



*Caribbean Waste Management Regional
Action Plan*

NOTE FROM THE SECRETARIAT / REGARDING THE CURRENT DOCUMENT

This document was developed by the UN Environment Programme (UNEP) with the funding from the Government of the Kingdom of the Netherlands as a response to the recommendations and extensive stakeholder dialogue at the various waste related conferences and workshops (summarized in the document below) over the past few years in the Caribbean region. The first version of the current document was prepared for and presented at the 1st High-Level Forum of the Caribbean Ministers Responsible for Waste Management in Georgetown, Guyana in October 2017. Since that time the Document has been fully revised to include the comments and recommendations received during the above-mentioned Forum. The current version in hand is hence a more comprehensive and consolidated effort. The main purpose of the document is to serve as an important reference when identifying priority actions for the region as well as designing and implementing them.

The current document was circulated to the meeting participants and other key stakeholders in September 2018 in advance of the 2nd High-Level Forum of Caribbean Ministers Responsible for Waste Management, held in Montego Bay, Jamaica in October 2018. Feedback was used to finalize the document and move to the implementation of the agreed priority actions for the region.

The original document was prepared and revised by:

Karen Luken
Consultant, UNEP

It was finalized following the 2nd High-Level Forum of Caribbean Ministers responsible for Waste Management, October 2018

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Appendix A: Examples of Regional Best Practices

- Caribbean Waste Collective- Aruba, Bonaire & Curacao
- Antigua & Barbuda – Plastic bag ban
- Barbados – Bottle bill
- Belize – Landfill tipping fees
- Aruba – Automated collection
- Grenada – Composting
- Aruba – Litter law enforcement

1 INTRODUCTION

The implementation of sustainable waste management (SWM) systems in island nations is critical as waste management has a direct impact on the state of the environment, well-being of humans and ultimately the economy. When waste is dumped in ravines and waterways, mosquito-borne illnesses such as dengue fever can spread; and the common practice of uncontrolled burning accounts for half of the dioxin and furan emissions on island nations¹.

In addition, waste pollution can destroy local economies when commercial agriculture and fishing are no longer viable due to contaminated soils and waters, and tourists no longer find the environment attractive. Waste pollution, which accumulates along the beaches and waterways, disrupts the natural aesthetic beauty of the beaches, which diminishes the recreational value and tourism quality of these resources. Sustaining the tourism sector will require not only trash removal, but also improving solid waste disposal practices on land, and investment in sustaining coastal and reef ecosystems².

The people who are most vulnerable to these conditions reside in lower-income communities, as landfills and dumped waste are typically located on land that is least valuable and desirable. These residents, while producing little waste themselves, endure the most from poor waste management consequences.

Despite the undeniable importance, many Caribbean island nations have yet to develop sufficiently funded and comprehensively regulated infrastructures to collect, process, recover and dispose solid waste due to:

- Limited availability of suitable land on small islands and atolls for landfills – exacerbated by customary land tenures and Not in My Back Yard (NIMBY) attitudes;
- Remoteness of many islands, resulting in high costs for consumables used in typical waste management operations that must be imported and increasing the costs of transport of secondary materials and waste from the islands;
- Small and sometimes sparse populations that limit any potential economies of scale;
- Limited institutional and human resources capacity; and

¹ *Regional Evaluation on Urban Solid Waste Management in Latin America and Caribbean*, Pan American Health Organization, 2010

² *Regional Action Plan on Marine Litter Management (RAPMaLi) for the Wider Caribbean Region*, UN Environment Programme, 2014

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- Lack of financing for solid waste management systems has not kept pace with growth in waste quantities.³

While national and local governments are often best positioned to make certain waste management decisions, such as awarding service contracts, there is significant value in strengthening cooperation and enabling strong partnerships at the sub-regional and regional level to address the unique and complex solid waste management issues in the Caribbean. Consequently, a *Regional, Caribbean Solid Waste Management Action Plan* (SWM Action Plan) has been prepared to help catalyze the development of sustainable integrated waste management systems throughout the region as well as on every Caribbean island.

2 GOALS AND OBJECTIVES

The ultimate goal of the SWM Action Plan is to define both regional and island-specific waste management strategies and systems that are environmentally and financially sustainable; and most importantly, supported by civil society. The SWM Action Plan will also promote the development of programmes and projects that preserve capacity at existing landfills; and optimize the use of waste as a resource. The specific objectives of the SWM Action Plan are to identify regional strategies and initiatives to facilitate:

- Communication and Collaboration
- Strategic Planning
- Funding SWM Systems
- Expanding the SWM Infrastructure
- Managing Disaster Debris
- Preventing Waste Pollution
- Increasing Landfill Diversion
- Fostering Public-Private-Partnerships (PPPs)

Many of these strategies and initiatives reflect the best practices that multiple islands in the region have implemented. Some examples are summarized in Appendix A.

3 HISTORICAL PERSPECTIVE

The SWM Action Plan includes perspectives of and recommendations from government representatives, community leaders, residents, recyclers, waste management companies, energy companies, consultants, NGOs, academia, and international organizations. The SWM Action Plan also reflects extensive dialogue with these critical stakeholders at conferences and workshops over the last several years, which provided a forum to:

- Ascertain their perspective on the strengths and weaknesses of existing waste management systems;
- Identify best practices for managing waste within the region; and,

³www.sprep.org/attachments/Pacific_RSWMS_2010-2015.pdf.

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- Formulate the goals and objectives of a SWM Action Plan.

In addition, the process to develop a SWM Action Plan assessed both international and regional conventions, policies and protocols that govern waste in the Caribbean.

CONFERENCES/WORKSHOPS

Regional partners have conducted conferences and workshops on waste management for over a decade. These engagements served as the foundation to structuring a pathway to improve waste management that could realistically be implemented in the region. Recent conferences and workshops are summarized below.

