during clean-up activities.

19 These data are based on estimates.

20 It is roughly estimated that about 70% of plastic bottles are landfilled. In 2013 about 3.7% of plastic bottles were collected from the landfill, public bins, etc., thereby reducing the amount of plastic bottle waste landfilled.

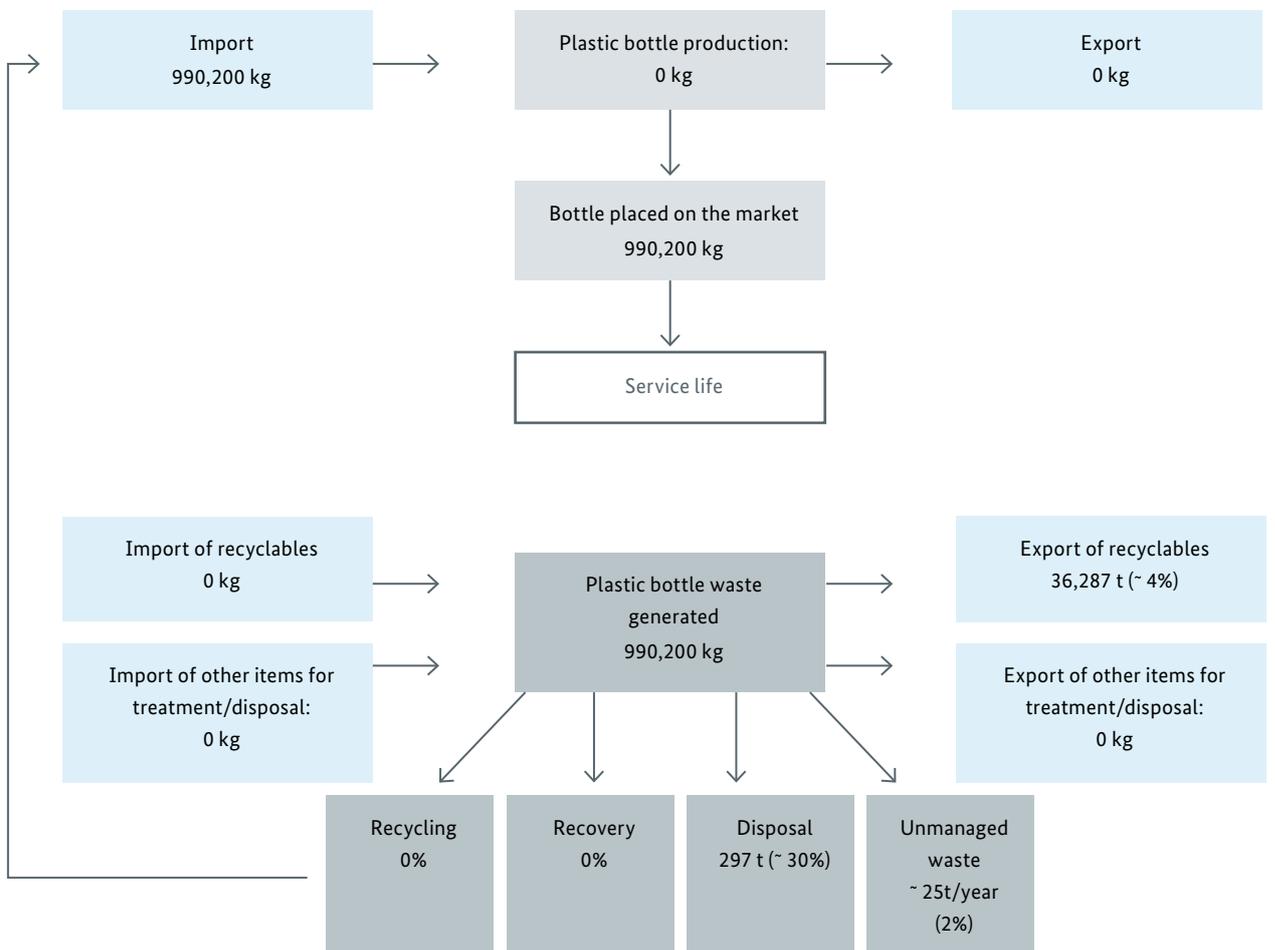
21 Estimation made by senior official at GSWMA.

22 Estimation made by senior official at GSWMA.

Material flow

Figure 6 below describes the lifecycle of plastic bottles in Grenada based on the data recorded for 2013.

