Caribbean Waste Management Conference
*SIDS Approaches to Waste Management And*
*The Circular Economy*
Kingston, Jamaica
July 4-6, 2017

Prepared for:

UN Environment (UNEP)
Government of Jamaica
Government of the Netherlands

Prepared by:

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1 ACRONYMS

ABC Islands
AFD
BCRC
BRCA
CARPHA
CDB
CEP
COTED
CWC
CWWA
EPR
FOG
GEF
GPA
ICCC
IETC
ISWA
IWCAM
IWECO
KSP
MEA
MRF
MOOC
MSW
NEVLEC
NSWMA
NGO
PAHO
PET
PMC
PPP
RDF
RFP
SAT
SDG
SIDS
SLSWMA
SWANA
UN
UNEA
WEEE

Aruba, Bonaire and Curacao
Agence Française de Développement
Basel Convention Regional Centre
Barbados Returnable Containers Act
Caribbean Public Health Agency
Caribbean Development Bank
Caribbean Environment Programme
Council for Trade and Economic Development
Caribbean Waste Collective
Caribbean Water and Waste Water Association
Extended Producer Responsibility
Food Oil and Grease
Global Environment Facility
Global Programme of Action for the Protection of the Marine Environment from Land-based Activities
International Coastal Cleanup
International Environmental Technology Centre
International Solid Waste Association
Integrating Watershed & Coastal Area Management
Integrating Land, Water & Ecosystem Management
Knowledge Sharing Programme
Multilateral Environmental Agreement
Material Recovery Facility
Massive Open Online Course
Municipal Solid Waste
Nevis Electricity Utility Company
Nevis Solid Waste Management Authority
Non-Governmental Organization
Pan American Health Organization
Polyethylene Terephthalate
Plastic Mining Company
Public-Private-Partnership
Refuse Derived Fuel
Request For Proposal
Sustainable Assessment of Technology
Sustainable Development Goals
Small Island Developing States
Saint Lucia Solid Waste Management Authority
Solid Waste Association of North America
United Nations
United Nations Environment Assembly
Waste Electric and Electronic Equipment
WTE                Waste-to-Energy
2 NEED

In Caribbean island nations, both upstream waste collection and downstream waste disposal present significant financial, environmental, and health challenges. Upstream, waste collection systems account for in excess of 50% of a waste management authority’s budget and the revenues they receive frequently do not fully fund waste collection expenditures. Lack of sufficient funds prevents 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. As a result, 275,000 tons per day ends up in open-air dumps or local waterways. Storms and coastal flooding events often sweep this waste from the open-air dumps and rivers into the sea. Additionally, over 100,000 families and 200,000-300,000 children in the region survive through selling dumped material and working in hazardous and unhealthy conditions.

Waste that is not collected upstream or disposed of in a sanitary manner downstream can result in illnesses such as dengue fever. The common practice of uncontrolled burning accounts for half of the dioxin and furan emissions on island nations. Finally, contaminated soils and waters can destroy livelihoods when commercial agriculture and fishing are no longer viable due to contaminated soils and waters. The people who are most vulnerable to these conditions are 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 of poor waste management consequences.

In the 1990s, many Caribbean nations received technical, regulatory, planning and financial support from entities such as the World Bank, Inter-American Development Bank (IDB), and Caribbean Development Bank (CDB) to establish integrated systems for collection and disposal of waste in regulated landfills. Due to this support, the population with access to

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1 Solid Waste and Marine Litter, UN Environment Programme and Caribbean Environmental Programme (CEP), 2015
2 ibid
3 Regional Evaluation on Urban Solid Waste Management in Latin America and Caribbean, Pan American Health Organization (PAHO), 2010
4 ibid
a system of regular waste collection and properly managed landfills increased from approximately 20% in 2000 to over 50% by 2010\(^5\). However, the trajectory of improving waste management in island nations has stalled and is, in fact, regressing due to lack of national and regional strategic planning, funding and the implementation of programmes and projects to decrease dependency on landfills through establishing a Circular Economy.

3 CIRCULAR ECONOMY

According to the Ellen MacArthur Foundation, a Circular Economy is restorative and regenerative by design and aims to keep products, components, and materials at their highest utility and value at all times. The concept distinguishes between technical and biological cycles. As envisioned by the originators, a Circular Economy is a continuous positive development cycle that preserves and enhances natural capital, optimizes resource yields, and minimizes system risks by managing finite stocks and renewable flows. It works effectively at every scale. Exhibit 1 provides an overview of the Circular Economy concept.

\(^5\) ibid
The circular economy rests on three principles, each addressing several of the resource and system challenges that industrial economies faces.

- **Principle 1: Preserve and enhance natural capital.** This starts by dematerializing utility—delivering utility virtually, whenever possible. When resources are needed, the circular system selects them wisely and chooses technologies and processes that use renewable or better-performing resources, where possible. A Circular Economy also enhances natural capital by encouraging flows of nutrients within the system and creating the conditions for regeneration of, for example, soil.

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6 Ellen Macarthur Foundation
• **Principle 2: Optimize resource yields.** This means designing for remanufacturing, refurbishing, and recycling to keep components and materials circulating in and contributing to the economy. Circular systems use tighter, inner loops whenever they preserve more energy and other value, such as embedded labor. These systems also keep product loop speed low by extending product life and optimizing reuse. Sharing in turn increases product utilization. Circular systems also maximize use of end-of-use bio-based materials, extracting valuable bio-chemical feedstocks and cascading them into different, increasingly low-grade applications.

• **Principle 3: Foster system effectiveness.** This includes reducing damage to human utility, such as food, mobility, shelter, education, health, and entertainment, and managing externalities, such as land use, air, water and noise pollution, release of toxic substances, and climate change.

**CIRCULAR ECONOMY CHARACTERISTICS**

While the principles of a Circular Economy act as principles for action, the following fundamental characteristics describe a pure Circular Economy:

• **Design out waste.** Waste does not exist when the biological and technical components (or ‘materials’) of a product are designed by intention to fit within a biological or technical materials cycle. The biological materials are non-toxic and compostable. Technical materials—polymers, alloys and other man-made compounds— are designed to be used again with minimal energy and highest quality retention (whereas recycling, as commonly understood, results in a reduction in quality and feeds back into the process as a crude feedstock).

• **Build resilience through diversity.** A Circular Economy recognizes the world is quickly evolving and values modularity, versatility, and flexibility. Diverse systems with many connections and scales are more resilient in the face of external shocks than systems built simply for efficiency—throughput maximization driven to the extreme results in fragility.

• **Work towards energy from renewable sources.** Systems should ultimately aim to run on renewable energy—enabled by the reduced threshold energy levels required by a restorative, circular economy. The agricultural production system runs on current solar income but significant amounts of fossil fuels are used in fertilizers, farm machinery, processing and through the supply chain. More integrated food and farming systems would reduce the need for fossil-fuel based inputs and capture more of the energy value of by-products and manures.

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7ibid
• **Think in systems.** The ability to understand how parts influence one another within a whole, and the relationship of the whole to the parts, is crucial. Systematic thinking considers elements in relation to their environmental and social contexts. Systems thinking usually refers to the overwhelming majority of real-world systems: these are non-linear, feedback-rich, and interdependent. In such systems, imprecise starting conditions combined with feedback lead to often surprising consequences, and to outcomes that are frequently not proportional to the input. Such systems cannot be managed in the conventional, ‘linear’ sense, requiring instead more flexibility and more frequent adaptation to changing circumstances.

• **Think in cascades.** For biological materials, the essence of value creation lies in the opportunity to extract additional value from products and materials by cascading them through other applications. In biological decomposition, be it natural or in controlled fermentation processes, material is broken down in stages by microorganisms like bacteria and fungi that extract energy and nutrients from the carbohydrates, fats, and proteins found in the material. For instance, going from tree to furnace forgoes the value that could be harnessed via staged decomposition through successive uses as timber and timber products before decay and eventual incineration.

## 4 CWM CONFERENCE PURPOSE AND AGENDA

### PURPOSE

As part of its global action on waste as a resource, UN Environment entered into agreement with the Dutch Ministry of Infrastructure and the Environment to cooperate on waste management in the Caribbean region, including the organization of a Caribbean Waste Management Conference “*SIDS approaches to waste management and the circular economy*” (*CWM Conference*).

CWM Conference had multiple purposes. First was to introduce participants to global solid waste agendas and protocols. Second, 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 strategy that fosters an environmentally and financially sustainable solid waste management system. Third, was to create a dialogue about the Circular Economy in the Caribbean region and explore opportunities for island nations to incorporate the Circular Economy principles and characteristics into their waste systems. This dialogue included creating baseline of what individual islands are currently doing with respect to promoting a Circular Economy and how to regionally-scale individual island initiatives.

### AGENDA

A team of representatives from UN Environment, the Caribbean Water and Wastewater Association (CWWA), the Government of the Netherlands, and international solid waste consultants designed the agenda (Table 1) for the CWM Conference, which allowed
participants to be introduced to international best practices in waste management and the Circular Economy, as well as share their own experiences. The agenda team also structured the agenda to provide opportunities for small group breakout sessions, and networking.