Jamaica 2014

In 2014, the Planning Institute of Jamaica and the National Solid Waste Management Authority, with support from the Inter- American Development Bank (IADB), organized a conference that allowed nine Caribbean countries to share their experiences on SWM and the SWM issues faced by the Caribbean region.

This conference focused on:

- Examining approaches to SWM relevant to the changing dynamics of economic, social and environmental issues in the region.
- Providing guidance to stakeholders on the best practices in SWM suited for developing countries in the Caribbean, including management of special waste streams such as hazardous waste, medical waste, and e-waste.
- Establishing networks to facilitate dialogue among countries in the region and for sharing information and experiences.
- Examining the business potential of the sector, including waste-to-energy (WTE), recycling and other waste treatment options.

Curaçao 2016

In September 2016, a workshop entitled “From Waste to Resource: Policy and Business Dialogue” was conducted in Willemstad, Curaçao and focused on the islands of Curaçao, Aruba, Bonaire, Saint Eustatius, Saba and Saint Maarten. The UN Environment Programme and Government of Curaçao organized the workshop, with the support of the Dutch Ministry of Infrastructure and the Environment. In addition to government representatives, participants included recyclers, waste management companies, energy companies, consultants, NGOs, academia, and international organizations. The workshop identified options for concrete steps in policy design and implementation to prevent and reduce waste flows and landfilling, as well as technical solutions to increase resource recovery and recycling amongst these specific islands.

Trinidad & Tobago 2016

The Caribbean Water and Wastewater Association (CWWA), in collaboration with the IADB and the Caribbean Development Bank (CDB) jointly-hosted a workshop on the status of SWM in the Caribbean in October 2016. Participation ranged from Caribbean country entities responsible for SWM, practitioners, institutions, ministry representatives, international and

regional development partners and other participants who contributed their expertise, experiences and ideas. Participants identified the need for the following actions:

- Training for SWM personnel as well as a Master of Science programme for SWM;
- Increased political will, high-level advocacy, public awareness and education;
- Formation of SWM Authorities on every island to centralize jurisdictional and other issues related to SWM;
- Regional cooperation in the approach to SWM given commonality in the issues faced;
- Possibly convening parallel High-Level Forum (HLF) of Ministers for SWM within the CWWA;
- Evaluation of the status of SWM in the Caribbean as a whole;
- Raising awareness of SWM in the region by also highlighting its linkages to and with:
 - The marine sector
 - Tourism
 - Health
 - Climate Change
 - Sustainable Development Goals
 - Water and wastewater
- The urgent need to foster better understanding of and guidelines on the viability of Waste-to-Energy (WtE) in the midst of regional clamor for WtE as an alternative to final disposal and waste as a renewable energy source.

Jamaica 2017

In July 2017, UN Environment and the Dutch Ministry of Infrastructure and the Environment conducted a Caribbean Waste Management Conference “*SIDS Approaches to Waste Management and the Circular Economy*” (CWM Conference). A primary objective of the CWM Conference was to inventory the existing solid waste management systems throughout the Caribbean to assess strengths and weaknesses and begin establishing a platform for a regional solid waste action plan that fosters an environmentally and financially sustainable solid waste management system.

Guyana 2017

One of the key issues that emerged at the CWM Conference was that there was a need to bring the urgency of addressing solid waste management issues to the highest levels of discourse among Ministers responsible for Waste Management in CARICOM. This approach would help facilitate the establishment of regional solutions to complex, waste management issues.

Therefore, the Caribbean Water & Wastewater Association, UN Environment, the Pan American Health Organization and the Inter-American Development Bank organized a Ministerial Forum in October 2017, comprising the development partners, Caribbean Ministers responsible for waste management and technical experts in order to discuss a regional strategic plan for waste management.

CONVENTIONS, PROTOCOLS AND ACTION PLANS

Conventions and protocols that influence the management of waste were assessed throughout the planning process to facilitate harmonization between these existing initiatives and the SWM Action Plan. The most relevant initiatives that may influence the SWM Action Plan are summarized below.

The London Convention

The Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter 1972, the "London Convention" for short, is one of the first global conventions to protect the marine environment from human activities and has been in force since 1975. Its objective is to promote the effective control of all sources of marine pollution and to take all practicable steps to prevent pollution of the sea by dumping of wastes and other matter. Currently, 87 States are Parties to this Convention.

The Global Programme of Action for Protection of the Marine Environment (GPA)

UN Environment Programme catalyzed efforts to develop the GPA, which was adopted in 1995. This is the only global intergovernmental mechanism to guide the protection of the marine environment from land-based sources of pollution. In its efforts to curb marine debris, the GPA initiated the development of the Global Partnership on Marine Litter (GPML) in addition to its partnerships for nutrients (GPNM) and wastewater (GW2I).

Protocol Concerning Pollution from Land-Based Sources and Activities (LBS Protocol) of the Cartagena Convention

The Convention for the Protection and Development of the Marine Environment in the Wider Caribbean Region (WCR), usually known as the Cartagena Convention is a regional legal agreement for the protection of the Caribbean Sea. The Convention was supported by three technical agreements or Protocols on Oil Spills, Specially Protected Areas and Wildlife (SPAW) and Land Based Sources of Marine Pollution (LBS). The LBS Protocol includes regional effluent limitations for domestic wastewater and requires the development of plans to address agricultural non-point sources of pollution.

Basel Convention

The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their disposal, usually known as the Basel Convention, is an international treaty that was designed to reduce the movements of hazardous waste between nations, and specifically to prevent transfer of hazardous waste from developed to less developed countries (LDCs). The Basel Convention is also intended to minimize the amount and toxicity of wastes generated, to ensure their environmentally sound management as closely as possible to the source of generation, and to assist LDCs in environmentally sound management of the hazardous and other wastes they generate.