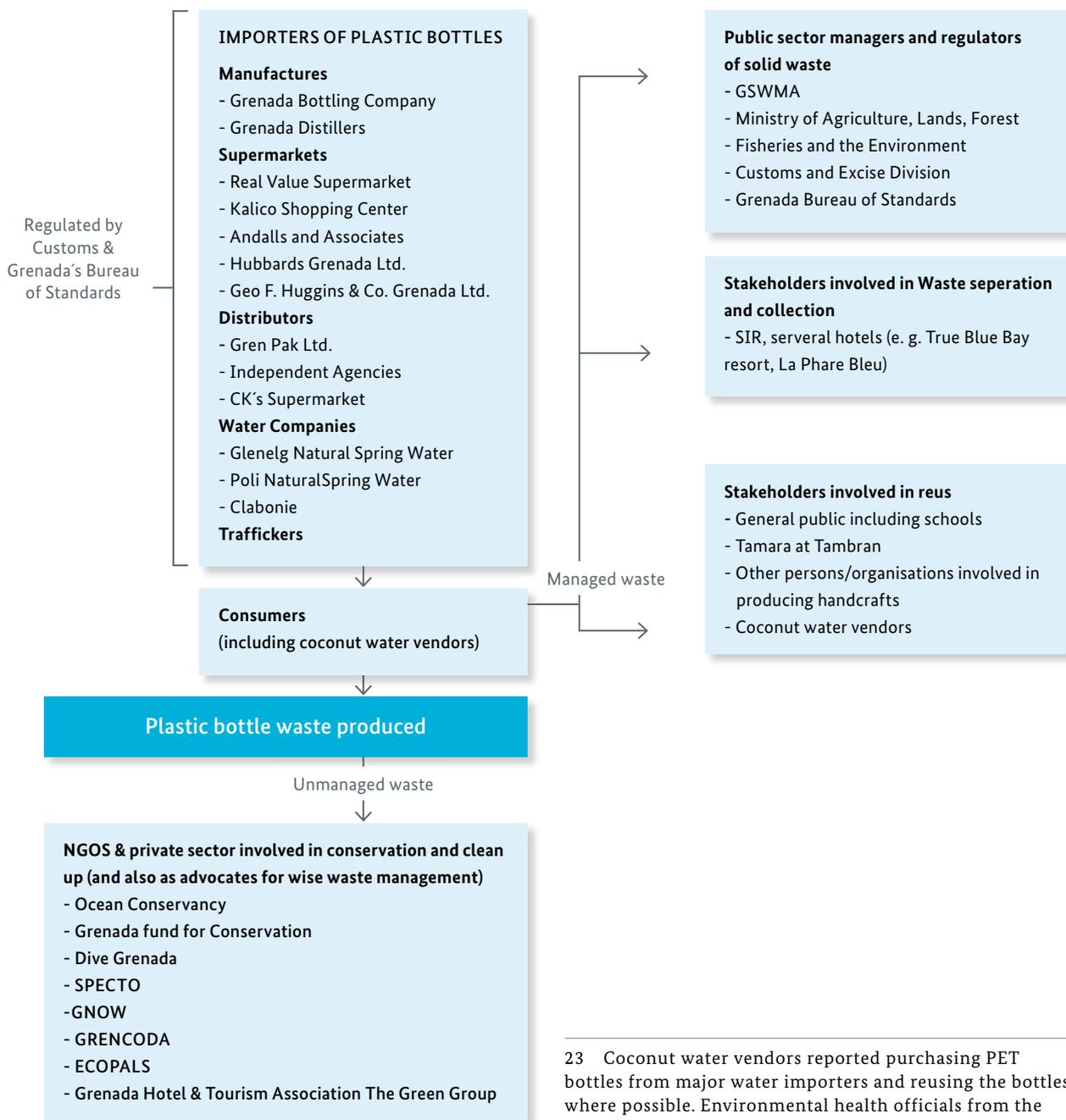
Figure 6: Material flow of plastic bottles in Grenada in 2013



Stakeholders

A range of stakeholders is actively involved in the importation, distribution, sale and use of plastic bottles in Grenada.²³

Figure 7: Plastic bottle stakeholder map



²³ Coconut water vendors reported purchasing PET bottles from major water importers and reusing the bottles where possible. Environmental health officials from the Ministry of Health indicated that they are unaware of any policy or mechanism in place to manage this kind of bottle reuse by entrepreneurs (Worme, 2015).

Features of plastic packaging waste management in Grenada

Legislative framework

Four main pieces of legislation govern solid waste management, with implications for plastic waste as outlined below:

1. **Grenada Solid Waste Management Act No 11 of 1995**, amended (Act No 30 of 1995) is an act to establish GSWMA for the purposes of developing solid waste management facilities and improving the coverage and effectiveness of solid waste storage, collection and disposal in Grenada. Refer to Appendix 2 for the duties and functions of GSWMA. (<http://laws.gov.gd/>)
2. **Waste Management Act No 16 of 2001** is an act that provides for the performance of waste management in conformity with best environmental practices, and for related matters. Section 3 of the Act makes provision for the development of a national waste inventory to be revised every five years. The last waste characterisation study was completed in 2009, indicating non-compliance with Section 3. Section 4 requires the development of a national waste management strategy, which should include among other things:
 - a review of national waste diversion and reduction options;
 - an implementation programme
 - that outlines mechanisms, programmes, policies and strategies to ensure that waste management is carried out in a manner that does not adversely impact on human health and the environment, and
 - that integrates
 - measures for addressing the illegal dumping of waste including litter and derelict vehicles,
 - financing and cost recovery mechanisms to ensure the financial viability of all waste management activities, and
 - effective public awareness campaigns and education programmes.

Further to this, Part V of the Act addresses illegal waste disposal. In particular, Section 32 (3) notes that a person who generates waste and discards the material in a manner contrary to the Act as specified in Section 32 (1) commits an offence, the penalty of which is XCD 20,000 or imprisonment for three months. In addition, Section 33 (1) notes that a person commits an offence if he/she knowingly disposes of litter and other waste inappropriately. Such an individual is liable to a fine of XCD 50,000 or six months' imprisonment.

Enforcement of the above instrument is very weak due to a number of factors, including a lack of relevant regulations, cultural acceptance of illegal waste disposal among certain segments of the population, the close-knit nature of communities, inadequate monitoring by and prosecution capacity of enforcement agents, and the unrealistically high fines imposed.

