WASTE STUDY

Singe-Use Plastics within the Accommodation Services Industry in Saint Lucia

02.12.2019

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Trashing the Idea of Waste

ACKNOWLEDGEMENT

This project entitled: Phasing out of Single-use Plastics: Towards Clean Seas and Sustainable Tourism in the Caribbean, is led by the United Nations Environment Programme (UNEP) and funded by the Government of Norway. It is part of the broader project Transforming Tourism Value Chains (TTVC) in developing countries and Small Island Developing States (SIDS) for more resource efficient and low-carbon development. This is a global effort that is aimed at reducing carbon emissions and improving resource efficiency in the Accommodation Services Industry in three tourism value chains, namely i) food and beverage, ii) accommodation, and iii) meetings, incentives, conferences and events (MICE). Activities are focused in countries where tourism plays an outstanding and active role for the national economy of the Dominican Republic, Mauritius, the Philippines and Saint Lucia.

In order to achieve the aforementioned objectives set out for Saint Lucia, the Saint Lucia Solid Waste Management Authority (SLSWMA) in coordination with the Travel Foundation (TF),is supporting the implementation of the project by improving the capacity of hotels within the Accommodation Services Industry in Saint Lucia to phase out single-use plastics and introduce sustainable procurement and eco-innovation solutions.

As such, the SLSWMA has contracted the services of JUA KALI LTD. to execute several activities associated with the project.

JUA KALI LTD. is a local, social enterprise that offers technical and professional services in the field of Resource Recovery.

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SPECIAL THANKS

Thank you to the Saint Lucia Solid Waste Management Authority for facilitating the Waste Study and in particular, the staff at the Deglos Sanitary landfill for supporting the Waste Audit activities.

A special thank you to the hotels who participated in this study:

- Bay Gardens Inn
- BodyHoliday, Le Sport St. Lucia
- Boucan by Hotel Chocolat
- Calabash Cove Resort & Spa
- Cap Maison Resort & Spa
- Fond Doux Resort & Plantation
- Marigot Bay Resort, Spa & Marina
- The Landings Resort & Spa

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EXECUTIVE SUMMARY

It has been recognized that, without introducing greener practices, by 2050, tourism's energy use and greenhouse gas emissions are set to double, with even greater increases in water use and waste disposal."

~ The Travel Foundation(TTVC Brochure – Saint Lucia, 2019)

Introduction

According to the United Nations World Tourism Organization (WTO), tourism is the third largest export globally, after chemicals and fuels. Last year (2018) saw one point four (1.4) billion tourists travel the world – two years ahead of what was projected, and this is expected to climb to one point eight (1.8) billion by 2030, (UNWTO 2019). This is great news for a tourism hotspot like Saint Lucia. However, in parallel and at the global scale, is a growing environmental movement against plastic pollution and single-use plastics (SUP) more specifically. Growing awareness about the catastrophic impacts of SUP waste has triggered bans against the importation and use of specific SUP items like straws, single-use grocery bags and take-away food containers. In Saint Lucia, the Government most recently passed the Styrofoam & Plastics Food Service Containers (Prohibition) Act 2019, starting with the ban on the importation of Styrofoam containers and extending this to a full ban on the use of these by the end of 2020.

Given the ubiquitous nature of SUP within the tourism sector, the accommodations services industry in particular is at a watershed moment recognizing the need to safeguard the very environment it depends on to attract visitors, while contending with operational changes required to transition away from SUP. UN Environment Programme under the project on **Phasing Out Single-use Plastics – Towards Clean Seas & Sustainable Tourism in the Caribbean**, aims to assist hotels in making this transition and to achieve the following overall targets as part of the Low Carbon and Resource Efficient Action Plan for Accommodations in Saint Lucia by 2030:

1. **A thirty percent (30%) reduction** in the amount of waste generated by the Accommodation Industry; and

2. **A one hundred percent (100%) reduction** in SUP procured by the Accommodation Industry.

Objectives of Study

Meeting these targets would therefore require undertaking a Waste Study to understand the current state of affairs in terms of plastic waste generally and SUP more specifically. The specific objectives are outlined below.

Objective 1: To increase the knowledge of Saint Lucian authorities and the tourism sector about the waste streams generated by hotels, especially plastic waste, to determine the major single-use plastic products discarded and the current waste management and disposal practices in the Accommodations Services Industry.

RESULT 1:

Produce a baseline for plastic materials procured/used and identify their current waste management and disposal practices.

Objective 2: To improve the capacity of hotels within the Accommodation Services Industry for proper management and reduction of plastic waste.

RESULT 2:

Recommendations & Best Practices toolkit, with emphasis on sustainable procurement and eco-innovation solutions for the adequate and integrated management of plastic waste.

Methodology

In order to achieve these objectives, three complimentary research methods were utilized:

1. A waste audit - provided raw data on the quantification and composition of hotel solid waste generally and SUP waste specifically;

2. Surveys - served as a tool to capture both quantitative data regarding the hotel operations and waste management practices; and

3. Interviews - captured the more nuanced, qualitative data from hotel leads who filled in the gaps and provided a higher level of understanding of the hotel environment.

In total, eight (8) hotels were selected to participate in the Waste Audit using a representative sampling methodology. The number of hotels ultimately chosen was significantly smaller than the recommended thirty-two hotels due to the budget and time constraints. Nevertheless, following this methodology would allow the audit to be replicated with more hotels in the future and thereby reduce the margin of error and produce results that would be more reflective of the sample frame and with greater statistical significance.

Key Findings

The total mass of solid waste collected from the eight (8) participating hotels within a 24-hour period was 2,728.7kg. The waste audit revealed that Organics represented the single largest component of the hotel solid waste at 56.7% by weight. However, food scraps comprised 79.3% of this organic matter, while green waste comprised the remaining 20.7%. The second largest waste stream was Plastics at 11.7%, followed by Cardboard at 9.1%, Glass at 8.6% and Tissue at 6.4%. The average waste generation rate per guest per day was calculated at 4.2 kg/guest/day, while the individual hotels ranged from 1.1 kg to 12 kg.

A total of thirty-two (32) types of single-use items were identified during the waste audit amounting to seven thousand, three hundred and sixty-eight (7,368) individual pieces of plastic waste

generated in 24- hours. The individual SUP generation per guest per hotel ranged from 4.3 pieces to 32.8 pieces. Additionally, the average cling wrap waste generated was 2.3 kg per hotel.

In the absence of a formal national waste diversion system, some hotels have still been able to divert the following materials: 1. Food scraps to pig farmers; 2. Organic vegetable and fruit peels, green waste and print/office paper for on-site composting; 3. Return of breakable bottles to local suppliers (Brewery & distillery).

With regard to SUP, seven out of the eight hotels were actively or had transitioned away from using them or introduced alternatives. The two most popular items of focus were straws and take-away containers, despite the fact that back-of-house SUP waste generation was more significant. SUP reduction and elimination programmes were generally focused on front-of-house source generation, and for only three hotels were these programmes tied to a broader sustainability agenda. Moreover, some of the sustainable alternatives transitioned to by hotels for example paper straws and compostable bin liners, are in fact unsustainable.

Therefore, given the disjointed approach to phasing out SUP, the need for information and expertise on sustainable alternatives, and the integration of more sustainable procurement practices, an 8-Step Pathway to Action was developed to complement this Study and provide tools to hoteliers to help them successfully transition away from SUP.