### Table 1. Agenda

<table>
<thead>
<tr>
<th>Tuesday 4th July – Setting the Scene</th>
<th>Agenda Items</th>
<th>Annotations</th>
<th>Comments</th>
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<tbody>
<tr>
<td>8.30 am to 9.00 am</td>
<td>Registration</td>
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<tr>
<td>9.00 am to 9.30 am</td>
<td>Opening Ceremony</td>
<td>Welcome remarks by Jamaica Minister responsible for the Environment &amp; brief remarks by Ministry of Environment, Kingdom of the Netherlands, UN Environment and CWWA</td>
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<tr>
<td>9.30 am to 9.45 am</td>
<td>Introduction of Participants and Conference Expectations</td>
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<tr>
<td>9.45 am to 10.30 am</td>
<td>• Objectives of Meeting and Agenda Review</td>
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<td>UN Environment</td>
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<td></td>
<td>• Background &amp; Context of Conference</td>
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<tr>
<td>10.30 am to 11.00 am</td>
<td>Group Photo/Coffee Break</td>
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<tr>
<td>11.00 am to 11.45 am</td>
<td>• Global Agenda - 2030/SAMOA Pathway/UNEA</td>
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<td>UN Environment (Jordi Pon)</td>
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<td></td>
<td>• Waste Management in SIDS: a Growing and Cross Cutting Issue</td>
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<td>IETC (Claudia Giacovelli)</td>
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<td></td>
<td>• Waste management a cross cutting issue. High priority waste streams (#CleanSeas Campaign)</td>
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<td>• What are specific conditions that need to be considered when discussing waste management on SIDS? Things like scale, role of transport etc</td>
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<td></td>
<td>• Where are we at? Where are we heading? Inform on SIDS WM outlook and upcoming group work session</td>
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<tr>
<td>11:45 am to 12:15 am Q&amp;A</td>
<td>• Waste Management in Caribbean SIDS: an Overview of Draft</td>
<td></td>
<td>Jordi Pon, UN Environment/Consultant</td>
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<td></td>
<td>• Presentation of relevant available information on major trends, high priority waste streams and situation of waste management in</td>
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<tr>
<td>Time</td>
<td>Session Details</td>
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<tr>
<td>12:15 pm to 12:45 pm</td>
<td><strong>Caribbean Waste Collective</strong> - Aruba, Bonaire &amp; Curacao Leading the Way</td>
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| 12:45 pm to 2:00 pm | **Mitigating and Adapting to Plastics**  
- Antigua & Barbuda – Plastic Bag Ban  
- Trinidad – Styrofoam Ban  
- Barbados - Bottle Bill  
- Jamaica – Plastic Waste project and Trash Free Program  
- Plastic Mining Cooperation Commitment/Case Study |
| Lunch              |                                                                                   |
| 2:00 pm to 3:30 pm | **Caribbean WM Strategy**  
- Output of a IDB/CWWA Regional workshop, October 2016  
- Caribbean SIDS; identification of practical experiences and best practices on waste management in (Caribbean) SIDS  
- Evan Cayetano – WSA Sr. Specialist, WSA/CT |
|                   | **Mitigating and Adapting to Plastics**  
- Antigua & Barbuda – Plastic Bag Ban  
- Trinidad – Styrofoam Ban  
- Barbados - Bottle Bill  
- Jamaica – Plastic Waste project and Trash Free Program  
- Plastic Mining Cooperation Commitment/Case Study |
|                   | **Moderated by Karen Luken, UN Environment Consultant**  
- Overview of plastic initiative  
- Why the plastic initiative was pursued  
- How the plastic initiative was implemented  
- Public Private Partnerships (PPP) in developing the plastic initiative  
- Challenges in implement plastic initiative  
- Results of plastic initiative  
- Key learnings (what would you do different; repeat; how could other island nations replicate) |
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<tr>
<th>Time</th>
<th>Session</th>
<th>Questions</th>
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<tr>
<td>3.30 pm to</td>
<td><strong>Refreshment Break</strong></td>
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<tr>
<td>3.45 pm</td>
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<tr>
<td>3:45 to 4:30</td>
<td><strong>Fostering Financially Sustainable Waste Management Systems</strong></td>
<td>- Nevis – Monthly household Fees and Converting Waste to Electricity as a revenue source</td>
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<td>- Belize – Landfill Tipping Fees</td>
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<td>- Moderated by UN Environment Consultant</td>
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<td></td>
<td></td>
<td>- What are the household fee and tipping rate structures</td>
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<td></td>
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<td>- How were fee structures derived</td>
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<td>- What are your annual waste management budgets on a per capita basis?</td>
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<td>- What percent of “fee” revenue pays for that?</td>
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<td>- What are other revenue sources?</td>
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<td>- How did you secure support for solid waste fees?</td>
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<td></td>
<td></td>
<td>- Key learnings (what would you do different; repeat; how could other island nations replicate)</td>
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<tr>
<td>4:30 – 5:30</td>
<td><strong>Governing Transformation</strong></td>
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<td>- Saint Lucia – National Waste Management Strategy and waste collection contracts</td>
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<td></td>
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<td>- Jamaica – Open Dumping and Ship Waste</td>
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<td>- Bahamas – PPPs in landfill management</td>
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<td></td>
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<td>- Moderated by UN Environment Consultant</td>
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<td></td>
<td></td>
<td>- Overview of regulations and/or contracts and how they are being implemented</td>
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<td></td>
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<td>- How regulations/contracts are being enforced</td>
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<td>- Penalty enforcement</td>
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Contractor fees.

- Key learnings (what would you do different; repeat; how could other island nations replicate)

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<th>Close of Day 1</th>
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<th>Wednesday 5th - Networking for WM Improvements</th>
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<tr>
<td><strong>Agenda Items</strong></td>
<td><strong>Annotations</strong></td>
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<tr>
<td>9:00 am to 9:30 am Recap of Day 1 and Intro of Day 2</td>
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<tr>
<td>9:30 am to 10:30 am Small Island Developing States (SIDS) Waste Management Outlook</td>
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<tr>
<td>10:30 am to 11:00 am To the drawing board of the SIDS WM Outlook</td>
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<tr>
<td>11.00am to 11.30am Refreshment Break</td>
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<tr>
<td>11.30 am to 1:00 pm To the drawing board of the SIDS Waste Management Outlook.</td>
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<tr>
<td>1:00 pm to 5:00 pm Field Trip</td>
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<tr>
<td>6.00 pm to 8.00 pm Conference cocktail reception and project launch</td>
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<th>Thursday 6th – Together, moving forward</th>
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<tr>
<td><strong>Agenda Items</strong></td>
<td><strong>Annotations</strong></td>
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<tr>
<td>9:00 am to 10:30 pm Recap &amp; Work Groups – Action Plan &amp; Inputs to UNEA</td>
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<tr>
<td>10:30 am to 11:00 am Refreshment Break</td>
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<tr>
<td>11:00 am to 12:30 pm Work Groups (continued)</td>
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<tr>
<td>12:30 pm to 1:30 pm Lunch</td>
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<tr>
<td>1:30 pm to 3:30 pm Report back from Working Groups</td>
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<tr>
<td>3:30 pm to 4:00 pm Refreshment Break</td>
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<tr>
<td>4:00 pm to 4:45 pm Collaboration within the region – Next steps</td>
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5 CWM CONFERENCE PARTICIPANTS AND PROCEEDINGS

PARTICIPANTS

To facilitate a robust and multi-perspective dialogue on establishing a platform for a regional solid waste strategy incorporating the Circular Economy principles and characteristics into Caribbean Island waste systems, the CWM Conference planning team invited solid waste professionals from local government, private technology developers, academia, non-governmental organizations (NGOS), trade associations, financial institutions and private consulting firms.

Over 75 individuals participated in the CWM Conference, and Attachment A provides the details of countries which they represent or in which they reside, Name (if applicable), Title and Designation.

PROCEEDINGS

Opening Remarks

Vincent Sweeney, Head, Caribbean Sub-Regional Office, UN Environment

Mr. Sweeney welcomed everyone to the first conference organized by the Caribbean Sub-Regional Office for United Nations (UN) Environment. Mr. Sweeney shared that UN Environment just opened a brand new Sub-Regional Office for the Caribbean last year. Based in Kingston, Jamaica, this office will bring UN Environment’s full range of expertise and services closer to the Caribbean. He also hopes, through this office, to improve UN Environment’s relevance, and allow for greater impact of its work.

UN Environment currently works within the framework of seven Sub-Programmes. These include Disasters & Conflicts; Climate Change; Environmental Governance; Environment Under Review; Resource Efficiency; Ecosystems Management; and Chemicals & Waste. Therefore, UN Environment works in a number of areas relevant to the conference. Beyond the work of the Secretariat for the Cartagena Convention, which has been UN Environment’s main presence in the Caribbean and has worked throughout the Wider Caribbean on land-based sources of marine pollution, many of the sub-programmes of UN Environment, mentioned above, particularly those related to Chemicals and Waste and Resource Efficiency, are quite relevant to this conference.
Arthur Eijs, Ministry of Environment, Kingdom of the Netherlands

Mr. Eijs shared that the Netherlands initiated a programme in 2016 on the Circular Economy, aimed at the Netherlands using 50% less raw materials in 2030. All ministries, government agencies and the whole Kingdom of the Netherlands share and work together to implement this programme.

The first step focused on the former Dutch Antilles, and brought together stakeholders from these islands in a conference, co-hosted by the government of Curacao and UN Environment, in Willemstad, September 2016. Stakeholders came from the public sector as well as the private sector, from science, NGO’s, the tourism sector and many others. This first step taught them a number of lessons that led to three, main conclusions:

- The urgent need for stepping up waste management efforts. SIDS, in many respects, share the same agenda and challenges as every other nation. The SDG-framework and agenda is there for all of us. However, SIDS also face specific challenges, as recognized in the Samoa Pathway strategy. The element of scale, the dependency on high levels of import of goods, the important role of affordable and reliable transport and the particular challenges from the tourism sector are only some examples.

- Recognition of the fact that everybody has to do his or her bit. Action is required from governments, in setting the overall course, determining the ambitions, and putting in place policy frameworks that foster entrepreneurship and innovation for sustainability. Action is also required from the private sector, rethinking their current business models, mitigating impacts, and developing new business models for resource efficiency, circularity and recycling, as well as new and innovative design.

- Recognition of the fact that collaboration is key. Partnerships between public and private actors, between sectors, and between islands. It was noted that this element of collaboration has been central in a private sector led follow up to the Willemstad conference.
The second step in collaboration with UN Environment was this conference. This conference would allow to develop a truly, regional view on SIDS approaches to waste management. It will also identify an action-oriented agenda, which may also serve as regional input at the UN Environment Assembly later in 2017.

**Patricia Aquing, Executive Director, Caribbean Water and Wastewater Association**

Ms. Aquing informed participants that waste Management is one of the key pillars of the Caribbean Waste and Waste Water Association (CWWA) and that CWWA is excited to lend support to progressing and implementing a Caribbean Waste Management Strategy.

Ms. Aquing also shared the following observations:

- By comparison, the waste sector is not as well coordinated as the Water Sector. There are a number of agencies/actors in the region and over time, a water fraternity has evolved to the point where there is the sharing of expertise and information, the conduct of joint activities and the pooling of resources, all of which leads to the optimum use of scarce resources. In the making (albeit for some time now), CARICOM and a number of partners have been working towards formalizing a Caribbean Water Consortium to address common issues in the sector. The CWWA would like to see something similar for the waste sector in the Caribbean. There is much to be gained by the regional waste management actors mobilizing to elevate the sector.