Section 38 mandates that industrial, commercial, agricultural and institutional waste generators should make arrangements for the management of waste and must ensure that waste does not present a risk to human health, safety or the environment. The enforcement of this part of the Act is sorely lacking. While the exact magnitude is unknown, a significant percentage of commercial operators do not comply with the above stipulations. Rather, they dispose of waste, sometimes inappropriately, in or around bins in major towns and/or place waste in bins designed primarily for household waste collection (see Section 2.2). Other matters addressed by the Act of relevance to this study include waste storage requirements (Section 35).

3. **Environmental Levy Act No 5 of 1997**, amended (Act No 12 of 2000 and Act No 13 of 2007) makes provision for the imposing of an environmental levy on persons, goods and services as set out in the Third Schedule. A levy of XCD 0.25 is imposed on beverage containers²⁴ imported into Grenada, to be paid to the Comptroller of Customs by the importer. Section 5 stipulates that the proceeds of the levy collection shall be paid over to GSWMA within 30 days after such collection or within such further period as the Minister permits in writing. The Act provides a mechanism for refund to the im-

24 Glass, plastic or other.

porter if there is satisfactory proof to the Comptroller of Customs that the importer

- re-exported the beverage container, or
- disposed of it in a manner acceptable to GSWMA.

Once the above conditions are met, the importer shall redeem a refund of 80% of the levy paid (XCD 0.20). The remaining 20% (XCD 0.05) is used together with other fees collected for the operation of GSWMA. Dur-

Further to the above, each stay-over and marine visitor as stipulated by the Act is charged

USD 1.50 (XCD 4.05) as a one-off fee on entering Grenada. Table 10 outlines the fees collected from visitors during the five-year period spanning 2010 to 2014. Consistent with the decline in visitor arrival, fees decreased almost consistently during the first four years, and began an upward trajectory in 2014 as illustrated by the table below. A total of XCD 1.5 and XCD 1.86 million were collected from visitors during 2013 and 2014.

Table 9: Environmental levy collected on plastic bottles, 2012–14 (Customs and Excise Division, 2015)

Year	Environmental levy collected/XCD
2012	547,919.38
2013	826,058.24
2014	808,581.60
Annual average	727,519.74
Total collected in period	2,182,559.22

In addition, householders whose electricity consumption is between 100–150 kilowatt hours (kWh) per month, will be charged XCD 5.00 compared to a charge of XCD 10 for all households that exceed 150 kWh. Householders using less than 100 kWh will not be charged. All charges will be included in the client's monthly electricity bill. According to Grenada Electricity Services (GRENLEC), on average, 45% of all households consume less than 100 kWh of electricity per month, compared with 35% consuming greater than 150 kWh (refer to Table 11).

Table 10: Environmental levy collected from visitors, 2010 to 2014 (GSWMA 2015a)

Type of visitor	Years/XCD				
	2010	2011	2012	2013	2014
Cruise passenger	333,447	310,438	247,316	196,115	243,696
Marine visitor	1,350,460	1,257,274	1,001,630	794,266	986,969
Airline passenger	93,395	101,643	100,612	100,472	124,743
Stay-over visitor	378,250	411,654	407,479	406,912	505,290
Total fees collected/XCD	2,155,552	2,081,009	1,757,037	1,497,765	1,860,718

ing the period 2012 to 2014, the environmental levy collected on plastic bottles averaged XCD 727,519.74²⁵ each year (refer to Table 9).

Table 11: Average monthly household electricity consumption in Grenada (GRENLEC, 2015)

	< 100 kWh	100–150 kWh	> 150 kWh
Average %	45	20	35
Average number of customers	18,000	8,000	14,000

Box 1 summarises the areas where the implementation of the Environmental Levy Act has been successful and where it has faced challenges.

4. The Draft Abatement of Litter Bill of 2015 (regulated under the Abatement of Litter Act Cap 1, 1974, amended 1990) makes provision for the control and punishment of littering in public places and other related matters.

It provides for a fixed penalty system similar to that used under the Road Traffic Act CAP 289A and the Value-Added Tax Act Cap 333A. The fixed penalty for natural persons is XCD 150 compared to XCD 500 for corporate bodies. The Act makes provision for the administration of the penalty system by Litter

Prevention Wardens (LPWs) to be appointed by the Minister responsible for the environment. Members of the Royal Grenada Police Force (RGPF), public health inspectors and forest officers would be authorised ex-officio LPWs. The Bill imposes an obligation on owners of vehicles, including those for hire, to install receptacles to ensure that passengers appropriately dispose of any litter.

While an improvement to the last amended bill, this instrument does not adequately address littering in inland wetland systems, and in nearshore/territorial waters. The Ministry with responsibility for the Environment has made recommendations to ensure the appropriate inclusion of marine litter control in the final Act.

Box 1: Administration of the Environmental Levy Act – What works, what does not?

Strengths

- All levies are administered with the exception of the haulage and tipping service fees, which should be paid to GSWMA by owners or operators of business.
- Monies are routinely collected and submitted to GSWMA.

Challenges

- The act is restrictive in its definition of plastic, and does not cater for the importation of preform plastic bottles, which is becoming a preferred product imported by major water and beverage production companies.
- Only the importer is authorised to receive a refund subsequent to the re-export and/or appropriate disposal of the plastic bottles. It does not provide an avenue for the payment of the refund to a non-importer who successfully achieves the above two requirements. This has serious implications for the sustainability of start-up companies interested in collecting and re-exporting plastic waste from the State of Grenada.
- Monies are not consistently submitted to the GSWMA in a timely manner by the authorised entity/ies responsible for collecting the levy.
- Tipping and haulage fee are not paid by commercial entities.