ABBREVIATIONS

ANOVA	Analysis of Variance
ASTM	American Society for Testing and Materials
MSW	Municipal Solid Waste
PLA	Polylactic Acid
SIDS	Small Island Developing States
SLHTA	St Lucia Hotel and Tourism Association Inc.
SLSWMA	Saint Lucia Solid Waste Management Authority
SLTA	Saint Lucia Tourism Authority
SUP	Single-use plastics
SWM	Solid Waste Management
TF	Travel Foundation
TTVC	Transforming Tourism Value Chain
UNEP	United Nations Environment Programme
UNWTO	United Nations World Tourism Organisation
WTO	World Trade Organisation

I. CONTEXT– SINGLE-USE PLASTICS & WASTE MANAGEMENT

1.1 PLASTIC: Our Collective Love Affair

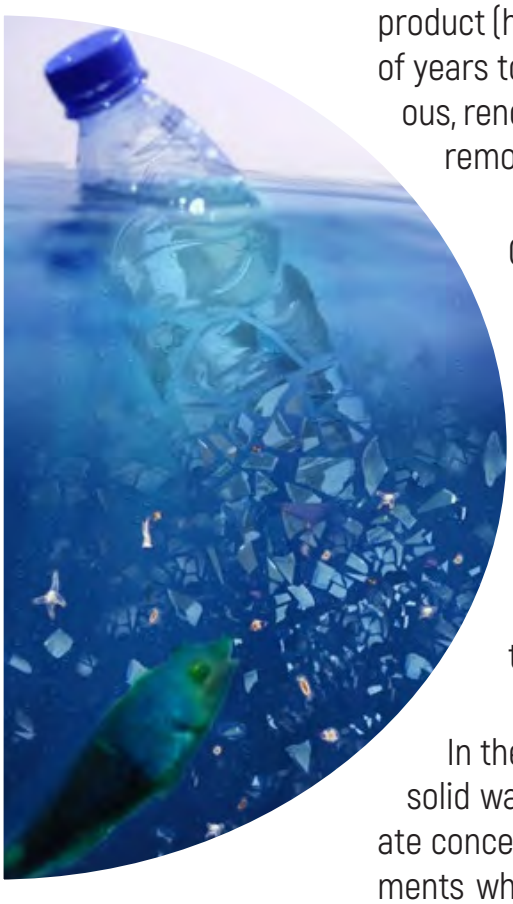
Single-use plastics (SUP) are affordable, lightweight, durable, hygienic and incredibly convenient. These are plastics that are intended to be used only once before being thrown away or recycled (UNEP, 2018, p.14). In hotels within the Accommodation Services Industry, they have become ubiquitous from cups and straws, to bathroom toiletries and amenity kits, from individually wrapped pillow mints to take-away containers and cutlery, from minibars to breakfast buffets, event spaces, the kitchen, supplier deliveries, and much more(Skift, 2019). Moreover, as a space that is shared with many other strangers, hotel hygiene is high on a guest's priority list, and SUP help to "...convey newness and cleanliness to guests, meaning these amenities are fresh, sanitary, and just for you," (Skift, 2019). On par with fears of unhygienic hotel rooms are fears of non-potable water by some guests who prefer the safety of a sealed plastic bottle of water. SUP makes it easy for guests to carry it with them, while also making housekeeping and kitchen food prep quick and easy when items can just be thrown in the trash. Plastics have much to offer both hotels and visitors alike and both parties are guilty of supporting this collective love affair.

However, as with all clandestine relationships, there is a dark side – waste. In a Small Island Developing State (SIDS) like Saint Lucia which typically welcomes over twice its population size of 178,696 people, in terms of annual visitors, these SUP become part of the two kilograms(2kg) of waste produced per day per stay-over visitor or the six thousand, four hundred and thirty-six point four metric tons (6,436.4MT) of waste produced by hotels per year, (The Central Statistical Office of Saint Lucia, 2018).

This represents 8.3% of the national municipal solid waste generated in Saint Lucia per year, (SLSWMA – Waste Disposal Summary for all Landfills in Saint Lucia 2004 – 2019).

1.2 The Problem with Single-Use Plastic

The problem with most SUP waste, unlike other waste material, is that it does not biodegrade into organic compounds that can return to the soil. Instead, they photodegrade and breakdown into smaller and smaller particles upon exposure to UV irradiation (e.g. sun) and/or abrasion from waves (UNEP, 2018). Plastics are a petroleum by-product (hydrocarbon) - a non-renewable resource - and can take hundreds of years to degrade. It is this continuous fragmentation that is most insidious, rendering plastic waste almost untraceable and extremely difficult to remove from the open environment and ocean.



[Photo Credit: National Geographic Society Newsroom - Pesky Plastic: The True Harm of Microplastics in the Oceans by Jessica Perelman]

Once in the natural environment, the SUP such as grocery bags may be ingested by marine animals who confuse them for food either suffocating them or starving them. If not ingested, the SUP may entrap or entangle marine life, ultimately killing them. Furthermore, the chemical properties of SUP attract other potentially toxic and/or carcinogenic persistent organic pollutants - chemicals that accumulate through the food chain - and adhere to the microplastic particles (Diez et al., 2019). These microplastics then interact with marine organisms where they are ingested and travel up the food chain to human beings.

In the Caribbean region, plastics make up only a small fraction of total solid waste (generally less than 20%); however, there is a disproportionate concentration of plastic litter found in the marine and coastal environments when compared to population and local consumption. In 2017, the International Coastal Cleanup organized by the Ocean Conservancy provided a useful snapshot of the level of litter in coastal areas in the region (based on the islands that participated in the clean-up). An average of two thousand and fourteen (2,014) litter items per kilometer were found on beaches and coastal areas as compared to a global average of five hundred and seventy-three (573). The top SUP found was plastic bottles at twenty-one percent 21%, (Diez et al., 2019)

1.3 The Challenges with Solid Waste Management

In Saint Lucia, the national government is responsible for solid waste management (SWM), inclusive of collection, transport, treatment and disposal. This responsibility for the coordination and integration of systems was passed on to the statutory body, the Saint Lucia Solid Waste Management Authority (SLSWMA) established in 1996. The main legal instruments providing the legal, regulatory and financial framework for the Authority are: the Waste Management Act of 2004, and the Environmental Levy Order 1996, which provides a supplementary funding mechanism by establishing a charge - to be levied by SLSWMA - and paid by every visitor to the island (Riquelme, 2016).

However, one of the key challenges faced by the Authority is the perennial under-funding to fully support waste collection expenditure. As such, the Waste Haulers who are contracted by the Authority to collect residential and public waste, are ill-equipped to maintain and/or replace outdated vehicles to ensure timely and efficient collection schedules (Luken, 2017).

Weak institutional SWM infrastructure and mismanagement, and the lack of formal Resource recovery services coupled with the indiscriminate generation and disposal of waste generally, and SUP waste in particular, has led to a devastating and pervasive environmental crisis. Of critical concern is marine pollution and its direct and immediate threat to the island's revenue from tourism, which accounts for up to eighty percent (80%) of services export and remains the dominant source of employment and foreign exchange (Diez et al., 2019).

1.4 The Global Movement Against Single-Use Plastics

Globally, the catastrophic impact of SUP waste on the environment is slowly coming to the foreground, and governments around the world have begun implementing a number of legal instruments to combat this plastic waste crisis. Saint Lucia has joined thirteen other Caribbean countries - from Aruba to Haiti to the U.S. Virgin Islands - in banning plastic bags and/or Styrofoam as part of their efforts to tackle marine pollution. National directives such as these bans give legs and legitimacy to the cause.

[SURFRIDER Foundation's anti-plastic campaign: https://www.surfrider.org/say-no-to-single-use-plastic]

Among hotels, the conversation around travel size shampoo bottles, straws, and other common SUP used on property is gaining momentum. Many hotels have set plastics-related sustainability goals towards becoming more responsible businesses and playing their part in reducing the impact of plastics on the environment on which they depend. Some examples are:

- **Hilton Hotels** plan to cut 250 million plastic straws globally and is also actively addressing cotton buds, drink containers, cutlery and plates;

- **Marriott** International pledges to remove plastic straws and stirrers globally and to replace toiletry bottles with refillable containers; and

- **EDITION hotels** – the Luxury brand of the Marriott – plans to be 90% free of SUP by the end of 2019, with the intention of being 100% free of SUP by the end of 2020.