- Of interest also is that the CWWA and partners convene a high-level forum of Caribbean Ministers responsible for water and this year is the 13th iteration. The event serves as a platform for advocacy, for keeping our Ministers and development partners informed; to identify challenges and solutions facing the sector and to encourage coordination and cooperation within the sector. CWWA has received comment that a similar forum for ministers responsible for waste management would be highly valuable.

- In 2015, CARICOM gave the CWWA, specifically the Council for Trade and Economic Development (COTED) within which Sustainable Development and the Environment falls and which of course, includes our focus areas. This means that the CWWA speaks with a voice representing the professionals in the sectors. It also means that the CWWA has moved beyond the technical level to having a voice at the policy and political levels.
The CWWA held the 25th Silver Anniversary Conference and Exhibition in Trinidad last year, which was attended by over 400 participants. 63 exhibitors from all over the world came together to network, to view new technologies and products and to learn. The IDB and CWWA hosted a waste management meeting within the two days of the conference, which brought together key persons and agencies in waste management to start the development of a regional waste management strategy.

This year the CWWA meets in Guyana in from the 16th to 20 October and we are in discussions with the IDB once again about a follow up meeting. Consequently, the CWWA will continue to identify itself as a partner in the sector and we signal our willingness to work with others such as UN Environment as we advance this agenda.

Lt. Col. Oral Khan, Chief Technical Director, Ministry of Economic Growth & Job Creation, Jamaica

Lt. Col. Khan shared that waste and circular economy is a timely and urgent matter, especially for developing and fast growing nations. Many of these emerging markets have limited space for disposing waste, and waste is disposed in facilities that do not have proper technologies to protect human health and the environment.

A 2007 study demonstrated how socio-economic changes have influenced new quantities and types of waste. Specifically, there is more non-biodegradable and hazardous wastes. Unmanaged disposal facilities cannot process these more complex wastes, which creates the potential for fires and vectors. These conditions have created adverse health and environmental conditions, which are occurring at the Riverton Landfill.

Behaviors need to be changed, which is the goal of the Jamaica Plastics Project where the government has convened a working group to identify strategies that minimize the amount of packaging plastic that enters Jamaica. E-waste is another waste stream that is becoming problematic. A hazardous waste has been prepared, which the government should approve by end of this year.

Introductions and Conference Expectations

Participants introduced themselves and shared where they were from and whom they represented. Several shared their expectations for the conference, which are as follows:

- Emmanuel Dubois (Antigua & Barbuda): how as a region we can deal with specific waste streams such as tires.
- Thomasina Wilson (Bahamas), how to take back a landfill, private sector made a disaster, willing to learn from other participants dealing with private sector participation; share stories, learn common challenges and approaches
- Lumen Cayetano (Belize). Some infrastructure but pending challenges. Want to understand the best practices that other countries are using, and to learn from their experiences.
- Florian Mitchell (Dominica). Interest in recycling, tires as a challenge; lack of resources
- Andrea Jones (Jamaica). Exchange on policy development.
- Melissa Peterson (St. Maarten). Advice on raising awareness on the importance of proper waste management.
- Ronald Roach (Trinidad & Tobago) – A 25 year discussion on regional waste management has not translated into action. How do we make that happen?
- Patricia Aquing (CWWA). To better understand how CWWA can serve the region
- Dennis Reid (Jamaica Environmental Trust). To learn from various representatives, attitudes and approaches to SMW, and share own experience.

Conference Objectives and Historical Perspective

Vincent Sweeney, Head, Caribbean Sub-Regional Office, UN Environment

Mr. Sweeney provided an overview of the CWM Conference objectives:

- To build a waste action plan – a guide to best practice for Caribbean SIDS
- To network and share experiences
- To build on previous initiatives (e.g. Curacao, IDB, CWWA)
- To feed into global initiatives (e.g. UN Environmental Assembly (UNEA))

He also provided an overview of these activities and initiatives that led up to the CWM Conference:

- SAMOA Pathway for SIDS – reinforce waste management is an issue for SIDS
- Agenda 2030/SDGs (Sep 2015) – Jamaica hosted a conference
- Focus of UNEA (Dec 2017) – focus on pollution – opportunity through this conference to inform the discussions - possibility to have a side event
- Interest to improve collaboration in Dutch Caribbean (Curacao, Sep 2016) – one of the few opportunities to integrate the Dutch/English Caribbean
- CARICOM Strategic Plan 2015-2019 – environment as a key element – conference to inform the implementation of the Plan
- CWWA and IDB efforts (2016)
- National efforts in the Caribbean

Global and Regional Agenda - Agenda 2030/SAMOA Pathway/UNEA
Mr. Pon provided participants with an overview of the following global and regional solid waste agendas:

- 2012 - Rio+20 Outcome Document
- 2014 - SIDS - Samoa Pathway
- 2015 - Agenda 2030 for Sustainable Development
- 2016 - Forum of Ministers of Environment for Latin America and the Caribbean
- 2016 UN Environment Assembly-2
- 2017 UN Environment Assembly-3

He pointed out that waste management issues are already reflected in the global and regional agendas, thus providing a suitable framework to develop specific and tailored strategies on waste management in SIDS. He also informed that the third session of the UN Environment Assembly (Kenya, Nairobi, December 2017), will focus on the theme of pollution, which represents an opportunity for the Caribbean community to convey specific messages on needs and commitments on waste management.

**Waste Management in SIDS: a Growing and Cross Cutting Issues**

**Claudia Giacovelli, IETC**

**Waste Generation and GNI per capita**

There is strong correlation between per capita waste generation and the income level of a country.

Similarly, at a city-level, it can be seen that high-income cities tend to generate more MSW per capita as compared to those with lower incomes.

- Source: UNEP Global Waste Management Outlook 2015

Ms. Giacovelli spoke on the magnitude of the global waste stream and the urgent need for action to mitigate the potential environmental and health impacts of this trend. Specifically, that ten billion tons of garbage is generated annually, and the volume of this waste is the equivalent of circling the earth 24 times. Ms. Giacovelli shared that there is a strong correlation between per capita waste generation and the income level of a country. Thus, as
economies in SIDS improve, they need to be prepared to manage more waste and a different type of waste (i.e. plastics versus organics).

She also shared the importance of focusing on high priority wastes as the pose the greatest risk to the environment. These include:

- E-waste
- Marine litter and plastics
- Municipal solid waste
- Sewage
- Waste from the construction and demolition sector
- Hazardous waste

Finally, Ms. Giacovelli provided insight on opportunities for improving the global waste management situations as well as areas of activity of UN Environment/IETC on waste. These opportunities and activities include:

- Advancing Global Policy Making and Partnership
  - Support of national and city waste management strategies and action plans
  - Development of guidelines for policy framework development
  - Minamata Convention on mercury
  - Global mercury partnership
  - Global partnership on waste management
- Creating Knowledge and State-of-the-Art Science
  - Methodology for the “Sustainable Assessment of Technology (SAT)
  - Converting Plastic into a resource
  - Treatment and disposal of healthcare waste
  - Recycling used tires
  - Converting agricultural biomass waste into a resource
  - Recycling waste oils
- Capacity Development and Implementation
  - Waste minimization
  - Waste as a resource
  - Circular Economy
  - Region specific curriculum for Asia, Africa, Latin America and the Caribbean
Mr. Pon informed about the development of the Regional Outlook on Waste Management in the region of Latin America and the Caribbean, and presented some of the preliminary results and data available from the Caribbean countries. According to the information gathered to date, the total municipal solid waste (MSW) generation has been estimated in **13.7 million tons per year** (3.5 million tons/yr in the English/Dutch speaking Caribbean). However, many of the Caribbean SIDS generate small amounts of waste, frequently below 100,000 t/yr. The average per capita rate results in **1.3 Kg/cap/day**, which is also influenced by non-resident population (tourism). The per capita rate also shows a relation with the level of income of the different islands, as observed in other regions. Waste characterization data is rather scarce and sometimes not comparable, but average composition of waste is dominated by the **organic fraction (46%)**, followed by paper and cardboard (16%), and plastics (13%).

**Output of a IDB/CWWA Regional Workshop, October 2016**

**Evan Cayetano – WSA Sr. Specialist, WSA/CT**

Mr. Cayetano shared that the Inter-American Development Bank (IDB) was established in 1959 with the purpose of improving lives. Today, the IDB is the leading source of financing for economic, social and institutional development in Latin America countries. The IDB provides loans, grants, guarantees, policy advice and technical assistance to the public and private sectors of its borrowing countries.

Recent IDB interventions include:

- **Jamaica 2014** – GOJ/IDB Caribbean Conf. on SWM Solid Waste Management: A National Development Imperative
- **Barbados 2015** – KSP/IDB Capacity Building Workshop on conclusion of a joint consulting project between the Knowledge Sharing Programme (KSP) of the Export-Import Bank of Korea and the IDB:
Consultancy in the Determination of a Route Optimization Study for Waste Collection in Barbados

- **Trinidad 2016** – First and jointly-hosted (CWWA , IDB & CDB) Workshop on the Status of SWM in the Caribbean
- **EVAL 2015** – Regional Evaluation on Urban Solid Waste Management in Latin American Countries – 2010

Nearly all countries in the Caribbean face similar challenges related to solid waste management and the need to:

- Strengthen policy, legislative and institutional frameworks
- Establish suitable financing mechanisms
- Implement greater public education

A few Caribbean countries such as Belize and Barbados have made significant strides in improving their solid waste management issues. Participants who were primarily from public sector agencies understood the necessary approaches and strategies to improve solid waste management, but they were hindered by the lack of political will and the low priority that solid waste management held in the raft of government responsibilities.

We need to see waste as a resource. This would encourage more persons to look for opportunities to invest in waste management initiatives to produce useful products that could assist in contributing positively to countries’ gross domestic product. Many countries considering waste-to-energy (WTE) as an alternative energy source rather than waste management.