Economic instruments in operation

Two main economic instruments for waste management are in place and operational in Grenada.

1. The Environmental Levy
2. Grenada Breweries Limited (GBL) Glass Bottle Refund System: Incorporated in 1960, GBL, a member of the ANSA McAL Group of Companies produces and distributes a diversity of products packaged in glass bottles including its flagship brands Carib, Stag, Shandy Carib, Ginseng Up, Malta products and soft drinks. Its brand forms a central part of Grenada's culture and socio-economic landscape, and transcends age and social class (ANSA McAL Group of Companies, 2015).

The company introduced its bottle refund system (BRS) in the early 1970s as part of its commitment to corporate stewardship. Approximately 900,000 cases of drinks, equivalent to about 21.6 million bottles, are placed on the market annually. Bottles can be reused about five to seven times in the production system prior to being recycled. To administrate the BRS, consumers are charged XCD 9.00 on each 24-bottle case of drinks,²⁶ the cost of which is passed on to the consumer. On return of the bottles to the GBL, the consumer can do one of two things: (1) collect the actual refund in cash based on the number of accepted bottles, or (2) reinvest the refund into the purchase of additional drinks. Bottles can be returned to GBL through a variety of avenues:

- directly to GBL's warehouse located at Frequente, St. George's;
- directly to the shop or supermarket where the drinks were purchased;²⁷
- through the GBL beverage trucks that travel through the various communities on a daily basis (depending on the availability of space on the vehicles).

²⁶ XCD 6.00 for 24 bottles and XCD 3.00 for the case.

²⁷ Particularly for small shops, business owners must be convinced that the drinks were purchased at their establishment before the refund can be paid.

Box 2: Number and type of human resources involved in the BRS at the national level

Once the bottles enter the GBL warehouse, about 14 people provide direct support to sort and clean the bottles for reuse and/or further export for recycling. The main human resources involved are:

At the warehouse

- one receiver
- four sorters
- at least two truck drivers
- two fork lift operators

At the factory

- five workers

Once bottles enter GBL's warehouse, they are checked by **one receiver and one empties storekeeper** to ensure that the bottles are in an acceptable condition. Bottles approved for refund are then sorted by **four sorters**, who categorise bottles by brand/colour for further processing. The combined sorting team typically sorts an estimated 3,000–4,000 cases per day, and are paid on a piece-rate basis.²⁸ Sorted cases are stored and then subsequently transported to the GBL factory.

At the GBL factory, bottles are processed using an elaborate system of conveyor belts, heat and chemical treatment, and any substandard bottles are electronically removed. Five workers are involved directly in this aspect of the bottle reuse and differentiation process (refer to Box 2 for the human capital involved directly in BRS). All substandard bottles emanating from this process are crushed and sent back to the manufacturer in Trinidad and Tobago for recycling into new bottles, which are re-introduced in the production system. GBL benefits from access to a bottle manufacturing and recycling plant at its company's headquarters in the Republic of Trinidad and Tobago.

Officials reported an average bottle recovery rate of 90%. Major reasons purported for the high return rate are outlined below:

²⁸ Based on how many cases are completely sorted.

- High public knowledge of and familiarity with the system – while the system is well entrenched in the Grenadian system, GBL also undertakes ongoing communication campaigns to encourage the prompt return of bottles.
- The system is economically viable for GBL, since the bottles are reintegrated into the production cycle.
- The purchase of products at GBL is linked to the provision of empty bottles or payment for bottles, i.e. for every sale transaction, an empty bottle must either be provided or paid for.
- GBL has the financial resources to support the system, coupled with capacity for bottle recycling.
- Community-based re-collection systems are well instituted.

Actions undertaken to improve solid waste management

GSWMA implements a number of initiatives designed to enhance the management of the solid waste stream. Three principal programmes are described below:

1. The Environmentally Friendly School Initiative (EFSI) is a programme targeting pre-primary, primary and secondary schools where, for nine months each year, participants undertake projects that focus on different aspects of solid waste management. Projects can cover public education, litter management, waste minimisation, and the nexus between waste management and tourism. The programme is evaluated and incentives are provided for excellent performance. On average, 56 schools participate in the programme each year (refer to Box 3).
2. GSWMA, in collaboration with the Ministry of Health, delivers an annual Food Vendors Licensing Workshop, which aims to promote, among other things, best practices in waste management for the food service sector.
3. GSWMA produces a regular radio programme that is broadcast every day on seven different radio stations.
4. GSWMA supports any initiative geared to promote effective solid waste management.
5. A range of non-governmental organisations and private sector companies are involved in diverse interventions and, in particular, interventions seeking to tackle issues in plastic waste management.

Box 3: Benefits of the EFSI (GSWMA, 2015)

Students:

- develop a better appreciation of their school and its surroundings, and take leadership in keeping it clean and litter free;
- become better aware of waste reduction options, including the recycling of paper, plastic, metal, wood, green waste and food scraps;
- take ownership of public places through the adoption of rivers, historic sites, beaches and recreational areas;
- increase their knowledge of the causes and prevention of pollution.