However, their motives are not to be considered completely altruistic. Legislative bans are forcing hotels into action. The European Union, which represents a significant market segment for visitors to the Caribbean has approved a ban slated for 2021, focusing on cutlery, plates, cotton buds, straws, and stirrers. As such, the visitors are becoming more conscious of the environmental issues associated with plastics and are demanding change.

II. WASTE STUDY RATIONALE

Given the aforementioned environmental crisis, and the changing visitor profile, the timeline is crucial for hotels to accelerate their efforts in reducing/eliminating SUP and ultimately move towards sustainability. Moreover, specific targets for waste generation and reduction have been set for the Accommodation Industry as part of the Low Carbon and Resource
Efficient Action Plan for Accommodation in Saint Lucia for the project, Transforming Tourism Value Chains in Developing Countries and Small Island Developing States. The overall targets by 2030 are as follows:

1. **A thirty percent (30%) reduction** in the amount of waste generated by the Accommodation Industry; and

2. **A one hundred percent (100%) reduction** in SUP procured by the Accommodation Industry.

Under the auspices of sustainability, some hotels have concentrated their efforts on energy and water policies as these are easily tracked routinely calculated by utility companies. They also offer very clear results in the form of financial gains with increased resource efficiency.

Measuring waste reduction targets on streams like SUP has been deemed a more daunting challenge despite of the ubiquitous nature of these items, creating greater apprehension towards setting long-term goals.

As such, the goal of this study is to measure the generation and management practices of hotels as it relates to waste generally, and SUP specifically. By utilizing metrics to quantify and paint the big picture, hoteliers, policymakers and other key stakeholders can have a more in-depth understanding of the work needed to be done. It will also allow for the quantification of change over time.

This waste study shall provide a baseline to catalyze the necessary waste reduction actions among hotels in Saint Lucia.

Furthermore, the study is not intended to exist in isolation, but rather will to be supported by a Recommendations & Best Practices Toolkit, which will arm hoteliers with the information to take the first steps towards sustainability and SUP waste reduction specifically in a systematic manner.

III. METHODOLOGY

In order to provide a holistic overview of hotel solid waste and waste management processes generally, and SUP specifically, three complimentary research methods were utilized: waste audits, surveys and interviews. The waste audits provided raw data on the quantification and composition of hotel solid waste. The surveys served as a tool to capture both quantitative data regarding the hotel operations and waste management practices, while the interviews captured the more nuanced, qualitative data from hotel managers who filled in the gaps and provided a higher level of understanding of the hotel environment. The results were collected and analysed to create a solid waste baseline.

3.1 Waste Audit

Waste audit or waste characterization is a systematic process of identifying the composition and quantity of solid waste generated by a facility or location. There are two basic approaches to evaluating waste generation:

1. Site-specific (US EPA, 2015).– The solid waste material is sampled, sorted and weighed according to pre-determined waste streams such as plastic, glass, cardboard, construction & demolition, food scrap, and green waste etc. This methodology is useful in defining local waste streams, in particular, where large numbers of samples are taken over an extended timeframe. The advantages of utilizing this method include:

- Ability to track variations due to seasonal changes, population density, regional differences etc.

- Ability to capture waste streams such as food scraps and yard trimmings,which can only be estimated through sampling and weighing studies.

2. Material flow(US EPA, 2015) –The solid waste streams and quantities are estimated based on the compilation of data from several, but specific sources, namely: production data (by weight) for the materials and products in the waste stream with adjustments made for each material and product category. Adjustments are made for imports and exports, and for diversions from the waste stream. Adjustments are also made for the lifetimes of products. Finally, food scraps, yard trimmings, and a small amount of miscellaneous inorganic wastes are accounted for by compiling data from a variety of waste sampling studies. This method is ideal for national level studies.

For the purposes of this study, the site-specific methodology was identified as the most appropriate option given the following factors:

- Primary data required for baseline study;
- Relatively "small" subset under examination i.e. hotels;
- Lack of/inadequate secondary data sources to provide relevant hotel and waste specific information; and the
- Need to capture the waste streams of food scraps and yard trimmings.

The site-specific method consists of three (3) main steps: 1. Sampling; 2. Material sorting (usually a manual process); and 3. Weighing. These results then allowed for a waste analysis to be conducted.

3.2 Hotel Sampling

The hotels that participated in the study were selected from a master list of forty-two (42) hotels. This list was compiled by cross-referencing the catalogue of accommodations available on the Saint Lucia Tourism Authority's (SLTA) official website with the accommodations list provided by the Travel Foundation and sourced from the SLTA and SLHTA. It should be noted that a total of forty-six (46) hotels were identified in the master list;however, four (4) were removed from the list since three hotels were no longer in operation and one hotel was only partially operational with a long-term clientele. See ANNEX 1 for the final list of forty-two (42) hotels.

3.21 Sample Size

A representative sample of hotels was sought for the project, so that the data collected, and analysis conducted would be applicable to the entire hotel population, within a specific margin of error. However, utilizing the standard parameters of a 5% margin of error, 95% level of confidence and 50% response distribution required sample size of thirty-eight (38) hotels. Due to constraints of budget and time, a sample size of eight (8) hotels was selected.

It was accepted that this smaller sample size would have a wider margin of error than the recommended representative sample and that the baseline results would be limited in their generalizability of the target population. The rationale to move forward in this way was that the sample would still be more accurate in results than a case study sample for example, which would not be reflective of the target population. Furthermore, the systematic and logical approach used would allow for the study to be repeated with more hotels in the future and thus improve the accuracy of the results by reducing the margin of error.

3.22 Sample Frame

Within the master list of hotels, significant variation was observed in terms of the size of the establishments, which was measured according to maximum occupancy based on the assumption of a positive relationship between waste generation and number of people. The maximum occupancy ranged from thirty (30) to three hundred and eighty-five guests (385). As such, the master list was further refined via **stratified sampling** which divided the hotels into quartiles according to occupancy. Subsequently, **random sampling** was conducted in each quartile, with the final hotel selections being made – two (2) from each quartile. See Table 1 for the final selection.

TABLE 1: Sample frame for Waste Study

QUARTILES	HOTEL	OCCUPANCY RANGE
Tier 1	The Body Holiday Le Sport St. Lucia	≥ 197.5
	The Landings St. Lucia Resort & Spa	
Tier 2	Cap Maison Resort & Spa	99.5 – 197.4
	Marigot Bay Resort & Marina	
Tier 3	Calabash Cove Resort & Spa	48.75 – 99.4
	Bay Gardens Inn	
Tier 4	Fond Doux Plantation & Resort	≤ 48.74
	Boucan by Hotel Chocolat	

All hotels selected were contacted by the SLSWMA and their approval secured for participation in the Waste Study.

3.3 Waste Sampling

According to the American Society for Testing and Materials (ASTM) procedures for measuring the composition of unprocessed MSW by employing manual sorting, the mean composition and quantity of MSW should be based on the collection and manual sorting of a number of samples of waste over a period of seven (7) days, (ASTM D5231-92, 2016). However, due to project constraints for the Waste Study, the hotel waste collected represented only one (1) twenty-four hour period per hotel. It should be noted that while hotel waste is typically collected by a private waste hauler servicing several commercial houses, specific arrangements were made to ensure that the waste collected was that of the hotel in question ONLY.

Moreover, while standard practice would require the extraction of a waste sample from the total mass of waste collected for the waste audit, the lack and/or unavailability of records on daily waste generation from each hotel coupled with the unknown hotel occupancy for the waste audit period (at the time) made it difficult to determine an appropriate waste sample size. As such, the decision was made to audit the total waste collected per hotel for the 24-hour period. The waste from each hotel was collected and sorted on a designated day. One waste audit was conducted per day.

3.4 Waste Sorting Procedure

The waste audits were conducted at the Deglos Sanitary Landfill in Bexon, where a suitable area was identified and designated for the sorting activity:

- The waste hauling vehicle - carrying the waste for one hotel - was weighed upon entry and exit from the facility, the weights were recorded by the Weighbridge Attendant;
- The waste material was then discharged onto heavy-duty tarpaulins in the designated sorting area;
- The waste was manually sorted into pre-determined categories, each representing a solid waste stream composed of similar material properties and chemical composition;
- The waste within each category was weighed and the proportion of each waste stream was described as a percentage of the total waste mass expressed in kilograms.