**Caribbean Waste Collective - Aruba, Bonaire & Curacao Leading the Way**

Diego Acevedo Van de Sant BV, private sector, innovative SME on recycling

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:

- A need to improve waste management and stimulate the transition to a Circular Economy was identified;
- Opportunities for broad economic development as well as self-sustainability;
- Economies of scale hinder progress; and,
- Stakeholders saw a need to collaborate.
The stakeholders share a vision that the waste recycling is a valuable asset 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 between 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.

Panel Session 1 - Mitigating and Adapting to Plastics

This session provided an opportunity for CWM Conference participants to learn about how other Caribbean Islands are developing strategies to minimize the amount of plastics entering the waste stream and optimize opportunities to recover plastics before they become litter or require landfill disposal.

Antigua & Barbuda – Plastic Bag Ban
Emmanuel Dubois, Landfill Manager, National Solid Waste Management Authority

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.

**Trinidad and Tobago Proposed Styrofoam Ban**
Ronald Roach, Chief Executive Officer of T&T Solid Waste Management Company

In early 1980’s the Government of Trinidad and Tobago ran a very effective public education campaign on anti-littering and proper waste management called “Chase Charlie Away”. However, the programme was suspended in 1986. Subsequently, government has invested heavily in collection and clean-up programmes and very little on public education.

In March 2017, the Government of Trinidad and Tobago announced that it is considering a ban on the importation, production and use of Styrofoam given the health and environmental challenges associated with this waste stream. There was an immediate reaction from the manufacturing sector, led by the Trinidad and Tobago Chamber of Industry and Commerce. Government has now convened the following committee to work on this issue:

- Ministry of Planning and Development
- Environmental Management Authority
- Ministry of Trade and Industry
- Water Resources Agency
- Manufacturers
- Institute of Marine Affairs

The committee is scheduled to make a recommendation in August 2017.

**Barbados Bottle Bill**
Shawn Phillips, Asst Manager, Engineering, EPD/SSA/PMCU

The Barbados Returnable Containers Act (BRCA) was passed on June 1st, 1986. Barbados originally introduced to minimize litter from the roadways of Barbados. Major bottling companies 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

** Redeemer
A person who demands the refund value, provided for the containers under the BRCA, for the empty beverage container.

** Dealers
Dealers can accept at their businesses from redeemers, any empty beverage containers, containing one gallon/ 3.8 litres or less. The dealer pays to the redeemer the refund value of each beverage container.

** Distributors
Distributors can accept from dealers any empty beverage containers of the design, shape, size, colour, composition and brand sold by the dealer and pay to the dealers the refund value of each beverage container.

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
- Minimize the negative environmental impacts of beverage containers
- Diverts valuable recyclable material form 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.
Trash Free Waters Program
Christopher Corbin, Communications and Pollution Programme Officer, UN Environment

Mr. Corbin provided an overview of UN resolutions and political commitments that could influence how SIDS and the Caribbean region manage waste. These include:

- Sustainable Cities, Consumption & Production
- Waste Management Outlooks and Guidelines
- Scientific Knowledge on Plastics and Micro Plastics
- Green, Blue & Circular Economies (*Cleaner Production, Waste as a Resource, Waste to Value, Resource Efficiency* etc.)

Mr. Corbin also shared that there is lots of global attention on oceans and a nexus between improper waste management and sustainable oceans is required to bring global attention to local waste management issues. CWM Conference participants need to be cognizant that we have been “talking” about improving waste management in the region for decades, with very little tangible action. However, some islands have made significant strides in plastics management, but plastic litter on one island adversely impacts them since waste travels.

Mr. Corbin informed CWM participants of a recent engagement to improve waste management in the region, specifically:

- Caribbean Regional Action Plan for Marine Litter (recently updated in collaboration with the Caribbean Youth Environment Network)
- Interactive On-Line Kids Game on Marine Litter
- Pilot projects in Barbados, Guyana, & Saint Lucia on Marine Litter & Integrated Solid Waste Management
- Supported ICC clean-up efforts in several Caribbean Countries
- Regional Lead Acid Battery & Used Oil Strategy: Basel Convention
- Global Environment Fund (GEF) Projects: *IWCAM & IWECO to improve solid waste management*
- Global Waste Management Guidelines, Waste Management Chapters in SIDS, *Global Waste Management Outlook*
- Regional Workshops: IDB, UN Environment, Caribbean Public Health Agency (CARPHA), CWWA, PAHO
- Caribbean Node for Marine Litter (under the GPA): *Microplastics in Fish; Links with incidence of Zika, Carnival in Trinidad*;
He also shared that UN Environment is building on these individual initiatives and creating partnerships, such as the Regional Marine Litter Action Plan. Finally, Mr. Corbin reflected that the following is required to create sustainable solid waste management systems throughout the Caribbean:

- Behavior change, integration and cooperation among multiple sectors
  - Exchange knowledge; experiences and best practices on marine litter and solid waste and plastics
- Improve infrastructure for managing solid waste (land & marine)
- Enhance PPPs to implement appropriate technological solutions & alternatives – products & packaging
- Encourage a shift towards a more circular economic model for solid waste and marine litter management: policies, laws, incentives

**Jamaica Plastic Project**

Andrea Jones-Bennett, MEGJC

Ms. Jones-Bennett spoke briefly on the Jamaica Plastics Project supported by UN Environment/IETC, since the Government of Jamaica would officially launch the initiative at the CWM Conference ceremony on July 5, 2017. Specifically, the focus of the initiative is to create an integrated system for properly managing plastic. Ministry of Economic Growth and Job Creation will establish this system through promulgating regulations rather than adopting bans. The Government of Jamaica feels that stakeholders would not support bans and the time spent on defending them would be detrimental to achieving the actual goal, which is to decrease littering from plastics. The Jamaica Plastic Project will include extensive public awareness and numerous, community-based initiatives.

**Plastic Mining Cooperation**

Daniel Poolen, Chief Plastic Officer

Mr. Poolen shared that The Plastic Mining Cooperation (PMC) is a start-up company that develops a tailor-made solution for plastic waste on islands and coastal areas. Cooperating with local environmental organizations and waste management companies, PMC makes it possible to turn waste into a resource, everywhere. By doing so, we contribute to stop the leakage of plastic waste into our oceans. This will stimulate and protect local economies that depend on a healthy marine ecosystem.

PMC is in partnership with Veolia, Kusters Engineering and Royal Dutch Kutcher Engineering. They are able to broker premium prices for plastics as they engage with off-
takers, such as Adidas and Dell, who see recycling plastics as a solution for multiple environmental and social problems. PMC is currently exploring potential partnerships with Caribbean Islands to service as a pilot programme.

Panel Session 2 - Fostering Financially Sustainable Waste Management Systems

Presenters during this session answered the following questions about the funding their waste management system:

- What are the household fee and tipping rate structures?
- How did you derive fee structures?
- What are your annual waste management budgets on a per capita basis?
- What percent of “fee” revenue pays for that?
- What are other revenue sources?
- How did you secure support for solid waste fees?
- Key learnings (what would you do different; repeat; how could other island nations replicate)?

Nevis – Monthly Household Fees and WTE
Shelagh James, Communications Officer, Ministry of Health, Nevis

Garbage Levy
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.

However, the levy system does face challenges including:

- Revenue amount collected is unpredictable, and fluctuates from month to month.
- Certain people always make it a practice to pay their monthly electricity bill, short by $10.00, which is less than the exact amount of the levy. The total builds up and eventually results in electrical disconnection but the process is very slow.
- Even though NSWMA pays the electric company a fixed month fee to collect the levy. It appears NEVLEC does not prioritize collecting the levy.
- The initial levy waste $5.00 per household per month. After roughly 16 years (2006), the NSWMA increased the levy to $10.00 per household per month. The levy increase create substantial public outcry.

8 All financials are EC$
In retrospect, a larger base amount than $5.00 NSWMA should have initially introduced a higher levy. Even after the increase in 2006, the average daily revenue for two collections per day, for each household with electrical meter, is only $0.33 cents. This system of revenue collection does not take into account the many households with no electrical meter, or the many public and national events where the NSWMA collects waste. A garbage collection levy of $ 30.00 per month would be more in keeping with the cost of operations in these times.

Waste-to-Energy

WTE is primarily a twofold process intended to provide waste management solutions, while simultaneously generating renewable electricity that is interconnected into the main circuitry of the resident utility company, for consumption by the populace. The utility company then pays the WTE owner/operator for the electricity introduced into the system, and the consumers pay the utility company.

Waste is processed at extremely high temperatures, with the absence of oxygen, (gasification, or pyrolysis) similar to the process which carbonizes wood to charcoal, without oxidation and production of ash. The gasification, or pyrolysis of domestic waste in a pressurized environment produces engineered fuel, also known as feedstock, which is a much improved version of refuse derived fuel (RDF), which is then used to fuel the boiling of water to produce steam, which then drives special turbines which produce electricity.

At this point, Nevis is actively pursuing a WTE system. However, NSWMA still needs to resolve numerous legal and financial considerations to begin developing the WTE plant.

Belize Landfill Tipping Fees

Lumen Melisa Cayetano, Senior Solid Waste Technician, Project Execution Unit

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 assess tipping fees based on the volume of material delivered. The transfer stations consolidate individual loads of garbage into larger vehicle 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; they 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 cause duplication of efforts, and policies/agendas that do not always align.

Panel Session 3 - Governing Transformation

Presenters in this session discusses how strategies, policies and operating structures impact waste management on a national and regional level

Bahamas – Public-Private-Partnerships
Thomasina Wilson, Senior Deputy Director, Department of Environmental Health

Ms. Wilson shared the history of privatizing operations of the New Providence Landfill. The government made the decision to privatize landfill operations after receiving numerous unsolicited proposals for WTE. The prime minister assembled a national energy task force to evaluate viability of WTE. The task force determined that WTE was not appropriate for the Bahamas. Rather, they recommended that the Bahamas should increase recycling and remediate the New Providence Landfill. The government awarded a contract the Renew Bahama to construct and operate a material recovery facility (MRF), as well las manage and remediate the New Providence Landfill.

Renew Bahama was awarded its contract without the government putting out a public tender via a specially designed request for proposal (RFP), a fact that drew criticism at the time the contract was awarded. Renew Bahama is a recycling company and did construct the MRF, one of the first in the region. However, they were not experienced with landfill management or remediation.