View on the port

Other initiatives to improve the management of plastic bottles and plastic packaging waste specifically

Table 12: Summary of additional interventions to address plastic bottle and plastic packaging waste

Nature of the initiative	Lead and collaborating entities
<p>A range of luxury, midrange and boutique hotels is certified with reputable eco-labels such as Green Globe and Earth Check benchmarking and certification programmes. Inherent in these certifications is a commitment for voluntary compliance with the requirements of environmental sustainability. Key on the agenda of these hotels is staff training on eco-practices and a ban on polluting materials such as plastics. In Grenada, a number of hotels have been awarded eco-labels. These include</p> <ul style="list-style-type: none"> • Blue Horizon Garden Hotel • Calabash Hotel • True Blue Bay Resort • Spice Island Beach Resort • Mount Cinnamon Resort and Beach Club • Sandals La Source Grenada. 	<p>Certification boards and local hotels.</p>
<p>Importation and use of alternatives to plastics and/or biodegradable plastic material.</p>	<p>Selected hotels, supermarkets and product distribution companies.</p>
<p>Annual clean-up campaigns in Grenada’s coastal areas led by the Ocean Conservancy and other NGOs and private sector companies.</p>	<p>The Ocean Conservancy, NGOs and the private sector, individuals, and general public.</p>
<p>Proposal from the Grenada Hotel and Tourism Association (GHTA) and its Go Pure Action Group in collaboration with GSWMA to impose a ban on expanded polystyrene (styrofoam or EPS) articles; in particular, calling on the Government of Grenada to:</p> <ul style="list-style-type: none"> • ban the import, sale, distribution and possession of expanded polystyrene articles on the islands. The articles ban should include but not be limited to cups, plates, trays or clamshell containers of any size made out of EPS as well as ‘packaging peanuts’ used in loose-filled packaging (GHTA, 2015). <p>due to its negative implications on people’s health and the environment.</p>	<p>GHTA, Go Pure Action Group, GSWMA, and partner bodies.</p>

11.2 Annex 2: Stakeholders interviewed to gain an overview of the current situation

Name	Position	Representing
Dieter Rothenberger	Head of German-Grenadian Pilot Programme	Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH – ICCAS
Karen Roden-Layne	General Manager	GSWMA
Myrna Julien	Public Relations Officer	GSWMA
Lendon Bullen	Operations Manager	GSWMA
Afia Joseph	Marketing and Development Manager	Glenelg Spring Water
Cody Lewis	Production Manager	Baron Foods Grenada Ltd
Karim Richards	Sales and Marketing Manager	Gren Pak Distributors Ltd
Jim Jardin	Managing Director	Summer Ltd
Marie Fielden	Human Resources and Environmental Manager	True Blue Bay Resort
Paula Lambert	Warehouse Supervisor	Grenada Breweries Ltd
Jeremy Bain	Logistics and Yard Supervisor	Grenada Breweries Ltd
Mindy Joseph	~	Grenada Breweries Ltd
Silke Rothenberger	Industrial and Environmental Engineer	(freelance consultant)
Mr Nelson	Zonal Supervisor	GSWMA
Deshawn Jones	Zonal Supervisor	GSWMA
Terry Noel	Zonal Supervisor	GSWMA
Ezra Campbell	In-Country Project Coordinator (IPC) for Grenada	Eastern Caribbean Marine Managed Area Network (ECMMAN) Project
Ms Budd	Accounts and Statistics	Grenada Port Authority
Samantha Thomas	Research Officer	Grenada Tourism Authority
Cathyann Alexander-Pierre		
	Marketing and Promotion Specialist	Grenada Industrial Development Corporation
Glennis Noel		
	Administrative Officer	Distribution Division
Geo. F. Huggins & Co. (G'da) Ltd		
Cathy Francis	~	Coconut water sales
Ryan Singh	~	Spice Isle Recycling
Kenny Lalsingh	Managing Director/Owner	Kalico Ltd.
Students (names not taken)		
Sites visited		
	<ul style="list-style-type: none"> Perseverance Landfill and Dump Grenada Breweries warehouse and factory 	

11.3 Annex 3: Possible instruments and an evaluation of their suitability for Grenada

Instruments to improve waste management	Type of instrument	Description	Objective	Discussion	Focus on reducing plastic bottle waste (that ends up in sea)	Evaluation
Extended producer responsibility for plastic bottles/packaging	Economic	Producers/importers are made responsible for the entire lifecycle of their product. Strong options are: <ul style="list-style-type: none"> the establishment of a fully private entity that is jointly owned, operated and supported by the producers/importers in question; requiring producers to fully fund the collection and recycling scheme; the setting of high targets. 	To reduce the amount of plastic bottle waste or enhance the performance of collection operations by placing the responsibility for managing this waste on the producers/importers.	EPR is seen as a very flexible instrument in terms of its design and of the levels of involvement required of the relevant authorities and industry.	Direct/indirect	According to information provided by the national expert, the legal basis for EPR already exists in the Environmental Levy Act No 5 of 1997, amended (Act No. 12 of 2000 and Act 13 of 2007).
Deposit-refund system for plastic bottles	Economic	Consumers pay a deposit when buying a bottled product and are refunded the deposit when they return the bottle.	To reduce the amount of plastic litter by creating an incentive for consumers to return used bottles.	The system can be introduced by the state or importers.	Direct	Deposit-refund systems are known to be very successful instruments for reducing the amount of plastic bottle waste that ends up as litter or landfill. In Grenada a voluntary deposit-refund system for glass bottles run by a local brewery is already in place. The experiences gained from operating this system can be used to guide the development of a similar system for plastic bottles. Having to pay a deposit helps to motivate consumers to overcome their convenience cost and return their empties. Additionally this would incentivise the informal sector, which already collects glass bottles, to also collect and return littered plastic bottles. Campaigns to raise consumer awareness about the existence of the scheme, the deposit charge and the thinking behind the deposit-refund system are essential to promote the scheme.