A total of sixteen (16) waste streams were identified, including but not limited to: plastics, paper, glass, cardboard, and organics. The complete list of waste streams and descriptions may be found in below.

TABLE 2: List of Material Waste Categories & Descriptions

No	WASTE STREAMS	
	Waste Category	Description
1.	Cardboard	Paperboard, containerboard, cardstock
2.	Paper	Print/office paper, newspaper, magazine
3.	Tissue	Toilet paper, napkins, tissue, paper towel
4	Plastic	Food packaging, drink bottles, straws, cutlery, toiletries
5	Glass	Breakable bottles and jars
6	Organics	Food scraps – plate leftovers, vegetable and fruit scraps
		Green waste – yard trimmings, branches, leaves, wood
7	Metal	Aluminum and steel cans from kitchen
8	Textile	Table cloths, robes, bedsheets, rags, towels
9	Nappy	Sanitary napkins, tampons, diapers
10	Ceramics	Ceramics, minerals, lightbulbs
11	Chemicals	Soap, cosmetic residues
12	Hazardous waste	Paint, oils, fertilizer, varnishes
13	Construction & Demolition	Drywall, silicone tubing, piping,
14	Scrap metal/white waste	Appliances
15	Electronics	Mobiles, wires, headphones, laptops
16	Miscellaneous/ Trash	Anything that does not fit into a category above

Once all waste was sorted and measured, the plastic waste material was brought back out and emptied onto the tarpaulin once more. The plastics were then sorted according to single-use items, which were then individually counted and recorded according to type. The types of items were not pre-determined, but rather were based on what was identified on-site. Over 30 different items were observed and counted including water bottles, food packaging, latex gloves etc (see ANNEX 2). The clear, plastic cling wrap was the only item that was not counted given the nature of the material. Once collected, all cling wrap was weighed together at the end of the activity. Food residue would have been cleaned from the surface of the cling wrap during the initial waste sorting so as to ensure a true weight value.

Photo Credit: JUA KALI LTD. Hotel Waste Audit, July 2019

3.5 Surveys and Interviews

Three surveys were submitted to each hotel representative, targeting the following audience: 1.) the Hotel Manager/Owner; 2.) the Procurement/Accounts Manager; and 3.) All other department heads (general). The objective was to collect data on the following themes:

- Hotel profile e.g. occupancy, clientele, facilities/amenities, market segment, rating etc;
- Hotel operations related to waste management e.g. overall process, waste management system, designated staff responsibility, level of solid waste reduction and/or diversion practices, management of SUP, challenges etc;
- Hotel environmentalism e.g. green certification, perception/awareness and attitude towards environment, CSR, sustainability system/officer etc; and
- Hotel procurement practices related to SUP and SUP alternatives.

The surveys were completed by seven (7) out of eight (8) participating hotels and provided rich information that complimented the waste audit data. It provided a more holistic understanding of the current level at which the hotels are operating as well as the environment within which they are navigating as it relates waste management generally and SUP management specifically.

Follow-up interviews were held with the management/staff of five(5) hotels, while one (1) hotel representative, though unable to meet, responded to additional queries via email. Two (2) hotels representatives did not participate in the interviews. During the in-person exchanges, the hotels were shown their respective results from the waste audit to ignite discussion. Questions were semi-structured, allowing for a more open dialogue and sharing of thoughts, ideas and clarification to bridge the gaps from the surveys and waste audit, while also providing valuable contextual information.

IV. HOTEL SOLID WASTE ANALYSIS & RESULTS

In order to provide a holistic overview of hotel solid waste and waste management processes generally, and SUP specifically, three complimentary research methods were utilized: waste audits, surveys and interviews. The waste audits provided raw data on the quantification and composition of hotel solid waste. The surveys served as a tool to capture both quantitative data regarding the hotel operations and waste management practices, while the interviews captured the more nuanced, qualitative data from hotel managers who filled in the gaps and provided a higher level of understanding of the hotel environment. The results were collected and analysed to create a solid waste baseline.

4.1 Results & Data Analysis

All data were compiled into excel sheets to conduct statistical analysis. The first step was to calculate the waste composition (waste stream) as a percentage of the total waste mass expressed in kilograms. The total mass of solid waste collected from the eight (8) participating hotels within a 24-hour period was 2,728.7 kg. The waste audit revealed that Organics represented the single largest component of the hotel solid waste at 56.7% by weight. However, food scraps comprised 79.3% of this organic matter, while green waste comprised the remaining 20.7%. The second largest waste stream was Plastics at 11.7%, followed by Cardboard at 9.1%, Glass at 8.6% and Tissue at 6.4%

GRAPH 1: Hotel Waste Composition & Quantity in Weight (kg)