A fire consumed the MRF several a few years ago, and they could not generate revenue from recycling and could not fiscally sustain themselves. Eventually, Renew Bahama pulled out of the contract and left the Government with an open dump. Renew Bahama would not permit government officials on site to inspect the landfill. Before, Renew Bahamas managed the site, the New Providence Landfill was an IDB-funded sanitary landfill. In 2017, a massive fire occurred at the landfill and the Bahamian government incurred to manage it.

Key lesson: Due Diligence is essential when privatizing solid waste operations.

Saint Lucia – National Waste Management Strategy and Waste Collection Contracts
Laurianus Lesfloris , Deputy General Manager, St. Lucia Solid Waste Management Authority

Mr. Lesfloris provided an overview of the Saint Lucia solid waste management system, which includes a used oil management programme, a biomedical waste treatment programme, and ship waste management. The Saint Lucia Solid Waste Management Authority (SLSWMA) instituted a number of public information and awareness initiatives featuring a mascot named Tin Tin in order to raise awareness to a number of issues
affecting the environment. Tin Tin represents good waste management practices and preaches the message of the “3 R”s. Among the undertaken to date are clean-up campaigns of beaches, highways, schools, parks, etc., Antilitter marches in communities, tours of landfills, production of public service announcements, quarterly newsletter, creation of a website, radio and TV talk shows, workshops for children, community meetings.

As with many island nations, Saint Lucia experiences widespread indiscriminate disposal of waste in rivers, streams, drains, and in the sea. This resulted in accumulation of waste especially plastic bottles in bays, harbors and on the island’s beaches. Additionally, the Authority does not receive sufficient funding to manage the landfills or contract with private waste collectors.

The SLSWMA is currently preparing national waste strategy, which UNEP funding. The strategy planning process includes the following action items:

1. Assess available reports/data to establish baseline
2. Quantify waste streams and composition
3. Forecast future waste quantities
4. Engaging civil society in identifying strengths, weaknesses and challenges
5. Conduct workshops, identify issues, formulate/prioritize goals and design strategies
6. Develop action plan: technical, regulatory and financial considerations to achieve goals and targets

To date, the SLSWMA has completed action items one through five.

Jamaica – Open Dumping and Ship Waste
Bertrand Smith, Director of Legal Affairs, Maritime Authority of Jamaica

Mr. Smith shared that the Maritime Authority of Jamaica is a statutory corporation that is responsible for the regulation and development of shipping in Jamaica. Ships present multiple environmental liabilities including:

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

The International Maritime Organization has established the following protocols and conventions to mitigate pollution from ships:

- London Protocol – dumping of waste at sea
- Land based options must be exhausted before disposal at sea
- Ballast Water Management Convention

Mr. Smith highlighted Annex V of the MARPOL Convention that establishes the criteria for how ship operators and coastal state to manage ship garbage. Specifically, ships required to retain on board wastes that MARPOL prohibits from being discharged 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.

Some coastal states do not have facilities that can adequately manage certain ship garbage, such as hazardous waste. Amendments to MARPOL Annex V enable SIDS to satisfy the relevant requirements of reception facilities through regional arrangements.

S I D S  W a s t e  M a n a g e m e n t  O u t l o o k
Jeff Seadon, IETC Consultant

Mr. Seadon shared his background and information on the geography, economics, demographics and waste management in his island nation – New Zealand. Mr. Seadon also described the SIDS Waste Management Outlook that he is helping UN Environment prepare for regions throughout the world.

UN Environment is designing the SIDS Waste Management Outlook to capture the existing waste management systems of SIDS regions throughout the world.

To assure Caribbean SIDS Waste Management Outlook provides the greatest value to Caribbean solid waste professionals and systems, Mr. Seadon asked the following question of CWM Conference participants:

“What outputs would make this document useful for your country?”

The CWM Conference then broke out participants in to six groups. Attachment B categorizes their collective response to this question by subject area.

Mr. Seadon then shared what the initial thoughts were on the Caribbean SIDS Waste Management Outlook contents:

• Introduction
• Waste Management – context, where are we now?
  1. State of waste management in SIDS
  2. Major trends of generation & management
  3. Pathways of waste to marine environment
4. Waste management: a cross cutting issue

- Priority wastes and Issues
  1. High priority waste streams
  2. Issues
  3. Integrating with issues at different scales
  4. Special circumstances:
  5. Natural disasters
  6. Waste management crises

- Governance
  1. Regional and sub-regional policy initiatives
  2. Implementation of policy initiatives
  3. Policy and legislation in SIDS
  4. Effectiveness of legislative frameworks
  5. Barriers and challenges
  6. Strategies to Overcome Barriers

- Financing
  1. Financing initiatives
  2. Market based instruments
  3. Public-private partnerships
  4. Cost of inaction

- Stakeholders Roles and Engagement
  1. Stakeholder involvement
  2. Awareness Raising & Education initiatives

- Action Plan
  1. Regional Initiatives
  2. Sub-Regional Initiatives
  3. Country Initiatives

- Conclusion

However, Mr. Seadon said he will modify this outline to reflect what the CWM Conference participants identified as what the Caribbean SIDS Waste Management Outlook should address.

Mr. Seadon then reconvened the CWM Conference participants into work groups to answer the following questions:

- What are the best data sources?
- How do we get reliable data?
- Where to find case studies: solid, liquid & gas?
- Who could serve as a contact for follow up questions?
- Who would be interested in reviewing the draft Caribbean SIDS Waste Management Outlook?
- How do we ensure dissemination of the Caribbean SIDS Waste Management Outlook?
• How do we ensure uptake of the *Caribbean SIDS Waste Management Outlook* recommendations?

*Attachment C* provides responses to these questions.

**360 Recycling Field Trip**

Caribbean Waste Management Conference, participants visited the 360Recycle Manufacturing Ltd; a recycling plant and waste-to-wealth company in the suburbs of Kingston which seeks to add value to items thrown away. The company uses recyclable or biodegradable materials such as plastic bottles, newspapers, Styrofoam containers and cardboards to create featured artwork and environmentally-friendly products.

During a tour of the plant facilitated by owner and Managing Director, Scheed Cole showed participants the process of recycling the materials and molding them into various products, which include flowerpots, playground elements, particleboard, curb walls, blocks, and even plastic bottle housing facilities using a combination of plastic bottles, shredded cardboards, newspapers and Styrofoam. Mr. Cole is a trained visual art educator described the process of creating the products, and how they use a repurposed machine to blend materials such as the cardboard and newspaper down to pulp. 360Recycle removes the excess water from materials and grates the material into pebble. 360Recycle dries and measures the material to create the mixture for the product. Upon creating the mixture for each product, the 360Recycle pours the material into a mold. 360Recycles paints the final product after it dries.

Mr. Cole also employs the upcycling process, where he uses materials in their current form (i.e. plastic bottles) to create most of his playground equipment. Prices for his products range from $2,000 JMD for the flowerpots to $180,000 JMD for a lion sculpture.

360Recycle looks to expand operations and is calling on government, the private sector and civil society to partner with the company. CWM Conference participants were very impressed with the level of detail of the artwork and what 360Recycle is doing for the environment and the people in the community.

**Global Partnership on Marine Litter – Outreach and Education**

Heidi Savelli, UN Environment, GPA
Ms. Savelli shared several global initiatives that UN Environment is spearheading to reduce marine litter. First, she summarized the key recommendations from *Marine Plastic Debris and Micro Plastics Study*:

- Phase out of micro plastics in personal care and cosmetic products
- Drastic reduction/ban of single-use plastics
- Short-term: waste management, long-term: upstream reduction
- ‘Biodegradable’ will not decrease marine litter. There needs to be an internationally agreed definition of biodegradability in a marine environment.
- Harmonization and standardization of monitoring methods
- Gaps/solutions for governance frameworks

Ms. Savelli also provided an overview of the Massive Open Online Course (MOOC) on marine litter. The Leadership Track consists of 8 hours of learning, divided into two blocks. The Expert Track adds on 32 hours of learning, divided into six blocks.

The Leadership Track is available in English, Spanish, French, Portuguese, Chinese, Russian and Arabic. The Expert Track is available in English and Spanish. So far, 6,500 students have registered from 54 countries.

Another UN Environment initiative is the *Clean Seas Campaign Turn the Tide on Plastics*. The objective of this campaign is to:

- Improve plastics management (redesign, reduce)
- Global phase out non-recoverable plastics (e.g. microplastics in cosmetics)
- Reduce single-use plastics drastically
- Move towards: plastics consumed re-enter the product life cycle, i.e. generate zero waste, all plastics recyclable

Finally, Ms. Savelli provided an overview of upcoming UN Environment activities:

- Assessment for UNEA-3, Advisory Group,
  - Existing frameworks and strategies
  - Gaps and options
- Toolkit for addressing problematic plastic polymers / products
Baseline setting – countries and approaches

- Communications package
- Demonstration/pilot projects
- Plastics management strategy SIDS
- Stock-taking and technical support Marine Litter Action Plans including the Wider Caribbean Region
- Fiberglass vessel disposal, alternative materials studies

**Activities of the Basel Convention Regional Centre for Training and Technology Transfer for the Caribbean**

Ahmad Khan, Director, Basel Caribbean Centre

Mr. Khan provided an overview of the following multilateral environmental agreements in waste and chemicals management:

- London Convention
- MARPOL Convention
- Vienna Convention and the Montreal Protocol
- Basel Convention
- Rotterdam Convention
- Stockholm Convention
- Strategic approach to international chemicals management
- Minamata Convention
- UNFCC/Kyoto Protocol/Durban Platform/Paris Agreement

He also shared the history of the Basel Convention Regional Centre (BCRC) in the Caribbean and the countries they serve:

- A Framework Agreement was signed at 7th COP in 2004, to establish the BCRC-Caribbean with Trinidad and Tobago as the host county
- In April 2008, the BCRC became an autonomous regional, corporate body under the Act Number 2 of 2008 enacted by Government of the Republic of Trinidad and Tobago enacted.
- Currently hosted by the Ministry of Planning and Development
- In April 2016, a Project Management Unit was established consisting of a Head and three Project Assistants
- Serves 14 Caribbean parties

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<tr>
<th>Countries consenting to be served by the BCRC-Caribbean</th>
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<tr>
<td>Antigua and Barbuda</td>
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<td>Barbados</td>
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<td>The Republic of Cuba</td>
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• Core functions:
  o Training
  o Technology transfer
  o Education and awareness
  o Information exchange – clearing house mechanism
  o Consulting

• How BCRC works:
  o Through political focal points and competent authorities
  o Develop regional strategies in consultation with steering committee on an annual basis
  o Develop project proposal and source funding for execution in member countries.