Green: pre-selected for Grenada. Yellow: would also be suitable. Red: not selected for Grenada. Blue: accompanying measures.

Instruments to improve waste management	Type of instrument	Description	Objective	Discussion	Focus on reducing plastic bottle waste (that ends up in sea)	Evaluation
Advanced recycling fees: fee scheme for plastic bottle importers	Economic	Producers/importers are obliged to pay a small fee for waste treatment.	This approach aims to internalise the costs of disposal in the product itself, which incentivises the greater use of recyclable materials or reduces the amounts of waste produced.	There are different ways to implement this kind of scheme.	Indirect	A levy for importers already exists. However, as preform bottles are exempted from this levy, only a small proportion of plastic bottles are covered. The income derived from this levy is currently used to cover the collection costs of mixed municipal waste. The way it is currently regulated means it does not end up promoting the separate collection and recycling of plastic bottles. Therefore, the conditions should be amended so that all or part of the income is used to support the deposit-refund system, enabling it to become self-financing and to promote high rates of plastic bottle separation and collection.
Exemptions could be allowed for those importers that take back their waste.	Economic	In this approach, waste producers are charged for the waste management services they benefit from. To incentivise waste reduction, the charge should correspond to the amount of waste produced by the fee payer.	To improve waste management and reduce plastic bottle waste.	Polluters must pay for the quantities of waste they produce ('pay as you throw'). This measure will raise revenues, especially if bags are also used for other purposes. This kind of scheme does not tackle plastic bottle waste directly. A collection and billing system will need to be established.	Indirect	Most of the bottles disposed of at home end up at the open landfill located by the coast. So far, the separate collection of waste fractions hardly occurs, despite the fact that this would save on expensive landfill space. A system could be introduced in which locals and businesses/hotels are required to collect plastic bottles separately and are then rewarded for this activity. This kind of system could be highly effective, but it would need to be very well prepared (calculation of fees, design of the system, billing, collection, etc.). By attaching a financial incentive to the collection of plastic bottles (instead of setting high fees for residual waste), the fly-tipping that often results from the imposition of PAYT schemes may be prevented. The system could be extended to include glass bottles and, if it works well, then also to other recyclables.

Instruments to improve waste management	Type of instrument	Description	Objective	Discussion	Focus on reducing plastic bottle waste (that ends up in sea)	Evaluation
Installation of drinking fountains providing free potable water	Infrastructural	In high-footfall locations, drinking fountains could be installed to provide free potable water.	To reduce the amount of plastic bottle waste.	The successful implementation of this kind of scheme can drastically reduce plastic bottle waste. The scheme depends on the availability of potable water on the islands and on tourists trusting the water supply from a public fountain. There may be resistance from the packaged water industry. The scheme requires a large initial outlay and is costly to maintain.	Direct	It is understood that tourists distrust the islands' tap water supply, so to make this instrument work, an intensive awareness-raising campaign would be required, along with tight controls on the water quality and functional capability of drinking fountains. The packaged water and plastic bottle industries are likely to oppose this measure. This option may be particularly suitable for tourist areas where the risk of bottle littering is highest, such as around the large pier in St George's.
Introduce incentives, subsidies, funds and exemptions for recycling facilities	Economic	Successful initiatives and general recycling efforts are rewarded with small amounts of funding or exemptions from certain duties.	To improve recycling and thus reduce the amount of plastic bottle waste.	This scheme is costly and generates no revenues. However, once the recycling industry takes off, less waste collection and disposal is needed. This scheme is also relevant for all other types of recyclables.	Indirect	According to information provided by the national expert, plastic waste is hardly ever recycled in Grenada. There is interest in developing a recycling company to collect and export plastic bottles. However, current market prices for plastic bottles are so low that the enterprise would not be viable without subsidies or payment for the collection of the plastic bottles.

Instruments to improve waste management	Type of instrument	Description	Objective	Discussion	Focus on reducing plastic bottle waste (that ends up in sea)	Evaluation
Voluntary agreement with the hotel sector to introduce separate waste collection	Economic	By adopting separate waste collection, hotels can improve their image and also, possibly, receive some form of accreditation or label.	To increase separate collection and, in so doing, reduce the number of plastic bottles going to landfill.	A strong incentive is needed if hotels are to participate. Staff will need to be trained and tourists targeted with awareness-raising campaigns.	Indirect	Most of the islands' hotels have still not introduced waste separation. There are occasional initiatives that could be extended to include other hotels or that could be integrated into general measures.
Voluntary commitment by the tourism sector to keep beaches clean	Voluntary	The tourism sector could put in place clean-up operations by, for example, paying students to clean beaches every evening/week, etc.		Experience shows that the gains made from increased tourist numbers is higher than the costs of clean-up operations. However, this system does not reduce the amount of litter produced and disposed of. Neither does it significantly change the behaviour of local people and tourists. It would, however, directly reduce the amount of general litter and thus plastic bottle litter that ends up in the sea.	Direct	This measure is only useful in cases where waste left on beaches is not collected up by other initiatives. Clean-up operations already exist in Grenada but, as littering is very common, further cleaning would help to reduce the amount of plastic bottle waste that ends up in the sea.