MARPOL Annex 5

MARPOL was developed by the International Maritime Organization (IMO) as an effort to minimize pollution of the oceans and seas, including dumping, oil and air pollution. Annex V of the MARPOL Convention establishes the criteria for how ship operators and coastal states manage ship garbage. Specifically, ships are required to retain on board wastes that

MARPOL prohibits ships from discharging wastes at sea. Coastal states may implement discharge requirements more stringent than outside special areas. MARPOL requires coastal states to provide of adequate reception facilities at ports for ship wastes. These wastes include:

- Garbage
- Oily waste
- Ash fouling
- Gray water
- Ballast water
- Sewage

SAMOA Pathway 2014

The Small Island Developing States (SIDS) Accelerated Modalities of Action (SAMOA Pathway) was the outcome document of the Third International Conference on SIDS. This conference affirmed the previous agreements pertaining to SIDS as well as further implementation of actions to promote sustainable development of SIDS ocean-based economies for fisheries and aquaculture, coastal tourism, seabed resources, and renewable energy. It further outlined the need for a reduction in marine pollution that threatens ocean-based economies. As a follow-up to this conference, the SIDS Action Platform was created, providing an internet platform for continued partnership development.

Regional Action Plan on Marine Litter Management (RAPMaLi) For the Wider Caribbean Region

RAPMaLi, which was originally introduced in 2008 and updated in 2016 provides background information on the institutional, legal and policy arrangements for the management of marine litter and recommendations on specific actions needed to address this pollution challenge. RAPMaLi is designed to serve as a comprehensive toolkit to assist SIDS in incorporating components of proper waste management across all sectors. These sectors include but are not limited to governmental legislation, enforcement, monitoring and research, community engagement, and the business sector.

4 KEY ISSUES AND POTENTIAL ACTION ITEMS

The following sections describe the key issues and suggest potential action items for implementation under the categories identified above: Communication and Collaboration, Strategic Planning, Financial, Infrastructure, Waste Pollution, Natural Disaster Debris, Landfill Diversion and Recycling and Public-Private Partnership / Innovation.

COMMUNICATION AND COLLABORATION

Issues

Communicating the importance of waste management and the cost of inaction to high-level officials is fundamental in advancing sustainable solid waste management systems in Caribbean island nations. Examples do exist where high-level government officials understand the relationship between sustainable solid waste management and a vibrant

economy. However, it is still the exception and not the rule in the region. Especially, if additional funding is required to improve waste management systems.

In addition, solid waste administrators, managers, regulators, operators, and educators (Solid Waste Professionals) need to have access to information and resources, as well as communicate with each other, to efficiently and effectively develop, finance, operate and maintain solid waste infrastructures and strategies. It is also needed in order to provide a greater understanding of what works, what does not and how the region can improve upon these in countries that may be uniquely challenged.

Multiple organizations, universities and financial institutions provide some level of technical and financial support to Caribbean islands. This support has produced numerous reports and studies, and a measurable amount of grants and loans have been awarded. However, no database exists that catalogues all this information and assesses the effects of the research and funding on improving waste management in the region. In addition, a platform for networking does not exist in the region.

Finally, both international and regional institutions that are associated with waste management have the potential to serve as partners in solving the region's solid waste management challenges, including:

- Basel Convention Regional Centre for Training and Technology (BCRC)
- Caribbean Development Bank (CDB)
- The Caribbean Community (CARICOM)
- Caribbean Public Health Agency (CARPHA)
- Caribbean Water and Wastewater Association (CWWA)
- GIZ
- Inter-American Development Bank (IDB)
- International Solid Waste Association (ISWA)
- Japan International Cooperation Agency (JICA)
- Pan American Health Organization (PAHO)
- Solid Waste Association of North America (SWANA)
- United Nations Environment Programme (UNEP)
- World Bank

However, communication and collaboration amongst the potential partners is not well organized or coordinated, and their role in assisting with solving waste management issues is not always clearly defined. In addition, several of these partners conduct studies on waste management, but most Solid Waste Professionals are not aware of them and some reports study the same issue.

Action Items

- Convene an intergovernmental High-Level Minister's forum on an annual basis to address regional waste management challenges and leverage island-specific strengths, accomplishments and resources. This forum would provide an opportunity

for HLF Ministers to understand the financial, operational and environmental considerations associated with operating sustainable solid waste systems and the role waste management plays in the health of Caribbean residents and economy on both a regional and national basis. The forum could also be used to educate HLF Ministers on new waste management technologies that are technically and financially viable based on Caribbean waste streams and economics.

- Establish a network for Solid Waste Professionals whereby these individuals can communicate remotely through e-mail and webinars, as well as in person. The network would also foster mentoring amongst Solid Waste Professionals. This network could be facilitated through the CWWA or SWANA Caribbean Chapter, which would allow Caribbean waste professionals to become remotely certified in service areas such as landfill management, collection efficiency and waste recovery; as well as attend international conferences and trade shows. Participation in SWANA would also allow Caribbean solid waste professionals, such, as engineers, earn continuing education units.
- Create a Knowledge Platform that contains best practices, templates for policies and regulations, due diligence studies on innovative waste management technologies, and educations/outreach materials. The Knowledge Platform would also contain data and models that would help local solid waste officials estimate the cost of deploying international waste management technologies based on regional economics, as well as criteria to vet the viability of these technologies in the Caribbean.
- Inventory all potential waste management partners to understand their role and resources in solving the region's waste management problems, as well as studies conducted, and projects funded. Once a baseline of roles and responsibilities are confirmed, a system to catalogue future activities, studies and projects will be established, as well as the criteria partners used for funding them.
- Design a regional communication campaign where all islands use the same messaging for common issues such as littering. The first step in developing a regional communication strategy would be determining target audiences and design messages that resonate with them (i.e. teenage boys and homemakers have different motivators). To make waste management "relevant" the campaign could promote all of the efforts that Caribbean islands are making through high visibility figures, such as local musicians and fully utilize social media. The campaign could also strategically partner with corporate organizations and private communication sectors (e.g. FLOW and DIGICEL) and different organizations, e.g. CWWA. The campaign would also need to leverage crises, such as landfill fires, to highlight the need for proactive solid waste management.