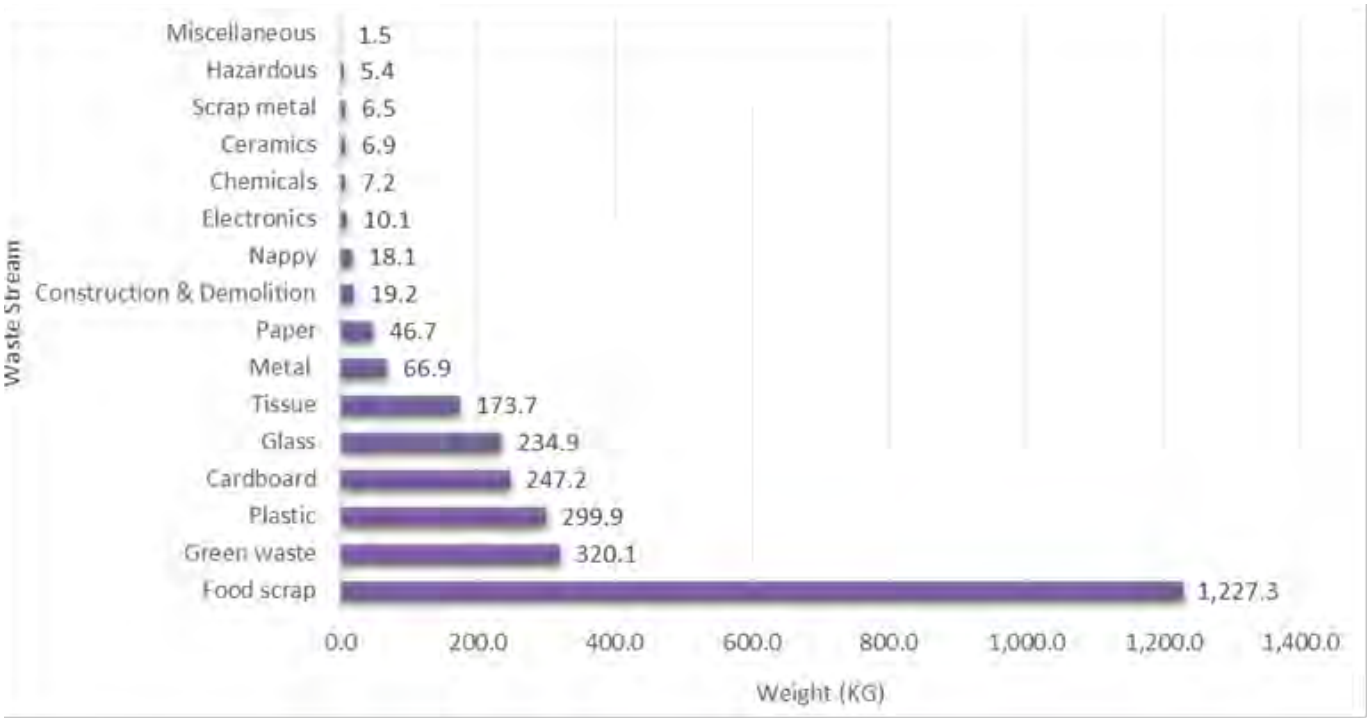
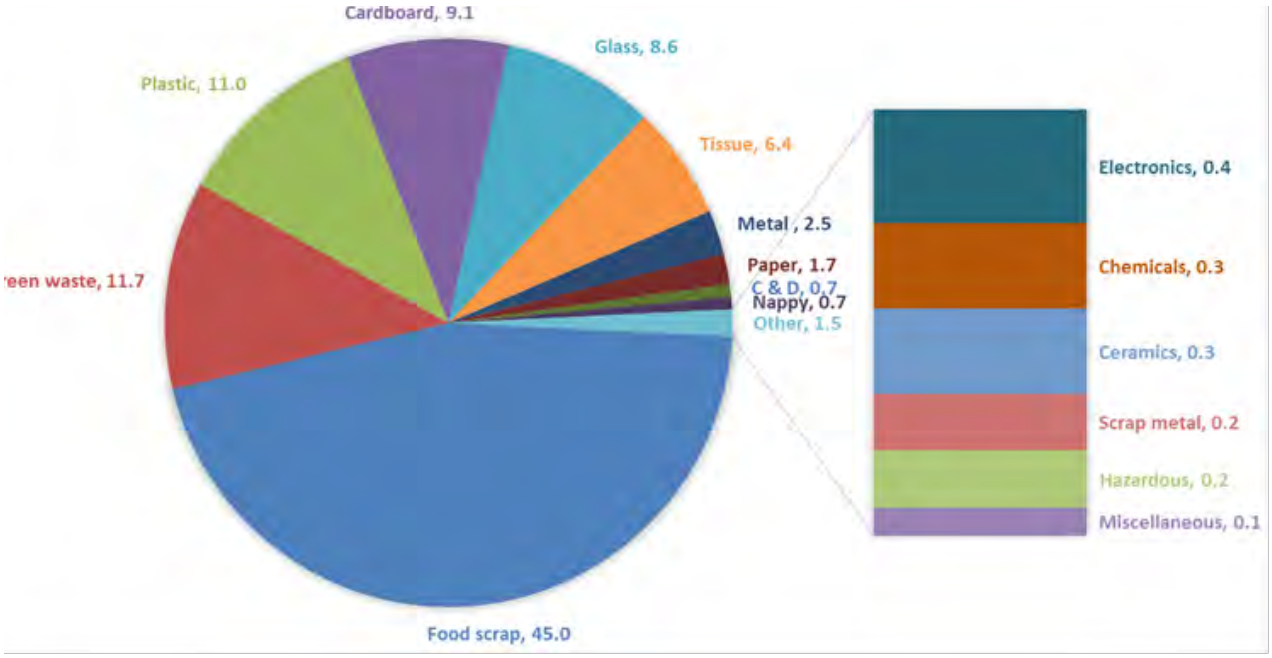
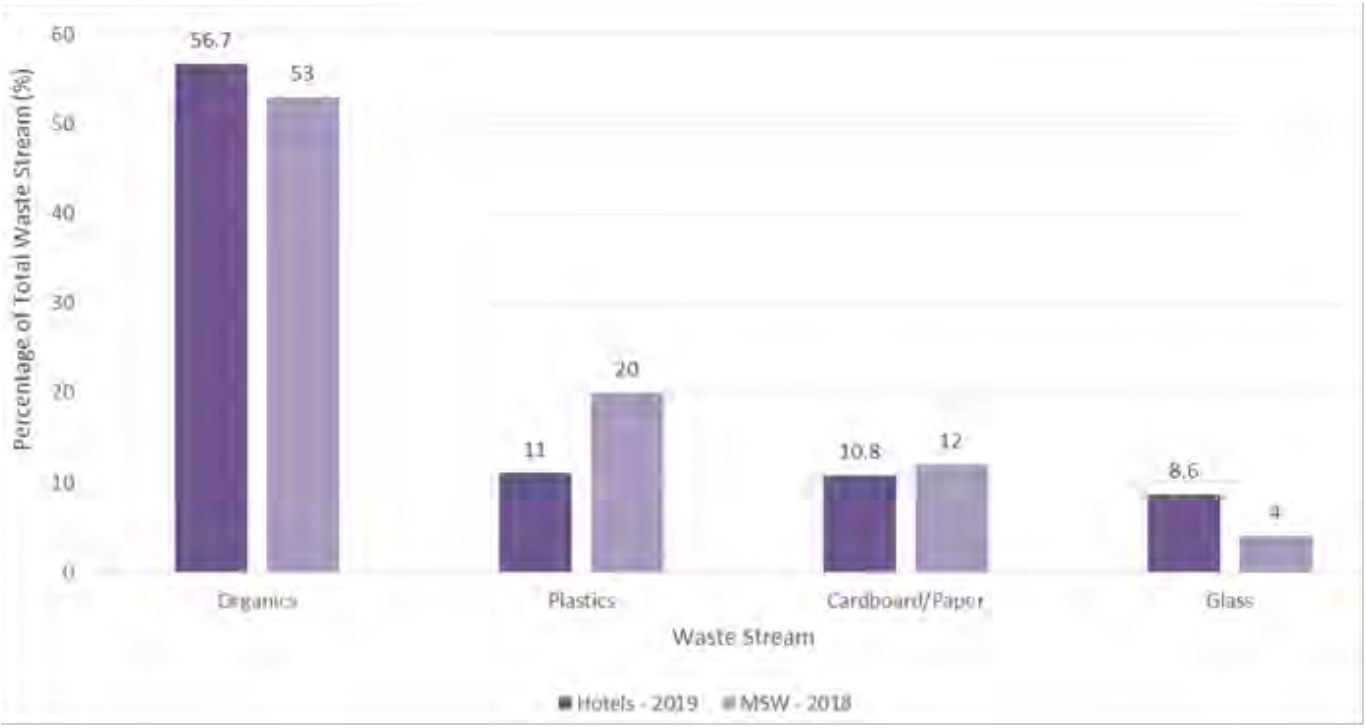


CHART 1: Hotel Waste Composition & Quantity by Percentage (%)



Hotel waste is generally considered to align closely with residential waste in terms of composition and proportions. This was confirmed with a comparison of the composition of the municipal solid waste based on the waste characterizations from 2018 and 2010 conducted by the SLSWMA. The hotels waste shared four (4) out of five (5) top waste streams with the MSW, and the proportions were within 10 percentage points.

GRAPH 2: Comparison of Hotel Waste with MSW in 2018



Further analysis was conducted to determine whether there were any sufficiently significant levels of influence on the dependent variable - total hotel waste -by any of the independent variables captured in the surveys. This was done via an Analysis of Variants (ANOVA) test, and the list of independent variables analysed were as follows:

1. Maximum occupancy;
2. Green certification;
3. Hotel rating/classification;
4. Facilities/amenities;
5. Waste Management Plan;
6. Designated staff/department with responsibility for waste management;
7. Sustainability Management System or Environment Management System;
8. Environmental or Sustainability Strategy;
9. Environmental or Sustainability Manager;
10. Sustainable Procurement Policy;
11. Hotel communication with key holders;
12. Training of staff on environmental issues;
13. Awareness of negative impact of SUP; and
14. Level of concern about SUP on property.

A significant level of influence was observed by the independent variable, maximum occupancy, on the dependent variable total hotel waste. The relationship between occupancy and waste generation had been assumed and used as a parameter for the stratified sampling earlier. This finding further validated that there was a significant relationship between the two variables. This relationship made sense, as each new guest being accommodated would use the facilities/amenities and other resources available on property, and as such, would inevitably create a waste footprint. It is in the size of this footprint where hotels have the greatest opportunity to impact waste generated directly by guests through the resources that they use, think branded reusable guest water bottles, to the policies they implement such as the "no straw" policy. However, it should be noted that this relationship represents only one source of waste, that is, the guest, while there are other sources of waste generation related to overall hotel operations that would need to be examined.