Instruments to improve waste management	Type of instrument	Description	Objective	Discussion	Focus on reducing plastic bottle waste (that ends up in sea)	Evaluation
Tourist waste tax (that could, for example, be included in hotel costs, car parking fees, ferry fees)	Economic	Tourists are required to pay a charge for visiting the island. The income derived is then directed towards action to improve waste management.	To improve waste management and, in so doing, reduce plastic bottle waste and littering.	This is a good measure if tourists are the main source of litter. However, it does not raise people's awareness significantly or specifically target plastic bottles, and it is difficult to implement as many tourists are daytime-only visitors, so the charge cannot be added on to room rates. Adding the charge to ferry ticket prices is a strong idea, especially as locals are exempted, but, again, controls are necessary.	Indirect	Tourists are already charged an environmental levy, which is transferred to the Grenada Solid Waste Management Authority to support its operations.
Product ban on disposable plastic bottles	Legal	Plastic bottles are banned outright by the local authority.	To reduce the amount of plastic bottle waste through prohibition.	Not or hardly feasible, given the inevitable resistance of industry. Bottles could be bought on the mainland or products sold in other containers that do not effect any change in waste behaviour.	Direct	This instrument is not deemed to be feasible for implementation in Grenada. High levels of resistance can be expected from the plastic bottle industry and producers and consumers might simply shift to other products that come with similar or new problems.
Fines for littering	Economic	Specific fines are introduced for littering, which should be high enough to deter people from engaging in the activity. Such a scheme only works if controls are properly carried out.	To reduce the amount of plastic bottle litter that people generate.	Fines cannot be introduced specifically for plastic bottles but for waste in general. Such a scheme only works if controls are carried out.	Direct	A system of littering fines is already provided for in existing legislation, but it is not enforced in practice. As such, it has no impact on the prevention of littering. New legislation with more realistic fines has been drafted and will be enforced in the near future.

Instruments to improve waste management	Type of instrument	Description	Objective	Discussion	Focus on reducing plastic bottle waste (that ends up in sea)	Evaluation
Increase the number and density of closed public waste bins and waste collection points (for plastic waste/plastic bottle waste)	Infrastructural	More closed public waste bins and waste collection points are installed by companies or government, especially in areas highly frequented by tourists.	To raise awareness about and reduce the littering of used plastic bottles.	This is not a policy instrument per se, but is more of an infrastructural measure. It is a valid approach for raising awareness but is not viable as a standalone measure. Initial installation and ongoing maintenance would prove costly, so the approach must be introduced in combination with other revenue-raising instruments and also awareness-raising initiatives to modify the behaviours of locals and tourists.	Direct/indirect	No street cleaning services are in place for St George's commercial centre, one of the most high-footfall areas in Grenada. More waste bins would definitely help to decrease the amount of waste, especially plastic bottles, that end up as litter.
Awareness-raising campaign	Informative	Different campaigns and training are delivered to increase local people's and tourists' awareness of the issue and its effects on the environment.	To reduce the amount of plastic bottle litter that people generate.	While this is not a policy instrument and would be costly at the outset, this scheme would back up other policy instruments and help to ensure they achieve more successful outcomes.	Direct	Almost all stakeholders assert that raising the awareness of locals and tourists is essential. Campaign should focus mainly on the correct disposal of waste and on separate waste collection.

11.4 Annex 4: Kiribati's container deposit legislation



REPUBLIC OF KIRIBATI
(No. 9 of 2004)

I assent,
Aruda Teng
Beretitenti
3/2/2004

AN ACT TO LEVY DEPOSITS IN RESPECT OF THE RECOVERY OF WASTE MATERIALS IN KIRIBATI; AND FOR CONNECTED PURPOSES

Commencement:
2004

MADE by the Maneaba ni Maungatabu and assented to by the Beretitenti.

**PART I
PRELIMINARY**

Short title

1. This Act may be cited as the Special Fund (Waste Material Recovery) Act 2004.

Interpretation

2. In this Act unless the context otherwise requires –

“deposit” means a deposit leviable under this Act;

“the Special Fund” means the Special Fund established pursuant to section 7.

**PART II
DEPOSITS**

Power to levy Deposits for waste material recovery

3. (1) The Minister responsible for environment acting in accordance with the advice of the Cabinet may, subject to the provisions of this Act, levy Deposits in respect of prescribed materials for waste material recovery.

(2) Deposits levied under subsection (1) of this section shall be laid before the Maneaba ni Maungatabu within forty-eight hours of the day on which the next meeting of the Maneaba commences and shall come into operation on publication unless the Maneaba by resolution amends it or rejects it as the case may be.

Orders relating to Deposits

4. (1) The Minister responsible for environment acting in accordance with the advice of the Cabinet may by order make provision as to the classes of materials for recovery in respect of which the Deposits are to be levied and as to the scales and other provisions in accordance with which they are to be levied.

(2) An order made under subsection (1) of this section shall be laid before the Maneaba ni Maungatabu within forty-eight hours of the day on which the next meeting of the Maneaba commences and shall come into operation on publication unless the Maneaba by resolution amends it or rejects it as the case may be.

(3) Any such scales or other provisions may provide for Deposits to be levied at different rates by reference to such circumstances or combination of circumstances (whether relating to classes of materials, seasons of the year, days of the week, times of day or otherwise) as the Minister may consider appropriate.

(4) An order under this section may provide that materials of any description specified in that behalf in the order (notwithstanding that they are materials of a class specified in the order pursuant to subsection (1) of this section) shall be exempted from the payment of Deposits.