STRATEGIC PLANNING

Issues

While proper waste management is a regional concern, the use of a systematic process that provides clear guidance, steps and helpful tools for the development and execution of a national waste strategy is limited. This lack of a strategic planning process often results in Caribbean island nations selecting a “waste solution” without considering the systematic financial, regulatory, infrastructure or educational requirements to implement it.

As waste management affects all civil society, structuring a strategic planning process that includes their perspective is essential. Without input from residents, business and government officials on a new waste management system, siting facilities will be opposed, regulations will be challenged, funding requests will be rejected, and education campaigns will be ignored. Consequently, there is an urgent need for holistic solid waste planning (financial, economic, environmental, social, infrastructure and policy) and the adoption of integrated approaches toward waste management in the region.

In addition, island nations receive numerous, unsolicited proposals to “solve” complex waste management problems, such as WTE or other landfill diversion technologies, that claim to eliminate the need for landfills and can be deployed at no cost to local government. Unfortunately, there are no commercially operating technologies that can divert all municipal solid wastes that Caribbean island nations need to manage, from landfill disposal. Knowledgeable and committed Solid Waste Professionals operate Caribbean solid waste management systems. However, many of the companies distributing unsolicited proposals for advanced technologies communicate directly to ministries of investment or economic development, and local, Solid Waste Professionals do not have an opportunity to vet them before legal documents are executed.

The business models of these technologies typically do not include the cost to deliver waste to the WTE or recycling plant or the disposal of waste that the plant does not convert into energy or new products. Project developers typically expect the local government to bear these, systematic infrastructure and financial responsibilities. However, the government has not planned to provide this level of support and ultimately the project does not progress. In addition, many island nations do not have regulations to monitor air and water pollutants that advanced waste management technologies may generate.

Therefore, a long-term strategic plan that includes specifics on how all waste will be collected, recycled, composted, processed and/or disposed of is essential. In addition, the strategic plan should include criteria on selecting and siting solid waste facilities, as well as regulations to govern their development and operation. The strategic plan should also include estimates on the cost of providing an integrated waste management system and how this system will be funded. Finally, islands should adopt a process for ratifying strategic plans that includes the public and government officials, as well as regulations to assure that recommendations in the strategic plan are implemented.

Action Items

- Create a solid waste planning tool box that incorporates international procedures, such as the *UN Environment Programme Guidelines for National Waste Management Strategies*, but reflects regional goals, objectives and resources. The tool box could also include models for estimating the life of landfills by increasing waste recovery, as well as financial estimates and sample contracts for collecting, processing and disposing of waste. Finally, the tool box could include waste management plans completed by SIDS.
- Islands, such as Saint Lucia, that have recently completed an SWM planning process can share their experience, e.g. through a webinar.
- Establish a regional policy that incentivizes island nations to prepare SWM plans.
- Promote national strategic planning and implementation, by (i) convening a stakeholder based planning and implementation committee; (ii) identifying strategic plan monitoring mechanisms and key performance indicators; (iii) promulgating regulations to support strategic plan recommendations.

FINANCIAL

Issues

Financing from all sources - domestic, international, public and private, is critically important to advance sustainable SWM in Caribbean island nations. However, regional Solid Waste Professionals are unified in their assessment that sufficient funds are not available to operate and maintain solid waste collection, processing and disposal facilities. This inadequate funding is systematically impeding the collection, processing and disposal of waste mostly because equipment now requires major repairs or replacement since operators lacked funds to repair or conduct routine maintenance on existing equipment.

Action Items

- Evaluate the financial and economic realities of current approaches to regional waste management and assess the value of additional funding on improved efficiency, cost recovery and eventual sustainability. This evaluation could be accomplished by conducting a cost of service study on several islands with varying types of integrated waste management systems, as well as different economic and demographic considerations. Individual islands could then extrapolate the results of these studies to estimate their actual solid waste costs. In addition, a financial modelling tool for local waste authorities could be developed that estimates the return on investment from replacing equipment that requires excessive maintenance, with newer alternatives that are energy efficient and high performing.
- Create a database of the capital costs associated with various solid waste equipment, such as collection vehicles, and facilities, such as landfills.
- Benchmark how regional and global SIDS fund their solid waste management systems and establish a minimum dollar per capita ratio that regional islands should consider when developing annual budgets. This benchmarking analysis will also identify case

studies where investing in a waste management system has significantly improved cost-effectiveness of operations or when inaction has adversely affected programme performance, local economy or the environment.

- Explore a regional memorandum of understanding whereby all island nations in the region will commit to allocating revenue from SWM levies to fund SWM programmes.
- Identify mechanisms to increase the cost-effectiveness of operating and developing solid waste management systems such as constructing solid waste transfer stations or purchasing newer collection vehicles to increase solid waste collection efficiency
- Work with each island nation to adopt a “polluter pays policy” whereby generators pay either directly or indirectly for the management of SWM, including through specific activities such as participating in waste collection fees, recycling costs and landfill costs directly or through taxation
- Assemble the criteria for receiving loans and grants from multi-lateral development banks and aid agencies, as well as attracting private investors.

INFRASTRUCTURE

Issues

In Caribbean island nations, both upstream waste collection and downstream waste disposal experience significant infrastructure challenges. Upstream waste collection systems typically require an excess of 50% of a waste authority’s budget and the revenues they receive do not sufficiently fund waste collection expenditures. Lack of funds has prevented adequate maintenance and timely replacement of waste collection vehicles. Most equipment is at least 15 years old, and mechanical failures prevent efficient waste collection routing. Downstream, many of the landfills are reaching or have even exceeded maximum capacity.