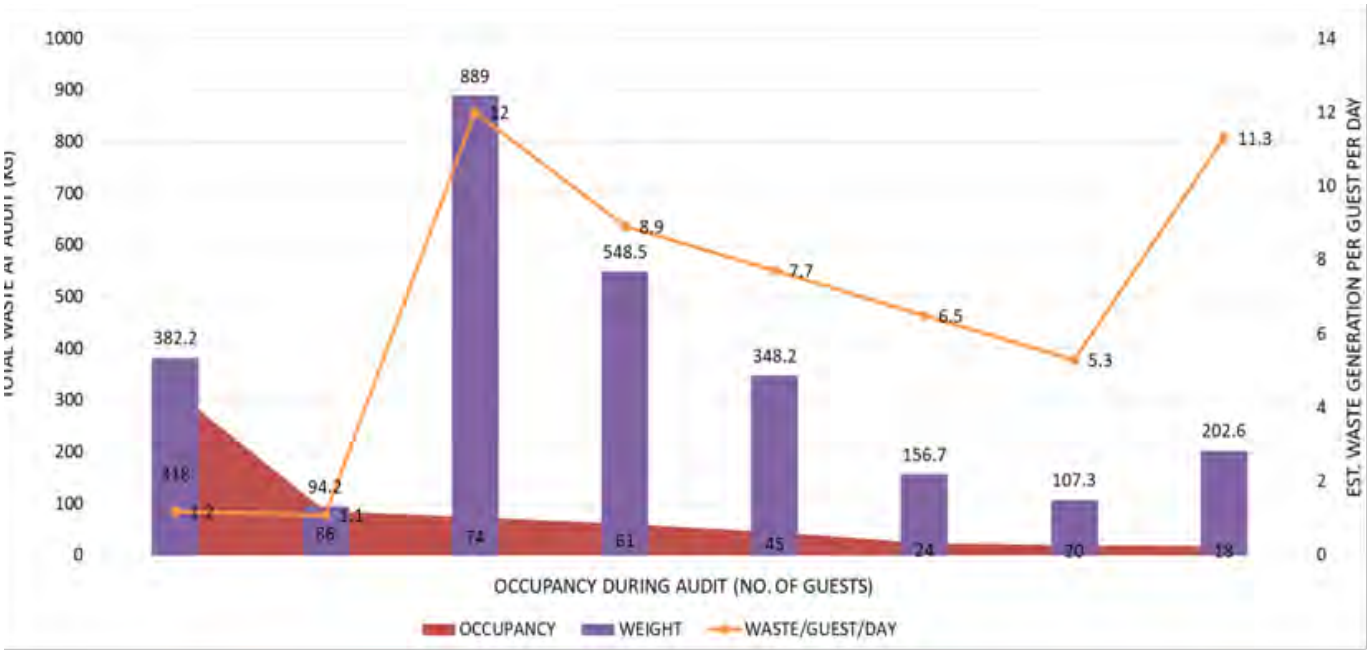
All other independent variables listed failed to denote a true variance with the dependent variable. One of the reasons for this may be due to insufficient variation in responses from the hotels due to the small sample size.

Furthermore, the average waste generated per guest per day was calculated by dividing the total waste collected during the audit by the total occupancy recorded for the audit period. This was recorded as 4.2kg/day/person. Given that the staff contribution to the total hotel waste could not be accounted for due to insufficient data, one could assume that the actual waste generation per guest per day would be somewhat lower than the 4.2 kg/day/person.

Moreover, it should be noted that the average waste generation per guest per day at the individual hotels ranged from 1.1kg to 12kg. Based on the four (4) tier sampling system, the largest hotel within the sample had the second lowest waste generation rate of 1.2 kg/guest/day, and the smallest hotel had the corresponding second highest waste generation rate of 11.3 kg/guest/day. While one may be tempted to contend that larger hotels are more resource efficient than smaller hotels given their ability to minimize overall waste generation per guest, the results are mixed. A tier one hotel (second largest in the sample) actually recorded the highest waste generation per guest at 12kg/guest/day; interestingly, their occupancy of 74 for that waste audit day, which was actually more akin to that of a mid-sized hotel. That being said, the lowest waste generation rate was recorded by a mid-sized hotel at 1.1 kg/guest/day with an occupancy of 86. Additionally, the remaining four hotels, which may be categorized as small to mid-sized,denote a declining waste generation rate as the occupancy decreases.

Though there is a strong, positive correlation between MAXIMUM OCCUPANCY and TOTAL WASTE, it does appear that other variables influence the strength of the "occupancy" variable to predict waste generation once we look at occupancy beyond the parameter of a hotel's maximum carrying capacity. Additional data points, that is, a larger sample, would be required in order to further explore what these other factors could be and determine any concrete trend/correlation or any significant similarities or differences between occupancy, hotel size and waste generation.

GRAPH 3: Hotel Waste Generation Rates Based on Waste Audit



V. HOTEL WASTE MANAGEMENT PRACTICES

5.1 Process

All the hotels shared the same general procedure for the collection of waste generated on property:

Step 1 - Staff from each department removed the waste from their respective areas of responsibility in garbage bags and/or plastic bins.

Step 2 – The waste was brought to a central location on property, what is generally referred to as the "back-of-house". In some cases, it was a separate closed room, in others it was a walled off or enclosed, out-door space. The collection area either contained plastic bins, skip bins or roll-on-roll-off bins. In one case, there was a separate holding area for flattened cardboard carton boxes, though this was ultimately disposed of with the rest of the hotel's waste.

Step 3 – The waste was collected once a day by a private contractor/waste hauler. The waste was hauled to the Deglos Sanitary Landfill in Bexon.

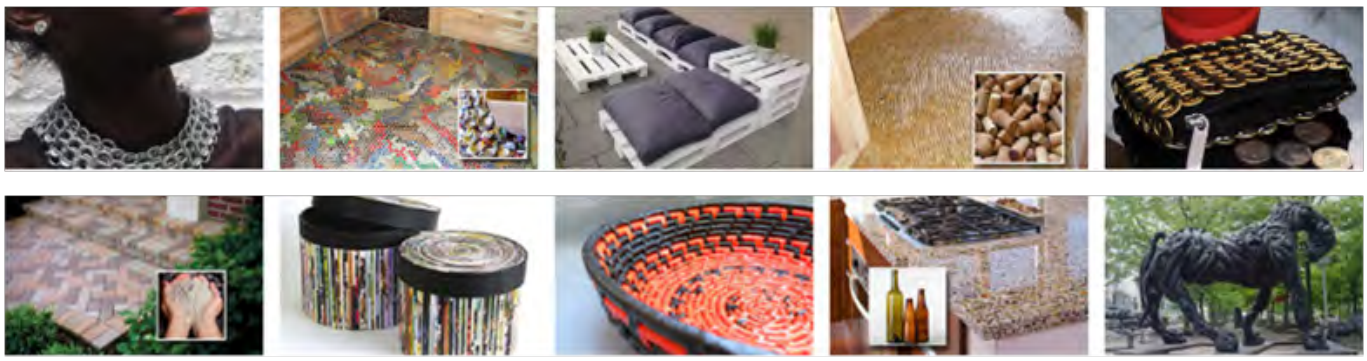
It should be noted that one hotel does not contract a private waste hauler, but rather utilizes the public, curbside collection system for the disposal of their waste, due to the relatively small amount of waste generated.

Furthermore, only one hotel indicated the designation of a staff member with responsibility for the overall waste management on property.