Regulations for waste material recovery scheme

5. (1) Provision may be made by regulations made by the Minister responsible for environment acting in accordance with the advice of the Cabinet, under this section –

- (a) for the designation of one or more places at which Deposits are to be paid;
- (b) as to the persons by whom such Deposits are to be paid and the manner in which they are to be paid;
- (c) for ensuring that materials in respect of which Deposits are leviable do not enter Kiribati without payment of the Deposit;
- (d) for regulating the recovery of materials, including expenditure on recovery of materials;
- (e) for general administration of waste material recovery in Kiribati.

(2) Regulations made in pursuance of paragraph (c) of subsection (1) may include provisions for prohibiting or otherwise preventing any such material from entering Kiribati or further entering Kiribati until any Deposit leviable in respect of the material has been paid.

(3) Any regulations made under this section may provide for a notice, specifying the classes of materials in respect of which Deposits are leviable, to be displayed at each place designated in accordance with subsection (1)(a) of this section.

PART III FINANCIAL PROVISIONS

Establishment of Special Fund

6. A Special Fund to be known as Waste Material Recovery Fund shall be established in accordance with section 107(2) of the Constitution and section 13 of the Public Finance (Control and Audit) Ordinance.

Payments into the Special Fund

7. There shall be paid into the Special Fund –

- (a) any money appropriated by the Maneaba ni Maungatabu for the purposes of the Fund; and
- (b) any monies collected as Deposits under this Act or orders or regulations made thereunder; and
- (c) any other money lawfully available to the Fund.

Payments out of the Special Fund

8. (1) There shall be paid out of the Special Fund –

- (a) the amount of any expenditure by the Republic on the costs of recovering waste materials; and
- (b) the expenses, as approved by the Minister responsible for finance with the concurrence of the Minister responsible for environment, of the administration and carrying into effect of the provisions of this Act.

(2) No money shall be paid out of the Special Fund except in accordance with a Warrant under the hand of the Minister responsible for finance authorising the Chief Accountant to issue the money to the accounting officer responsible for operating the Fund.

Control of the Special Fund

9. In the performance of his functions under this Part of this Act and under section 13 of the Public Finance (Control and Audit) Ordinance in relation to the Special Fund the Minister shall use his best endeavours to manage the Special Fund in such a way that, taking one year with another, the income of the Special Fund is not less than sufficient to meet its outgoings including depreciation charges.

Annual reports

10. (1) The Minister responsible for finance shall, before the end of each financial year, submit to the Maneaba ni Maungatabu –

- (a) a statement showing the estimated income and expenditure of the Special Fund for the current financial year; and
- (b) estimates of the income and expenditure of the Special Fund for the next financial year.

(2) The Minister responsible for finance shall, within six months after the end of each financial year, lay before the Maneaba ni Maungatabu a report dealing generally with the operations of the Special Fund during the preceding financial year and containing the audited statement of accounts for that financial year.

PART IV SUPPLEMENTARY PROVISIONS

Offences

11. Any person who –

- (a) wilfully refuses, or without reasonable excuse neglects or fails to pay a Deposit which he is required to pay under this Act or order or regulations made thereunder or wilfully avoids payment of any such Deposit; or
- (b) wilfully, with intent to defraud, claims or takes the benefit of any exemption from the Deposit (whether the exemption in question subsists by virtue of section 4(4) of this Act or otherwise) without being entitled to that benefit; or
- (c) in circumstances not falling within either of the preceding paragraphs, contravenes provisions of this Act or any orders or regulations made under this Act,

shall be guilty of an offence and liable on summary conviction to a fine not exceeding \$1,000 and in default of payment of such fine, to imprisonment for a term not exceeding 2 months.

Civil proceedings

12. Without prejudice to any proceedings under section 11, any Deposit which remains unpaid after it has become due for payment shall be summarily recoverable by the Republic from the person liable to pay the Deposit as a civil debt.

SPECIAL FUND (WASTE MATERIAL RECOVERY) ACT 2004

EXPLANATORY MEMORANDUM

This Act seeks to empower the Minister responsible for environment, acting in accordance with the advice of the Cabinet, by order to levy deposits for the recovery of waste materials from the importers of waste materials.

An order made by the Minister responsible for environment in respect of the levying of deposits shall be laid before the Maneaba ni Maungatabu within forty-eight hours of the day on which the next meeting of the Maneaba commences and shall come into operation on publication unless the Maneaba by resolution amends it or rejects it as the case may be.

Section 4 of the Act empowers the Minister responsible for environment to classify materials in respect of which deposits are to be levied and prescribe the scales and the criteria in accordance with which deposit are to be levied.

An order made by the Minister responsible for environment under Section 4 of the Act shall be laid before the Maneaba ni Maungatabu within forty-eight hours of the day on which the next meeting of the Maneaba commences and shall come into operation on publication unless the Maneaba by resolution amends it or rejects it as the case may be.

Sections 6, 7 and 8 establish a Special Fund (outside the Consolidated Fund) into which shall be paid, among others, all deposits collected in respect of the materials. All monies by the Republic to meet or defray costs of recovering the materials shall also be paid out of the said Special Fund.

Section 11 makes it an offence wilfully to refuse or neglect to pay a deposit which is required to be paid under this Act.

Titabu Tabane
Attorney General
4 May 2004

LEGAL REPORT

I hereby certify that in my opinion none of the provisions of the above Act conflict with the Constitution and that the Beretitenti may properly assent to the Act.

Titabu Tabane
The Attorney General

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