The population with access to a system of regular waste collection and properly managed landfills increased from approximately 20% in 2000 to over 50% by 2010⁴. However, the trajectory of improving waste management in island nations has stalled and in fact, is regressing due to lack of national strategic planning, funding and the implementation of programmes and projects to decrease dependency on landfills.

Finally, MARPOL Annex 5 requires island nations that are parties to this convention to manage multiple types of ship-generated waste. However, many do not have adequate infrastructure to safely process and dispose of these materials.

⁴ibid

Action Items

- Conduct a joint forum comprised of Solid Waste Professionals, as well as environmental and economic development ministries, to provide guidance on making SWM infrastructure projects “bankable”.
- Determine the remaining capacity of SWM disposal facilities as part of an island nation’s strategic planning process. Each island will begin siting and financing a new disposal facility when existing facilities have less than five years of capacity.
- Create regional, guiding principles for contracting of or operating SWM collection systems, as well as designing, constructing, operating, maintaining and monitoring SWM processing and disposal facilities.
- Based on the cost of service studies discussed in Financial Actions, determine the cost per capita or cost per ton to cost-effectively and efficiently collect and manage waste on each island. Present this information to HLF Ministerial forums. Execute a regional MOU to have each island commit to provide this level of funding.
- To help island nations determine if a technology can be developed in an environmentally sustainable manner, criteria for vetting waste management technologies will be developed and distributed to ministries responsible for investment and economic development.
- All Caribbean island nations that are signatories of MARPOL, Annex 5 will establish user fees to recover all costs associated with providing facilities to manage ship-generated waste. On a regional basis, relevant partners such as IMO and the UN Environment Programme will work to identify models where a limited number of islands create infrastructure to handle the Annex 5 ship waste. Due to the potentially hazardous nature of materials delivered to these facilities, regional regulations will be adopted to assure that these facilities are designed, operated and regulated in a uniform manner. In addition, local officials will receive extensive training on inspecting waste, monitoring the facilities and water sampling. Finally, all facilities that accept Annex 5 waste will have the same tipping fee that has been determined by a detailed financially forecast analysis that determines the revenue required to design, construct, maintain, monitor and close these landfills.

WASTE POLLUTION

Issues

The introduction of waste pollution in the coastal and marine environments is of concern to ecosystem health and sustainable livelihoods worldwide. Historically, a considerable amount of waste pollution was comprised of plastics and tires, and now electronic waste is becoming an increasing component of land-based sources of pollution.

Each year, 275,000 tons of waste pollution ends up in Caribbean open-air dumps or local waterways.⁵ The impact of waste pollution is of particular relevance to island nations dependent on coastal and marine resources, and concomitantly struggling to adapt to climate variability and change.⁶

Most Caribbean island nations have enacted legislation to govern the operation of solid waste facilities, as well as prevent open dumping and littering. However, only a few have promulgated regulations to provide guidance to ensure laws are enforced and associated penalties for non-compliance are implemented. Enacting environmental regulations is sometimes criticized as preventing development in emerging markets; and it is true that excessively stringent measures impose market access restrictions and cause limitations on competitiveness. However, due to the fragility of island ecosystems, economic development needs to be balanced with preserving the environmental security. Finally, just replicating environmental regulations from other regions of the world has not succeeded as they do not match the technical requirements and socio-economic reality of Caribbean, and do not take the institutional capabilities of the society that has to implement them into consideration.

Action Items

- Support the development and implementation of relevant arrangements, such as the United Nations Environment Programme GPA for the Protection of the Marine Environment from Land-based Activities.
- Facilitate the development of plastic recovery systems on each island nation, with a priority on implementing plastic bottle redemption programmes and bans on single-use plastics and expanded polystyrene.
- Establish a cooperative amongst Caribbean island nations to contract for the processing of SWM materials that tend to be open-dumped such as tires and electronic waste, but for which local processing options are not available.
- Design cradle to the grave standards for registering automobiles and that the proper, final management of an automobile needs to be documented at the end of its life. These standards could include that advanced management fees are included in the purchase of new vehicles.
- Where necessary, establish SWM authorities on each island nation where their governance roles and responsibilities, as well as guiding principles on how SWM authorities interface with other government ministries, departments and their board of directors is clearly defined. Establishing these SWM authorities will most likely require the adoption of new or amendment of existing solid waste laws. For islands

⁵ *Solid Waste and Marine Litter*, United Nations Environment Program (UNEP) and Caribbean Environmental Program (CEP), 2015

⁶ *Country Analysis on Plastic Waste*, Roberts Caribbean Ltd, 2015

that already have SWM authorities, information on how they are structured, and function will be shared with high-level ministers.

- Distribute a white paper to island economic, social and environmental officials on the environmental and social costs of not having sufficient regulations to govern solid waste.
- Create a regional database of all SWM promulgated regulations from the Caribbean region. This database will include case studies on how these islands promulgated and enforced SWM regulations, as well as sample regulatory language and penalty schedules.
- Establish island-specific task forces comprised of legislative and environmental legislative ministries, potential regulated community, enforcement agents and judiciary branches to promulgate SWM regulations.

NATURAL DISASTER DEBRIS

Issues

Caribbean islands struggle with the effects of disasters, many of which have increased in intensity and some of which have been exacerbated by climate change. These disasters can disproportionately affect small islands, and there is a critical need to increase preparedness to manage the extensive amount of wastes these disasters generate. Infrastructure resources available to individual Caribbean islands in order to respond to natural disaster waste has been inadequate to effectively, respond to these crises. Without the necessary resources, affected islands have not fully succeeded in preventing this debris from becoming waste pollution and a health hazard.

Action Items

- Design a regional disaster debris management training course where local officials would learn how to prepare a disaster management plan, mobilize clean-ups and reuse debris materials, such as galvanized roofing.
- Harmonize national and regional waste management disaster recovery plans, where applicable, to increase synergies and coherence.
- Promote cooperation and capacity building, as well as investment in disaster risk management in the public and private waste management sectors.
- Procure a mobile, construction and demolition debris shredder that can be transported to islands after natural disasters⁷.