5.2 Resource Recovery

The term resource recovery, in its broadest sense includes the "repairing, refurbishing, or remanufacturing of discarded goods; the separating, reprocessing, and recycling of raw materials such as glass, paper, or aluminum; and the processing of selected fractions of the waste stream into new products such as compost or energy", (Bartone 1990, p.7). Over the years, this definition has evolved to reflect the more radical change in thinking and behaviour required by consumers in light of one of the most urgent anthropogenic environmental crises, plastic pollution. Most recently, JUA KALI LTD. has re-defined Resource Recovery for the management of secondary raw materials (trash) according to the following hierarchy of actions, with the recognition that as one goes down the list, the greater one's negative environmental impact:

- **Re-think** – Assess your needs vs. wants to determine whether an item is really necessary;
- **Refuse** – Say NO to unnecessary waste like that SUP bag or take away container;
- **Reduce** –If it is a must, minimize your waste by purchasing only as needed;
- **Rot** – Divert organic waste to make compost;
- **Reuse** – Invest in reusable items like water bottles and bags;
- **Repair** – Fix or refurbish items when broken or old instead of throwing them out;
- **Repurpose** – Get creative and give an item a brand-new look or function like turning a glass jar into a vase;
- **Upcycle** – Add value to a material or item by transforming it in both look and function like using organic citrus peels to create a non-toxic, cleaner;
- **Recover** – Clean and drop-off items at the nearest collection depot;
- **Reprocessing/remanufacturing** – this is the industrial process of transforming items to create new products.



While a formal waste diversion system does not currently exist on island, there is a level of informal waste diversion being practiced by some hotels for specific waste streams. See Table 3 below. All other waste streams including plastics are not diverted and end up in the landfill.

TABLE 3: Hotel Waste Generation Rates Based on Waste Audit

Waste Stream	Diversion Mechanism	% Of Hotels Engaged	Notes
Food Scrap	Food Scrap	62.5	Some hotels have ceased this practice due to issue of theft. For hotels that do practice, it is unclear as to the average waste diverted in this manner due to the inconsistency of the practice and lack of weighing to know how much food scraps are actually channeled this way.
Fruit & Vegetable Scraps	On-site Composting	62.5	The specific waste stream used varied depending on the capacity of the hotel to undertake this activity.
Green Waste			
Paper – print/office paper			
Glass	Local Honey Producers/ Pharmacy	25.0	All hotels do return specific glass bottles to the local brewery and distillery.

Moreover, sixty-two point five percent (62.5%) of hotels surveyed stated that there was a Sustainable Procurement Policy in place and that they utilized one or more of the following procurement strategies to reduce waste and costs:

- Priority procurement of resource efficient materials;
- Priority procurement of energy efficient equipment/supplies;
- Just-in-time delivery system; and
- Prevention of over-ordering.

One of the very first elements and most critical of the Resource Recovery hierarchy is the prevention of waste. As such, hotels utilizing the Sustainable Procurement policy correctly, reinforce this principle as the very first step in the sustainable procurement process is to re-think the need. That is, to determine whether the item is truly necessary or whether it can be eliminated altogether or replaced with a more sustainable alternative or contracted out for a service. Through sustainable procurement, consideration must be given to material attributes, vendor practices, and the impact of the product along the supply chain and in particular at its end-of-life.

[Photo Credit: Sustainable Purchasing at University of California]

While these concepts sound very promising in theory, in practice, seven (7) out of the eight (8) hotels still identified price, quality and availability as the most important criteria for procuring an item, in that order. Secondary considerations were the social and environmental aspects. As such, it does not appear that the environmental, social, and/or ethical considerations – which are fundamental components of sustainable
procurement – are being incorporated into the evaluation process for the purchasing of products for the hotel generally, and SUP specifically.

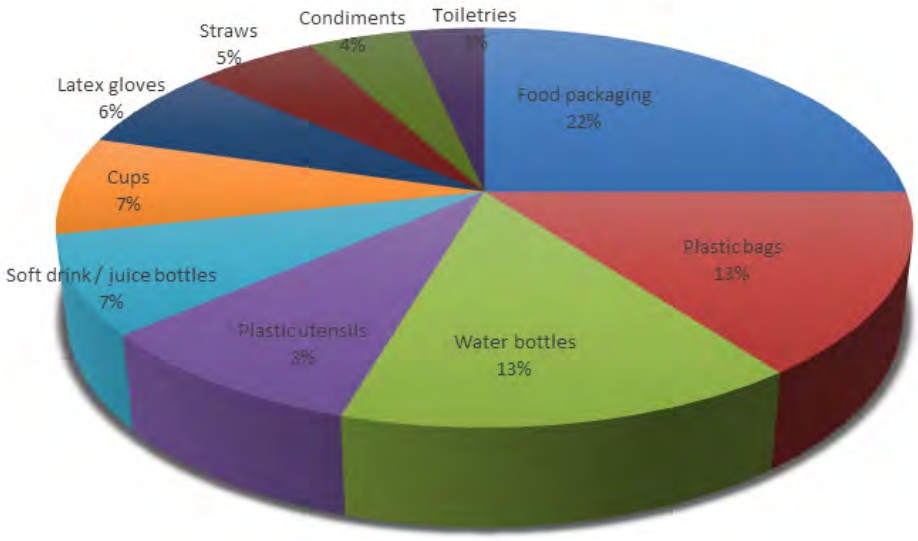
5.3 Challenges

Only two (2) hotels indicated challenges with the current waste management system, which related specifically to their respective waste haulers. However, the majority of hotels were neutral with regard to the overall waste management system, as it was felt that there was no real alternative due to the lack of Resource Recovery services for the diversion of recyclable material. Notwithstanding, seventy-five percent (75%) of hotels did indicate an interest and willingness to participate in the separation of recyclable material for recovery, should a system be put in place and the service made available. Moreover, a shared sentiment by most hotels was the need to make the relevant bins available for sorting as sourcing these were deemed expensive and difficult to locate. Additionally, as it related to sustainable procurement, budget constraints, time and limited information were stated as some of the key limitations in this regard.

VI. HOTEL SINGLE-USE PLASTICS ANALYSIS & RESULTS

A total of thirty-one (31) types of single-use items were identified during the waste audit (See ANNEX 2 for full list), amounting to seven thousand, three hundred and sixty-eight (7,368) individual pieces of plastic waste generated in 24 hours. However, the following top ten offenders accounted for 88% of all SUP. See Chart 2 below.

CHART 2: Percentage of Total SUP for Top 10 Items



At thirty-five point three percent (35.3%), food packaging and plastic bags combined represented the single largest proportion of SUP. That is, one thousand six hundred and twenty-one (1,621) food packaging items such as bags for ice, Ziplock bags, wrapping for meats, bags for rice etc. and nine hundred and seventy-seven (977) plastic bags, predominantly large garbage bags and grocery bags. Additionally, a total of eighteen point five kilograms (18.5 kg) of clear, plastic cling wrap was recorded.

Moreover, the results denoted that the back-of-house, hotel operations – particularly within the kitchen - was responsible for generating approximately forty-six point six percent (46.6%) of SUP waste within the top ten offenders list, from food packaging, plastic bags and latex gloves. While front-of-house, guest generated SUP waste within the top ten list accounted for thirteen point six percent (13.6%) from toiletries, straws and condiments. The remaining four (4) SUP waste types, that is, water bottles, juice bottles, cups and cutlery represented both staff and guest source generation and accounted for thirty-nine point eight percent (39.8%) of SUP waste within the top ten list.

Further statistical analysis was conducted to identify any significant relationships between total SUP and other independent variables captured in the surveys and waste audit. Similar to the total hotel waste, the ANOVA test was carried out to analyze the total SUP in relation to the previously identified fourteen (14) independent variables in section III. A sufficiently significant level of influence was observed by the independent variable, maximum occupancy on total SUP. All other independent variables failed to denote a significant level of influence on the dependent variable.

Moreover, a Correlation Analysis was performed to measure the strength of a relationship between a pair of variables, in this case, each waste stream and total SUP, and maximum occupancy and SUP. The correlation coefficient r varies between –1 and +1 where a perfect correlation is ±1, while 0 represents the absence of correlations. Only scores above 0.75 were considered significant.