• Overarching principle of operation is to build sustainable capacity for the management of wastes and chemicals in an environmentally sustainable manner

Best available technologies/practices

The BCRC has made multiple and significant accomplishments in the management of special wastes within the region these include:

• Inventorying the generation and stockpiling of waste pneumatic tyres resulting in the development of recommendations and a regional strategy to support the environmentally sound management of waste tires in the Caribbean.

• Report on the waste electric and electronic equipment (WEEE) waste stream in Suriname and Trinidad & Tobago to assess relevant local stakeholders involved in WEEE generation and management and highlight current management practices.

• Updated National Chemicals Profiles for Belize, Saint Vincent and the Grenadines and Trinidad and Tobago

• Conducted national inventories of mercury releases in Jamaica, Suriname and Trinidad & Tobago.

**Caribbean Development Bank**

Karl Pivott, Operations Officer, Civil Engineer

Mr. Pivott shared an overview of the grant funding the CDB provides for technical assistance, which is often the precursor for an island nation to receive a project development loan. Approving a loan request often requires feasibility studies (grants available), and CDB decides after feasibility study. When the feasibility timeframe is considered, could take several years to receive a loan.

The CDB takes a holistic approach to approving solid waste grants/loans. CDB does not just provide money to just one part of the system (i.e. landfill) if supporting infrastructure will not work.
Caribbean Regional Waste Strategy – Opportunities and Issues
Karen M. Luken, UN Environment Programme Consultant

Ms. Luken started this session by explaining the difference between the Caribbean SIDS Waste Management Outlook and the Caribbean Regional Waste Strategy and the nexus between the two initiatives. Ms. Luken then identified the issues and opportunities for waste management in the Caribbean based on the information presented by CWM Conference participants, as well as from previous, regional solid waste studies and conferences.

Ms. Luken consolidated these opportunities and issues into five categories:

- Communication
- Infrastructure
- Circular Economy
- Financial
- Policy/Planning

Communication Opportunities

- CWWA – Potential partnership with CWWA will provide an opportunity to present the importance of solid waste management and the need to improve current conditions to high-level decision-makers, the investment community and CARICOM.

- Antigua & Barbuda – Retailers in this nation support the ban on plastics bags and can testify to retailers in other nations that is did not affect sales or customer satisfaction.

- Chasing Charlie – Chasing Charlie was an effective campaign and the logo was both recognizable and memorable. There was discussion about resurrecting Chasing Charlie converting it into a regional campaign.

- Belize – Belize officials recognized the nexus between investing in a sustainable solid waste management system and a thriving tourist-based economy. This message can be shared with other high-level officials throughout the region.

Communication Challenges

- Institutional knowledge - Multiple NGOs, 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 awarded. However, a database exists that catalogues all of this
info and assesses the effects of the research and funding on improving waste management in the region. Thus, the value of changing waste system is difficult to communicate to decision makers.

- **Relevance** – Regional infrastructure issues, such as the need for renewable energy and waste quality, receive much more attention and discussion than waste management. This may be due to all people are effected by high electricity bills and drink water. However, most people directly harmed by mismanaged landfills are typically not wealth or powerful.

- **Limited voice** – Highly knowledgeable and committed professions operated solid waste authorities. However, key financial or operating decisions are frequently made without their perspective. Additionally, many of the companies distributing unsolicited proposals for advanced technologies go directly to ministries’ of investment or economic development, and solid waste authority managers do not have an opportunity to vet them before legal documents are executed.

- **Environment/economic nexus** – Examples do exist where government officials understand the relationship between sustainable solid waste management and a vibrant economy. However, it is still the exception not the rule in the region. Especially, if addition funding is required to improve waste management systems.

**Infrastructure Opportunities**

- **Sanitary landfills** – Certain islands such as Belize, Barbados and Saint Lucia, are operating landfills with liners and leachate management systems, and they use regular cover to prevent odors and fires. Some of these facilities charge tipping fees to commercial customers to generate revenue to operate and maintain these facilities.

- **Belize transfer stations** – Transfer stations can significantly reduce waste collection costs and serve as an outlet for residents and business to deliver recyclables and special waste. Belize has successfully incorporated the use of this type of facility in their integrated waste management system.

- **Automated, weekly 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.

- **Compost facilities** – Several islands, such as Grenada, are developing facilities to professionally, compost green wastes. Prior to constructing these facilities, these islands are 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.

**Infrastructure Issues**

- **Unmanaged landfills** - Significant amounts of waste not managed at sanitary landfills. According to a 2010 IDB study, on 54% of waste in the Caribbean is managed at a sanitary landfill.

- **Capacity** – Most of the sanitary landfills in the region were built during the 90s or during the first couple of years of the 21st century. The lifespan of a sanitary landfill is typically 20 years, which means most of the facilities in the region are close to reaching capacity. A new landfill typically requires 5 years to find a location, conduct hydro-geological studies, secure financing, prepare engineering designs and construct the facility.

- **Ship waste (MARPOL)** – During the presentation made on July 4th by Bertrand Smith Director of Legal Affairs, Maritime Authority of Jamaica, island national that signed the MARPOL Convention may be required to manage all types of ship waste, not just garbage. Most island nations do not have the infrastructure to manage many of these materials.

- **Funding** - The CWM Conference participants are in consensus that sufficient funds are not available to operate and maintain solid waste collection and disposal facilities. This insufficient funding is systematically decreasing the collection and disposal performance, and equipment now requires major repairs or replacement because operators delayed or forewent routine maintenance.

**Circular Economy Opportunities**

That past two days revealed numerous recycling activities in islands that have the potential to be replicated through the region.

- **Barbados plastic bottle redemption** – Plastic bottle littering is epidemic throughout the region. Tourists will prefer bottled water to tap regardless of water quality. The BRCA serves as a model that a plastic bottle redemption programme is possible in an island nation. Barbados is currently evaluating the BRCA and will be amending the currently legislation to address issues and make it more effective.

- **Caribbean Waste Collective** – Lack of sufficient material to ship to brokers/processors is a barrier to recycling in the region. The CWC has successfully facilitated individual islands, as well as public and private entities, to combine
resources to increase the volumes of recyclables collected to optimize market potential.

- **Antigua & Barbuda, Aruba, Dominica and Trinidad plastic ban initiatives** - Retailers are skeptical about bans on plastic bags, and frequently block any initiatives that restrict how they contain their merchandise for customers. Antigua & Barbuda, Aruba and Dominica have successfully secured the support of a plastic bag ban amongst retailers, and Trinidad is actively engaging them in a dialogue on how a ban could work there.

- **Saint Lucia used oil** - Countries in the region constantly receive unsolicited proposals for WTE technologies that can convert all of their waste to electricity, eliminate the need for landfills and require no financial investment from the government. However, no facilities have been constructed and successfully commissioned. As part of the national waste strategy, Saint Lucia inventoried all recycling activities. This exercise revealed that private recyclers are recovering significant amounts of used food oil and grease (FOG) and selling it to local industry for boiler fuel.

**Circular Economy Issues**

Island nations also need to address issues to facilitate a Circular Economy within the region.

- **Regional trade policies** – While CWM Conference participants all agree that one island nation cannot ship garbage to another island for disposal, there are differing perspectives on whether inter-island transportation of recyclables, compostables and waste feedstock for WTE is legal. Recycling, composting and WTE has a greater chance to succeed if the region can achieve economies of scale. Caribbean islands can only achieve economy of scale if an island constructs a facility that serves multiple islands.

- **Recycling not clearly defined** – Private recyclers are collecting material. However, they often stockpile it for weeks, months and sometimes years to accumulate enough material to ship or to secure the highest possible price. In addition, some private companies start a recycling business with the best intentions, but cannot make it succeed. When this occurs, the government is responsible for remediating the site. Consequently, governments need to define “recycling” and the definitions ideally be consistent throughout the region.

- **Lack of local markets** – Local markets for recyclables such as glass, paper and plastics are limited on island nations and the international markets are volatile and becoming more restrictive.

- **Landfills not used as resource** – If properly designed, island nations can use landfills as a resource to generate electricity while operating and serve as a solar farm when
they reach capacity. However, this requires additional capital funding and it is challenging to convince government officials to invest in waste management.

Financial Opportunities

- **Monthly user fees** – Islands such as Grenada and Nevis have established a mechanism where solid waste management is treated like a utility where customers pay a monthly fee for service.

- **Facility tipping fees** – Islands such as Belize, Aruba and Barbados are charging commercial customers fees to use transfer stations and landfills. The hotel industry in Saint Lucia and Grenada are receptive to the concept.

- **Tax incentives** - The government also provided tax incentives to make alternatives to Styrofoam cost equivalent.

- **Environmental levies** – Numerous islands in the region of both a value added tax (VAT) and assess an environmental levy on products entering the country.

Financial Issues

- **Fee payment** – As Nevis discussed, monthly user fees are not fully recovered. Some residents only pay the electricity portion of their utility bill. Utility companies do not see the value in turning off electricity if customers forgo paying solid waste fees.

- **Open dumping** – If tipping fees are set too high, it can create open dumping of waste. Thus, solid waste facilities may not ever be able to fully recover costs exclusively through tipping fee revenue. For the tipping fee structure to work, the government needs to promulgate and enforce open dumping regulations. However, many legal systems do not consider open dumping a priority.

- **Environmental levy disbursements** - Multiple CWM Conference participants stated that their island assesses an environmental levy on products that require final management by the solid waste authority. However, revenues from these fees go to the central government, who in turn allocates a percent of the revenue to the waste authority or other environmental departments. In some instances, waste authorities are receive less than 50% of the environmental levy revenue.