⁷ This type of equipment costs approximately \$700,000 USD

LANDFILL DIVERSION AND RECYCLING

Issues

Caribbean island communities face unique challenges when diverting solid waste from landfill disposal, specifically:

- **Markets** – Using recyclables as a feedstock in manufacturing, which is the most profitable off taker of recyclable commodities (i.e. metals, glass and plastic), is virtually non-existent on island communities. Consequently, the cost of collecting, processing and most importantly, transporting recyclable commodities cannot be offset by local recycled-content feed stock sales. Further complicating the situation is that many Caribbean islands do not have deep-water ports to attract a broker that would transport their recyclables to the more lucrative markets.
- **Informal Recycling** – Both the public and private sector are conducting numerous recycling activities throughout the region, some of which are formally structured. However, much of it is through unorganized scavenging. In fact, over 100,000 families and 200,000-300,000 children in the region survive through selling dumped material and working in hazardous and unhealthy conditions⁸.
- **Trade Barriers** - While recyclables may be collected, many recyclers were not able to sell these materials for conversion into a new product either on or off-island. Frequently, recyclers stockpile these materials for months; and sometimes, years. During the rainy season, some of these stockpiled recyclables run-off into waterways and become marine litter. Recent developments in the international markets for restricting contamination in recyclables, may require island nations to implement source-separated recycling collection programmes and for recyclers to purchase extremely high-tech processing equipment to eliminate contamination. However, even with this level of investment, island nations may not be able to sell the recyclables at a price high enough to recover their costs.
- **Public Participation** – Most landfill-diversion programmes, such as recycling and composting, require a certain amount of separating of recyclables at the point of generation (source separation) to produce products that have high market value. Therefore, behavioral, public awareness, education, communication and other changes are required to encourage source-separation.

Action Items

- Create a regional platform to share research and best practices for landfill diversion technologies to facilitate the development of technologies, programmes and

⁸ *Solid Waste and Marine Litter*, United Nations Environment Program (UNEP) and Caribbean Environmental Program (CEP), 2015

strategies to divert waste from landfill disposal through reduction, reuse, composting and strategies to foster research on the technological development and for the implementation of appropriate landfill diversion systems.

- Develop a “hub and spoke” system for transporting recyclables within the region. A “hub and spoke” system involves recycling hubs shouldering the financial burden of operating a recycling centre that processes material, while benefitting from capturing value from the recyclable materials that they market. The spokes provide the hubs with their recyclables to process. Spoke communities do not benefit from the sale of the recyclables, but they are not liable for the expenses of operating a recycling processing centre. Oftentimes, recycling hubs exist within communities with slightly larger population centres and the spokes feed into the hub system from remote areas with a small population.
- Model a system similar to the North Sea Resources Roundabout that allows recyclables to cross national borders. Europe has identified the need to move towards a circular economy. The first step towards a circular economy is to make better use of secondary resources through reuse and recycling. Most value-chains are however cross-border and (interpretation of) regulation and legislation is often national. Companies that want to increase recycling or use more secondary resources to replace dependency on primary resources encounter barriers. Once the Caribbean region establishes a uniformed definition of resources versus waste, as well as resource processing, a system to allow the transportation of resources could be created.
- Optimize the composting of organics on Caribbean island Nations by creating infrastructures for the collection of source-separated organics. Also, explore the potential to produce energy from biogas from composting of organic waste.
- Establish performance standards for designing and operating compost facilities, as well as selling compost as a soil amendment.
- Local solid waste authorities operate a master composter programme whereby, several individuals from each community would be certified as master composters. The master composter training could include classroom sessions or field trips, as well as practical education through volunteering in the community. In the classes, trained Master Composters or experts will provide in-depth instruction about various aspects of composting and the importance of composting in waste management. Additionally, trainees receive instruction on how to be effective teachers for a variety of age groups and in a range of settings. These individuals would then educate their neighbors on how to backyard compost. Solid waste authorities would also work with local home improvement and gardening stores to sell backyard composting bins.
- Ban the practice of children recovering recyclables at SWM disposal facilities.
- Adopt policies to assure that all recyclers are treated with dignity and respect for their welfare and wellbeing.

PUBLIC PRIVATE PARTNERSHIPS/INNOVATION

Issues

The private sector plays an increasingly important role in achieving sustainable SWM systems, including progressing waste management projects through public-private partnerships (PPPs). In addition, sustainable development will also depend, *inter alia*, on intergovernmental and international cooperation and the active engagement of both the public and private sectors. However, private sector investment in Caribbean solid waste management infrastructure facilities, such as landfills, transfer stations, recycling facilities and waste-to-energy plants is extremely limited in the region. The PPPs could also play a role in resolving issues such as the transport of secondary materials or waste from the islands, which is problematic due to high cost of transportation. In addition, there is room for other, more innovative policies such as the option to replace buying goods with buying services. As an example, buying air-condition as a service instead of buying the machine, leaving the responsibility of the machine with the company who would be providing the whole package of service to the customer, including maintenance, remanufacturing and eventually sustainable disposal.

Beyond PPPs, innovative strategies to increase landfill diversion requires local governments to foster entrepreneurship and innovation, build capacity and increase the competitiveness and social entrepreneurship of micro, small and medium-sized enterprises on each island. For all of these initiatives, it is essential to promote inclusive participation of all people, including the poor, women, youth and persons with disabilities.

Action Items

- Create an enabling environment to attract more private investment in building and maintaining waste management collection, recycling, composting, WTE and disposal systems. This will include demonstrating that sufficient funding is available to allow private entities to earn a profit from development of SWM facilities and that regulations for governing SWM facilitates will remain constant through the investment life of a project.
- Mitigate the risk of private investment by designing a template that allows individual island nations to prepare business case analyses associated with developing solid waste management facilities. Local Chambers of Commerce could establish a mentoring programme to assist SWM authorities design business plans.
- Financial ministries endorse the public sector financial requirements before issuing tender documents.
- Institute minimum performance and experience standards for private developers that demonstrate their technical, financial and environmental experience to develop SWM systems on island nations.
- Explore the potential of adopting innovative PPPs addressing critical issues such as high cost of transport of waste and recycled materials from the island and new

innovative schemes such as “take-back” and “renting instead of buying” to move the responsibility of disposal from consumer to producer.

SUMMARY OF ACTION ITEMS

Exhibit 1 summarizes the action items and identifies whether they are most appropriate to be initiated at national or regional level.

Exhibit 1. Action items and level of implementation

Action Item	Regional Implementation	National Implementation	Both
COMMUNICATION AND COLLABORATION			
Convene an intergovernmental HLF of Ministers on an annual basis	✓		
Establish a network for Solid Waste Professionals	✓		
Create a knowledge platform	✓		
Inventory potential waste management partner activities and reports			✓
Design regional and local aligning education campaigns			✓
STRATEGIC PLANNING			
Develop a strategic planning tool box	✓		
Share experiences of strategic planning across the region (e.g. through webinars)	✓		
Establish a regional policy to incentivize strategic planning	✓		
Convene a stake-holder based planning and implementation committee		✓	
Identify strategic plan monitoring mechanisms and key performance indicators		✓	
Promulgate regulations to support strategic plan recommendations		✓	
FINANCIAL			
Evaluate the financial and economic realities of current approaches in regional waste management			✓
Assess the value of additional funding on improved efficiency, cost recovery and eventual sustainability		✓	

Action Item	Regional Implementation	National Implementation	Both
Create a database of the capital costs associated with various solid waste equipment	✓		
Benchmark how regional and global SIDS fund their solid waste management systems	✓		
Establish a minimum dollar per capita ratio that regional islands could use as a guideline when developing annual budgets	✓		
Identify case studies where investing in a waste management system has significant improved cost-effectiveness of operations or when inaction has adversely affected programme performance, local economy or the environment			✓
Explore executing a regional memorandum of understanding whereby all island nations in the region will commit to allocating revenue from SWM levies to fund SWM programmes	✓		
Identify mechanisms to increase the cost-effectiveness of operating and developing solid waste management systems			✓
Work with each island nation to adopt a “polluter pays policy” whereby generators pay either directly or indirectly for the management of SWM		✓	
Assemble the criteria for receiving loans and grants from multi-lateral development banks and aid agencies, as well as attracting private investors.	✓		
INFRASTRUCTURE			
Conduct a forum to provide guidance on making SWM infrastructure projects “bankable”	✓		

Action Item	Regional Implementation	National Implementation	Both
Determine the remaining capacity of SWM disposal facilities. Begin siting and financing a new disposal facility when existing facilities have less than five years of capacity.		✓	
Create regional guiding principles for contracting for or operating SWM collection, processing and disposal systems	✓		
Determine the cost per capita or cost per ton to cost effectively and efficiently collect and manage waste on each island.			✓
Develop criteria for vetting waste management technologies			✓
All Caribbean island nations that are signatories of MARPOL Annex 5 establish uniformed user fees to recover all costs associated with providing facilities to manage ship-generated wastes			✓
Adopt regional regulations to assure that MARPOL Annex 5 facilities are designed, operated and regulated in uniformed manner	✓		
Provide local officials with extensive training on inspecting waste, monitoring and water sampling at MARPOL Annex 5 facilities			✓
Prepare a financial forecast analysis that determines the revenue required to design, construct, maintain, monitor and close MARPOL Annex 5 facilities			✓
WASTE POLLUTION			
Support the development and implementation of relevant agreements, conventions and protocols			✓

Action Item	Regional Implementation	National Implementation	Both
Develop a regional infrastructure to support plastic recovery systems on each island nation			✓
Establish a cooperative amongst Caribbean island nations to contract for the processing of SWM materials that tend to be open-dumped, such as tires	✓		
Design cradle to the grave standards for registering automobiles		✓	
Where necessary, establish SWM authorities on each island nation		✓	
Distribute a white paper to economic, social and environmental officials on the environmental and social costs of not having sufficient regulations to govern solid waste			✓
Create a regional database of all SWM promulgated regulations from the Caribbean region	✓		
Establish island-specific task forces to promulgate regulations to prevent pollution		✓	
NATURAL DISASTER DEBRIS			
Design a regional disaster debris management training course	✓		
Harmonize national and regional waste management disaster recovery plans			✓
Promote cooperation and capacity building, as well as investment in disaster risk management		✓	
Procure a mobile, construction and demolition debris shredder	✓		
LANDFILL DIVERSION AND RECYCLING			
Create a regional platform to share research and best practices for landfill diversion technologies	✓		

Action Item	Regional Implementation	National Implementation	Both
Develop a “hub and spoke” system for transporting recyclables within the region	✓		
Model a system similar to the North Sea Resources Roundabout that allows recyclables to cross national borders			✓
Creating infrastructure for the collection of source-separated organics		✓	
Establish performance standards for designing and operating compost facilities, as well as selling compost as a soil amendment.		✓	
Operate master composter programmes whereby, several individuals from each community would be certified as master composters		✓	
Ban the practice of children recovering recyclables at SWM disposal facilities		✓	
Adopt policies to ensure that all recyclers are treated with dignity and respect for their welfare and wellbeing		✓	
PUBLIC-PRIVATE PARTNERSHIPS/INNOVATION			
Create an enabling environment to attract more private investment in waste management systems		✓	
Design a template that allows individual island nations to prepare business case analyses associated with developing solid waste management facilities	✓		
Establish a mentoring programme where local Chambers of Commerce assist SWM authorities design business plans		✓	

Action Item	Regional Implementation	National Implementation	Both
Financial ministries endorse the public sector financial requirements before issuing tender documents		✓	
Explore the potential of adopting innovative PPPs addressing critical issues such as high cost of transport of waste and recycled materials from the island and new innovative schemes such as “take-back” and “renting instead of buying”			✓

Appendix A Examples of Regional Best Practices

CARIBBEAN WASTE COLLECTIVE- ARUBA, BONAIRE & CURACAO

In September 2016, the Dutch Ministry of Infrastructure and Environment convened stakeholders from Aruba, Bonaire and Curacao (ABC Islands) to identify common factors in waste management between the islands. These include:

- A need to improve waste management and stimulate the transition to a Circular Economy;
- Opportunities for broad economic development as well as self-sustainability;
- Economies of scale which hinder progress; and,
- A need for stakeholders to collaborate.