Policy/Planning Opportunities

- **Laws** - Most islands have littering/open dumping laws

- **Studies** - Regional studies and local planning being conducted

- **SWANA** – The Solid Waste Association of North America (SWANA) has a Caribbean Chapter and is keenly interesting in supporting the region.
• **Marine Litter** – UN Environment has prepared *Regional Action Plan on Marine Litter in the Caribbean*

**Policy/Planning Issues**

• **Enforcement** - Few littering/open dumping laws fully enforced. Aruba uses city inspector to enforce litter/open dumping regulations, which has decreased the occurrence of these activities. Jamaica shared that judges have scrutinized the penalty fees as being too high even though they are from the solid waste law.

• **Expectations** - People transform waste systems rather than paper. Numerous reports and study are produced, but they are usually developed with limited consensus building amongst key stakeholder. Thus, recommendation and strategies are not implemented.

• **Definitions** - Lack of standardized definitions.

Ms. Luken asked participants if she omitted any opportunities or issues. Responses are below:

• **Trinidad & Tobago** - Evaluation of tenders is too price based; qualifications are not adequately considered. Guadeloupe best system in the Caribbean; to take all managers to Guadeloupe to learn about the experience; share technical expertise with other Caribbean countries [engage Agence Française de Développement (AFD)]

• **St Lucia**: With respect to Guadeloupe, we do need to be cognizant that European Union legislation governs them, and they have significant funding. St Lucia could do a lot with similar funding levels. Convincing our Cabinet that waste management is important and deserves adequate funding has been challenging.

• **Antigua**: We have a recycling relationship with Guadeloupe. Previous conferences and studies identified many these recommendations discussed this week. Some are 20 years old!

• **IDB**: Public health was the main driver for waste management services, but now performs like a utility but not funded like a utility.

• **CWWA**: to grow SWM as pillar of their portfolio; currently includes wastewater but not solid wastes. There is a wealth of information in the region. They could release newsletter, but they will need contents. Asks for contributions to feed into the newsletter.

**Strategy Work Groups**

Ms. Luken then asked the CWM Conference participants to break into work groups that aligned with the five issue/opportunity categories. Ms. Luken asked each work group to respond to the following questions.
Communication Work Group

Regional Scale
The communication work group recommended that a regional communication strategy be developed and that all islands use the same messaging for issues such as anti-littering. The first step in developing a regional communication strategy is to determine target audiences and design messages that resonate with them (i.e. teenage boys and homemakers have different motivators). To make waste management “relevant” we need to promote all of the efforts that Caribbean islands are making through high visibility figures, such as local musicians and fully utilize social media. We should also strategically partner with corporate organizations and private communication sectors (FLOW and DIGICEL) and different organizations, e.g. CWWA. We also need to leverage crisis, such as landfill fires, to highlight the need for proactive solid waste management.

There are many examples of successful and unsuccessful initiatives - to collaborate with organizations to document case studies and the cost of inaction.

Barriers
Regional campaign may not work because of country-specific culture and circumstances. Thus, we need to identify the issues and campaigns that could be universal. In addition, we will be competing against more relatable, environmental issues, such as saving dolphins.

Champions
- Respected public figures (i.e. entertainers/sports figures)
- Retailers and manufacturers

Responsible for Implementation
- UN Environment

Timeline

Should strategy or programme be addressed/implemented at the regional or local level?
- If regional, how would it be scaled?
- What would be the barriers?

Who would be a champion?
- How would it be implemented and who would be responsible?
- Timeline (years)?
• Strategy Development: 2 years
• Strategy Implementation: 5 to 10 years

Questions/Comments
• Trinidad and Tobago - Immediate actions needed. We should create a Facebook group after the meeting to share information
• CWWA: A newsletter is available for waste management, but countries need to contribute content
• BCRC – recalls their website

Infrastructure Work Group

Regional Scale
Opportunities exist for regional scale-up for certain special wastes such as tires. For example, governments could work together to transport a mobile shredder units throughout the Caribbean. However, regional cooperation will require a concept feasibility and business plan. Countries that already have recycling programmes for specific materials could be a focal point for the region and expanded upon. For example, Saint Lucia could serve as a central hub to consolidate used oil. Certain solid waste activities should remain at the local level, such as landfills and pre-processing of recyclables. However, minimum operating and design standards need to be aligned throughout the region.

Barriers
• Shipping costs
• Legislation/regulations (i.e. importation of waste prohibited)
• Multilateral agreements, conventions, treaties: may be a barrier to transboundary movement
• Geographic location (remoteness)
• Volumes too small

Champions
• Government national island
• Advocacy groups
• Departments, agencies with responsibility
• Churches
• Media
• UN as result of MEAs
• Cabinet: policy level
Department: project execution units

**Responsible for Implementation**
Policy would be at the cabinet level and then, departments and project implementation units would oversee implementation along with community-based organizations. BCRC: the Basel Convention governs the movement of hazardous waste.

**Circular Economy Work Group**

**Regional**
Yes, scaling recycling programmes at the regional level is possible. However, modifications may be necessary based on the different cultures that exist regionally. Recycling regulations may be required in some countries and these can act as a disincentive to develop recycling facilities and collection systems. Regional pilot projects can be used to collect feedback to determine if recycling programmes are sustainability. Additionally, Sustainable Development Goals (SDGs) and other global agreements need to align.

**Barriers**
Lack of:
- Information/data in some countries
- Sustainable funding
- Infrastructure and technology
- Political support
- Desire to change (throw away society)

**Champions**
- NGOs
- Media
- Regional associations
- Government
- Professional organizations
- Private sector
- International organizations like UN, IDBs

**Responsible for Implementation**
- CARICOM has a role – relevant sector sub-committees
- Council of environmental ministries
- IDB through regional/county programmes
- Relevant government ministries

**Timeline**
- Adjusting regional trade policies to facilitate the movement of materials and recycled products between islands: 3-5 years
- Integrate circular economy concepts in the policy framework, Harmonization of national policies and legislation with regional policies: 2 years
- Development of an expansive public education and awareness campaign: 1 year
- Pollution prevention programme: 2 years
• Incentive schemes and capacity building: 2 years
• Local/regional market surveys, promotion (investment/business forums), investment briefs: 3 years

**Financial Work Group**

**Regional Scale**
We should assess the current situation of financial situations (costs, budgets, revenue sources) to provide a benchmark (resources from IDB / CDB to undertake this)
This will facilitate designing the cost recovery schemes

Extended Producer Responsibility (EPR) could be a potential mechanism to reduce the financial burden on local governments funding final management of products such as electronics. However, EPR would need to be implemented at a regional level and maybe, international level. Governments should treat waste management as a utility where you pay for what you use.

**Issues/challenges**
• Residents pay electricity part of bill, but not solid waste. Solid waste fee recovery rate less than 20%.

**Questions/comments**
• **Aruba**: experience in treating waste as an utility
• **St Vincent**: CWWA as the driving force in the region
• **Trinidad and Tobago**: Should also consider tipping fees as a way to incentivize recycling
• **IDB**: to prevent providing the service at the lower cost option
• **Karen**: Are any islands charging an environmental levy and a VAT? Bahamas, Belize Barbados, Belize Antigua, Jamaica Trinidad and Tobago.
• **Antigua**: waste collection is not a simple utility; the lack of management affects others (health & environment)

**Policy / Planning Working Group**

**Issue – Littering and Open Dumping**
The Policy and Planning work group recommended that CARICOM should take the lead in developing a regional policy framework – but each individual state should have their anti-litter and dumping laws. Buy-in by CARICOM, CARICOM Secretariat and local governments/ministers is required, but challenging.

Additionally, any strategy needs to consider enforcement capacity. Litter enforcement not a priority for police or courts. Also the Caribbean culture is a factor as littering is a way of life” evening anti-littering education is occurring in the schools and clean-up campaign are highly publicized. Finally, both enforcement and education will require funding. What is the source?
Champions:

- CARICOM
- Citizens
- Local government
- Private sector
- Environmental organizations

Responsibility:

- Ministers
- NGOs

Timeline:

- 10 years

Issue – Role of Boards in managing solid waste authorities

CARICOM should establish a forum of high-level regional ministers who are responsible for waste. On the local level all board member who administer solid waste authorities should have an environmental background. Should be champions for waste authority and looks for ways to help implement waste strategies.

Questions:

- **St Eustatius**: how to include Dutch/French in CARICOM events? Response: ABC Islands also included
- **Trinidad & Tobago**: we need an entity more accessible than CARICOM in the short term
- **IDB**: how realistic? Response: CARICOM provides policy framework; not the laws
- **BCRC**: caution about national jurisdictions; forum of ministers: COTED already exists- we need to influence them
- **Vincent**: caution about CARICOM Secretariat and CARICOM as member states. To be careful about the CARICOM Secretariat limitations. There are many ways to influence the agenda of CARICOM meetings. We can work on the recommendations, but we do not need to forget about the means necessary.
- **Patricia**: High-level forum would be dedicated to waste; otherwise waste management will get lost by other priorities, e.g. climate change.

Summary Policy:

CARICOM and ABC should collaborate on a policy framework with guiding principles on waste / high level forum ministers- which can be channeled through COTED; the meeting to provide recommendations, but careful with the means of implementation. CWWA would be the driving force. To develop a strategic document / action plan / call for action – to be promoted, used at different settings (CARICOM/COTED meetings/agenda; UNEA...)

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**Closing Remarks**  
*Vincent Sweeney, Head, Caribbean Sub-Regional Office, UN Environment*

Mr. Sweeney thanked all of the CWM Conference participants for their active engagement and thoughtful contributions during the last three days. Mr. Sweeney shared the next steps and milestones:

- Completing the *Caribbean SIDS Waste Management Outlook.*
- CWWA conference, October
- CARICOM Secretariat-UN consultation in 2 weeks
- UNEA, December 2017 – the outcome of this conference feeding into it – and the Caribbean region is leading, not only in SIDS but globally (side event at UNEA)

These opportunities will help shape the regional waste strategy.
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<td>Antigua &amp; Barbuda</td>
<td>Emmanuel Dubois</td>
<td>Landfill Manager, National Solid Waste Management Authority</td>
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<td>Aruba</td>
<td>Michael Raymond</td>
<td>Manager, Serlimar</td>
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<td>Bahamas</td>
<td>Thomasina Wilson</td>
<td>Senior Deputy Director, Department of Environmental Health</td>
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<td>Barbados</td>
<td>Shawn Phillips</td>
<td>Asst Manager, Engineering, EPD/SSA/PMCU</td>
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<td>Barbados</td>
<td>Karl Pivott</td>
<td>Operations Officer, Civil Engineer, Caribbean Development Bank</td>
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<td>Belize</td>
<td>Lumen Melisa Cayetano</td>
<td>Senior Solid Waste Technician, Project Execution Unit</td>
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<td>Brazil</td>
<td>Felipe Colturato</td>
<td>Director, Methanaum Waste and Energy</td>
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<td>Curacao</td>
<td>Diego Acevedo</td>
<td>Van de Sant BV, private sector, innovative SME on recycling</td>
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<td>Dominica</td>
<td>Florian Mitchell</td>
<td>General Manager, Dominica Solid Waste Management</td>
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<td>Dutch Caribbean</td>
<td>Daniel Poolen</td>
<td>Chief Plastic Officer, Plastic Mining Cooperation</td>
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<td>Patricia Zitman</td>
<td>Founder, Plastic Mining Cooperation</td>
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<td>Nilza Smith</td>
<td>Dean, Faculty of Engineering and Computing, University of Technology, Jamaica</td>
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<td>Jamaica</td>
<td>Shelly-Ann Dunkley</td>
<td>Environmental Communication Officer, Wisynco Group Ltd</td>
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<td>Vincent Sweeney</td>
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<td>Ministry of Economic Growth &amp; Job Creation (MEGJC)</td>
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<td>Environmental Officer, NEPA</td>
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<td>National PAHO Consultant, Pan American Health Organisation</td>
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<td>Nadia-Deen Ferguson</td>
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<td>Michelle Salvin</td>
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<td>Jamaica</td>
<td>Noel Whyte</td>
<td>Caribbean Water and Wastewater Association</td>
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<td>Gerald Lee</td>
<td>Chief Executive Officer, St James Municipal Cooperation</td>
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<td>Nikala Thompson</td>
<td>Director of Planning, Clarendon Municipal Cooperation</td>
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<td>Elecia Myers</td>
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<td>Jamaica</td>
<td>Lavern Salmon</td>
<td>Executive Director, Recycling Partners of Jamaica</td>
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<td>Jamaica</td>
<td>Tarah Bryan</td>
<td>Public Relations Officer, Recycling Partners of Jamaica</td>
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<td>Jamaica</td>
<td>Gail Nelson</td>
<td>Science, Technology and Innovation Planner, Planning Institute of Jamaica</td>
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<td>Jamaica</td>
<td>Larytha Fletcher</td>
<td>Urban and Regional Planner, Planning Institute of Jamaica</td>
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<td>Jamaica</td>
<td>Mr Audley Gordon</td>
<td>Executive Director, National Solid Waste Management Authority</td>
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</tbody>
</table>
Governance

- SDGs status compliance in the region
- Multilateral and bilateral environmental agreements status compliance
- Existing legislation and policy review
- Supporting legislation and policies for gaps identified
- Recommendations for legislation
  - Institutional frameworks
  - Regulation and enforcement
  - Broad structure
- Institutionalised high level political and policy focus
- Enabling environment
  - Legislative review
  - Rules & regulations
  - Institutional arrangements
  - Enforcement mechanisms
  - Monitoring
  - Technical cooperation

Data

- Country specific characterisation information
- Hazardous waste inventory and management
- Data collection systems
  - Consistency
  - Methodology/accuracy
  - Institutionalised
  - Format
  - Data sharing
- Empirical data gathering
- Data compilation
  - Quantity and quality
  - Tonnage
  - Cost per ton
- Standardisation
- Snapshot of waste analytics

Planning

- Standard guidelines for baseline study
- Comprehensive management plan and action plan
- Country specific prioritisation plan
- Best practices
• Coordinated planning and implementation
• Situation analysis
  o How much is generated?
  o Number of recycling plants etc.
  o Government of Jamaica priorities (targets, how do we compare, recommendations, commitments, SDGs
  o Proposed action plan, blueprint
• SWOT analysis
  o Strengths – assets
  o Opportunities – sector specific including the private sector
  Threats – financial implications

Communication

• Cooperation with overseas countries and territories
• Knowledge transfer amongst SIDS through different media
  o Case studies
  o Information and communication technology
• Training and capacity building
  o Regional programme for public education
  o Statistics (illustrations) of what presently exists and where we want to be (e.g. graphics)
  o Timeline for upgrading of present dumps
  o Public private partnerships
• Regional organisations involved in waste management
  o Inter-organisation collaboration
  o Public education – focus on the youth
• Linking all institutions with waste management mandates
• Institution and human resource capacity building
• Public education
  o Anti-littering
  o 3Rs
• Stakeholder identification
• Public education and awareness – stakeholder engagement
• Showcasing good/effective campaigns
  o Effective criteria for these campaigns
  o Data collection best practice
  o Cost-benefit analysis

Health

• Air quality
• Water quality
• Vector borne diseases
• Soil pollution
• Marine/coastal impacts
• Impact of waste disposal practices on all key sectors e.g. health, environment, visual
• Focus on health and environmental impacts

Economic

• Cost for waste management (all waste streams)
• Technological cost-benefit analysis for business plan development for waste recovery and recycling
• Economic and non-economic incentives
• Market trends
• PPPs
  o Green jobs
• Inaction costs
• Sustainable financing
  o What are true costs?
  o Sources of finance
    ▪ Utility bill/household levy
    ▪ Tipping fee
    ▪ Property taxes
    ▪ Export

Recycling

• Separation at source
  o Legislation
  o Facilities
  o Systems
  o Transportation/collection
• Public education & public awareness to promote separation of waste and adoption of best practices
• Conversion of waste materials to feedstock for processing (repurposing)

Waste Management Facilities

• Model standard engineered landfill
• Feasibility study for WTE based on quantity of waste generated
• Standards/guidelines for waste technologies, processes and policy
• Landfill management
  o Access control
  o Appropriate technologies
• Final disposal of residues
• Hazardous waste management across the region
  o Medical and biomedical waste
  o Chemical waste
  o Nuclear waste
  o Pharmaceutical waste
  o Sharps
  o E-waste management
• Vertically integrated solid and hazardous waste management (overriding concept)
• Appropriate technologies for SIDS
  o Size etc.
  o Resources
  o Economics
  o Geography
• Final disposal methods
  o Landfills
  o WTE
  o 3Rs
  o Composting
  o Export
Data Sources

- Waste specific
  - NSWMA (solid waste authority)
    - Waste characterisation
    - Collection volumes
    - GIS
    - Budget
  - NWC (water utility) – wastewater
  - NEPA (environmental agency) & NGOs – environmental data
  - SWANA
- Ministries of Finance – budget (national) & demographic information
- Ministries of Health
  - Jamaica NEPA/MoH – Air quality reports for landfill fires
- Economic goals and job creation
  - PIOJ
  - STATIN
- Maritime Authority of Jamaica – ship generated waste
- PIOJ
  - programmes, projects and initiatives
  - survey data (households)
- NGOs – community based initiatives
- FAO – aggregated data
- Financial Institutions
  - IDB
  - World Bank
  - CDB
- MEA focal points (Ministry of Economic growth and Job Creation)
- International Studies
  - UNEP
  - PAHO
  - CBS Netherlands
  - NGOs
  - SIDS DOCK
- WCS – SKI institutions – Academic
- PIOJ – the Management of Hazards in Jamaica
- Commercial contractors
- Control Boards e.g. Customs
- Ministry of Tourism
- Secretariats for conventions regarding waste e.g. Basel
- Local solid waste authorities
- Crowd-sourced organisations
• UN Environment
  o Regional Seas Programme
  o Regional Office
  o Global Programme of Action for the Protection of the Marine Environment from Land-based Activities (GPA)/Global Partnership on Marine Litter
  o Chemicals and Waste
• IMO (International Maritime Organisation)
• Basel Convention
• Port Authorities
• Universities (UWI MONA GIS)

**Good Quality Data**

• Data systems
• Verification monitoring
• Standardised definitions
• Primary sources
• Automated
• Environmental agencies
• NGOs
• Non-partisan organisations
• SRC – Scientific Research Council
• Haitian Ministry of Environment
• UN Environment
• Recycling Partners
• JET
• UWI, UTECH (Engineering)
• CARICOM Regional Technical Institute
• CWWA
• CAWASA – water utilities
• Ministry of Tourism – Sustainable Tourism
• Jet Blue
• NGOs
  o Negril Environmental Protection Trust
  o JET
  o CCAM
• NEPA
• ODPEM

**Case Studies**

• ICCD Country report
• “Nuh dutty up Ja” campaign
• Recycling partners of St Vincent
• NSWMA
• JSIF
• JET school environment programme
• 360 recycle
• St Eustatius – baseline study
• Aruba – waste oil project
• Galapagos – Promotion recycling plant for waste pickers
• Jamaica – EIAs, baseline data

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- Guyana – Permanent Secretaries Ministries of Communities
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**Dissemination**

- Comprehensive stakeholder list
- (Jamaica) Ministry of Economic Growth and Job Creation (Environment & CC & MEAs
- Council/forum of environmental ministers
- Regional associates – Waste, water etc
- Various ministries, agencies and UN international agencies
- Tied to the potential for financial assistance, technical assistance and economic growth (job creation and social benefits)
- SVG workshop with stakeholders and print copies
- Key government ministries
- Private sector partners
- Online
- Email
- Ministerial contact
- Champion politician
• National and regional networks and existing networks (e.g. Tourism associations, chamber of commerce, community groups)
• Utilise national and regional structures (ministries and local government agencies)
• Deliverables and timelines
• Using opportunities in particular and related meetings to present findings (strategic)
• Inclusions of processes for feedback
• Source disclosure
• Publication and promotion
• Distil main messages (and disseminate) via various means

Uptake

• Public education/awareness
• Dedicated/ sustainable source of funding
• Incentives
• Enforcement
• Tied to the potential for financial assistance, technical assistance and economic growth (job creation and social benefits)
• Provide to and sensitise key government ministers
• Private sector partners
• Online
• Workshops
• Political will
• Formal approval by cabinet of main recommendations
• Consideration and presentation at regional high level meetings (CWWA)
• Technocrat buy-in
• Identify champions