The stakeholders share a vision that waste recycling is valuable to the economy on the ABC Islands and consequently, established the Caribbean Waste Collective (CWC). It is the goal of the CWC to mobilize partners to join forces and stimulate a new economic sector by turning waste into value. To achieve this, the ABC Islands cooperate to facilitate waste becoming resource and thereby, harnessing the full potential of the Circular Economy on the ABC Islands.

The ABC Islands signed a pledge to increase and execute inter-Island cooperation in the field of waste recycling that included the following provisions:

- Raise the voices regarding the message: waste has value;
- Support the website as a tangible platform for the stakeholders to market their activities and to support the goals of the CWC;
- Connect (new) stakeholders and foster collaboration among them;
- Share general information regarding waste recycling;
- Share information regarding regional and international best practices;
- Share information regarding the execution of current and future projects;
- Support the CWC in achieving government support to facilitate the joint stakeholders;
- Prove that the waste-recycling sector will outperform the traditional economical sector on the ABC Islands regarding economic growth figures; and,
- Promote the waste recycling sector as a whole.

ANTIGUA & BARBUDA – PLASTIC BAG BAN

On July 1st, 2016, the nation of Antigua and Barbuda started its ban of single use plastic grocery bags. This followed a ban on the importation of all plastic bags, except those used for garbage collection and disposal. A Styrofoam ban became effective on July 1, 2017. Health Minister Molwyn Joseph led and championed these initiatives. Minister Joseph also facilitated numerous consultations with stakeholders and participated in TV debates. Due to this process, all key stakeholders eventually supported these bans.

When the government launched the ban on plastic grocery bags, they also distributed complimentary, reusable bags at supermarkets. The ban on plastic bags began at supermarkets, but the ban is now expanding to all retail establishments. The government also provided tax incentives to make alternatives to Styrofoam cost equivalent.

BARBADOS BOTTLE BILL

The Barbados Returnable Containers Act (BRCA) was passed on June 1st, 1986. Barbados originally introduced it to minimize litter from the roadways of Barbados. Major bottling companies which transitioned production methods from glass to polyethylene terephthalate (PET) plastic bottles contributed to this increased littering. The BRCA provides a deposit system on the sale of beverage containers.

The BRCA provided for the following:

- The control of the sale of beverages in beverage containers
- The payment of a deposit on beverage containers
- A refund for the return of those containers
- The final disposal of unused or usable containers

The BRCA refund value of a beverage container is set out in the following schedule:

- | | |
|--|----------|
| • For every glass container | 20 cents |
| • For every container other than a glass container | 10 cents |

The BRCA created multiple economic, social and environmental benefits including:

- Establishment of a formal recycling sector
- Creation of jobs
- Minimization of the negative environmental impacts of beverage containers
- Diversion of valuable recyclable material from the landfill

However, the BRCA also experiences challenges including:

-
- The RCA does not account for all water, milk, alcoholic, non-alcoholic and non-beverage containers
 - Lack of education
 - Collection
 - Enforcement

However, the BRCA is in the process of being revised and expanded to provide a more comprehensive instrument for the collection, transportation and recycling of containers.

NEVIS – MONTHLY HOUSEHOLD FEES

The garbage collection levy has been a generally successful means of revenue generation for the Nevis Solid Waste Management Authority (NSWMA). The Nevis Electricity Utility Company (NEVLEC), collects the fee and deposits it into the NSWMA account on, or before the 12th of each month. The revenue paid to NSWMA is always the fees collected from the previous month.

BELIZE LANDFILL TIPPING FEES

The Belize solid waste management system includes five waste transfer stations and one sanitary landfill. The IDB financially supported this integrated waste management system. The transfer station assesses tipping fees based on the volume of material delivered. The transfer stations consolidate individual loads of garbage into larger vehicles that transport the garbage to the landfill. This type of system reduces waste collection costs as well as damage to local roads. Belize has not experienced an increase in open dumping because of tipping fees. In addition to the tipping fee, Belize assesses an environmental tax on imports that will turn into waste; the Authority get a small portion.



Belize officials recognized that tourism drives economy and this perspective facilitated the government investing in waste infrastructure. A challenge that Belize faces is multiple agencies playing a role in the waste management system. This sometimes causes duplication of efforts, and policies/agendas that do not always align.

ARUBA AUTOMATED COLLECTION



Aruba has successfully deployed an automated waste collection system where residents receive waste collection carts. The carts prevent animals from scavenging the bags and therefore, contain garbage outside of their home. Aruba numerically codes carts, assigns a cart to a home and catalogues code/home to prevent theft. The carts are collected once a week, which has significantly reduced the country's waste collection costs.

GRENADA COMPOSTING

Grenada is developing a facility to professionally, compost green wastes. Prior to constructing these facilities, Grenada is conducting market studies to assure that the compost can be sold at a high-enough value to create a financially, self-sustaining facility or at least minimize the need for government subsidies.

ARUBA LITTER LAW ENFORCEMENT

Aruba uses city inspector to enforce litter/open dumping regulations, which has decreased the occurrence of these activities.