A significant positive, linear relationship (strong correlation) was observed between total SUP and the following variables:

- Maximum occupancy – 0.91
- Tissue – 0.84
- Cardboard – 0.77

Lastly, a Simple Linear Regression Analysis was done to establish whether a correlation existed between the independent variable, total hotel waste, and the dependent variable, total SUP. However, this model did not explain sufficiently the variance as the score fell below the 75% threshold for significance.

It should be noted that a larger sample size would allow for a more robust statistical analysis to capture potentially salient relationships and allow for further exploratory testing.

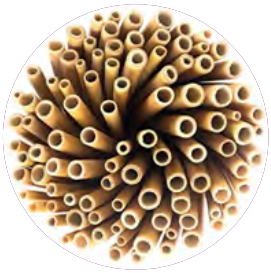
With regard to the total SUP waste generated per guest per day, this was calculated by dividing the total SUP waste collected by the occupancy during the waste audit period, which amounted to **11.4 pieces of SUP waste per guest per day**. The individual SUP generation per guest per hotel ranged from 4.3 pieces to 32.8 pieces, with two mid-sized hotels accounting for both the lowest and highest plastic waste generation rates respectively. Additionally, the average cling wrap waste generated was 2.3 kg per hotel. Interestingly, one mid-sized hotel with an occupancy of 86, has consistently ranked in the top tier of sampled hotels as the lowest total waste generator (92.4 kg), the lowest waste generation rate per guest per day at 1.1 kg/guest/day, the second lowest plastic waste generator at 376 items, the second lowest plastic waste generator per guest per day at 4.3 kg/guest/day and the second lowest cling wrap generator at 1.23 kg. It is clear that there are other factors at play and a larger sample would facilitate greater exploration. As it stands, the sample was too small to indicate whether any of the 14 independent variables listed earlier such as training and green certification were influencing the dependent variables total waste and total SUP.

VII. HOTEL SINGLE-USE PLASTICS MANAGEMENT

All participating hotels, one hundred percent (100%) were aware of the negative environmental impact of single-use plastics, while seventy-five percent (75%) were very concerned about the impact of SUP on their hotel. For three (3) hotels, concern manifested several years ago for a variety of reasons (e.g. economic and/or environmental benefits, business opportunity - market differentiation etc.) and steps were taken to reduce or completely eliminate the use of certain single-use plastics, in addition to the reduction of other waste streams. However, the recent introduction of the Styrofoam & Plastics Food Service Containers (prohibition) Act 2019, proved to be the necessary motivating factor for the remaining hotels to transition away from SUP and seek sustainable alternatives and/or their complete elimination.

7.1 Transitioning to Sustainable Alternatives

As such, seventy-five percent (75%) of hotels have replaced the SUP straws and takeaway containers with what are believed to be sustainable alternatives such as paper and compostable and/or bioplastic items. Additionally, eighty-eight percent (88%) of hotels have replaced and/or are in transition to replacing some of the following single-use plastic items noted in Table 4 below. While the intention to move towards more sustainable options is applauded, the execution appears to be somewhat problematic. Hotels are selecting alternative materials that are in fact not sustainable. For example, paper straws have been identified as an unsustainable alternative in several studies due to its production process that actually produces more Green House Gases (GHGs) than the conventional plastic straw (UNEP, 2017). Similarly with bamboo, if the plant is not used in its original form – like with straws where it is simply cut, steamed/boiled and packaged – the actual processing of bamboo to transform it to create other products is very resource intensive, requiring large amounts of water, energy and chemicals, (UNEP, 2017). It is very tempting to assume that a renewable, organic and natural alternative is automatically the best option.



Furthermore, when considering the end-of life component of plastic SUP alternatives such as oxo-biodegradable plastics (commonly referred to as biodegradable plastics) and bioplastics such as Polylactic Acid (PLA) which is compostable, the solid waste services available on island must be assessed. Biodegradable and compostable plastics must be properly disposed of, otherwise, they risk creating the same environmental issues as conventional plastics. As such, their environmental advantage over conventional plastics is questionable. Moreover, compostable bioplastics like PLA must be composted in an industrial composting facility under very high temperatures. Given that Saint Lucia does not have an industrial composting facility, introducing this material into the environment/landfill will do more harm than good. Part of the problem here is that these terms like "biodegradable" and "compostable" are understood by the general public to infer environmental benefit to the product at hand. It must be recognized that biodegradability and compostablity are only material properties, that is, they describe the material and how it behaves under specific conditions. They are NOT indicative of whether a material is environmentally friendly.

BIODEGRADABILITY AND COMPOSTABILITY ARE MATERIAL PROPERTIES. THEY ARE NOT INDICATIVE OF WHETHER A MATERIAL IS ENVIRONMENTALLY FRIENDLY.

Lastly, neither type of plastic alternative listed above should enter any recycling channel. Given that the Resource Recovery efforts by recyclers are in the early stages, diverting plastic SUP alternatives via recycling channels will contaminate the conventional plastics stock and create serious problems for the recycler.

Replacing a SUP with a single-use alternative should however be the last resort. According to the Resource Recovery hierarchy, eliminating the SUP in the first instance should be the goal. However, when this is not possible, a reusable alternative should be prioritized.

TABLE 4: Percentage of Hotels that have Replaced SUP

No. Stream	SUP Type	Alternative	% Hotels Engaged	Notes
1.	Water bottles	Reusable glass and/or aluminum bottles	66.7	Guest rooms furnished with glass bottles for water. One hotel has provided guests with branded Aluminum water bottles.
2.	Cups	Reusable plastic/ paper and/or glass	50	Welcome guest cocktails provided in reusable plastic cups or glassware. Staff and guest quarters stocked with non-breakable reusables.
3.	Plates	Reusable ceramic/ plastic/paper/bamboo	50	Non-breakable reusables primarily for staff quarters e.g. canteen.
4.	Cutlery	Reusable ceramic/ plastic/paper/bamboo	50	Silverware now used in the staff canteen. Other reusable alternatives primarily used for take-away.
5.	Toiletries	Refillable dispensers or larger bottles	16.7	One hotel has implemented this. Two other hotels are actively pursuing this option as well, though they are yet to transition.
6.	Bin liners	Compostable plastic or reusable cloth	50	--
7.	Shower Caps	Reusable cotton	16.7	--
8.	Laundry bags/ sacs	Reusable cloth/canvas	50	--

7.2 The Low Hanging Fruit

It should be noted that the SUP targeted by hotels for replacement or removal represent the low hanging fruit, that is, items which directly impact the guest experience, for the most part, and therefore provided added impetus for change. Cumulatively, these SUP items represented 31% of the total SUP waste. While there is room for improvement in catalyzing the uptake of alternatives to replace SUPs among more hotels, the **following barriers to procuring these alternatives were identified: high cost, limited options and a lack of information on suitable alternatives.** Given that only twenty-five percent (25%) of hotels stated that it was "difficult" to source environmentally friendly alternatives to SUP, an opportunity exists to address these barriers and facilitate the increase in, and speed at which, hotels move away from SUP.

However, it was clear that hotels were unwilling to push for an alternative or complete elimination of SUP if it became clear that guests would react poorly. Some preliminary research conducted by the Hilton Hotels denoted variances between what guests say they want versus what they actually do when traveling. While sixty percent (60%) stated that a hotel's social and environmental efforts would influence their booking decisions, only one third actually researched these efforts before booking, (Skift, 2019).

While many travelers are committed to sustainability, others are on their worst behaviour in the name of convenience and carefree relaxation, adopting unsustainable habits to enjoy the perceived value of their hotel amenities, (Skift, 2019). That being said, hotels must be willing to use these instances as learning opportunities, to be the educators and inform guests about the environmental policies they have adopted and their importance to the hotel and the island.

Furthermore, it was recognized that in order to achieve an even greater impact in the reduction/elimination of SUP within hotels, hoteliers must be willing to tackle food packaging, plastic bags and cling wrap. These items are predominantly used within the kitchen (back-of-house) and are generally approached in a more passive manner. While it was widely acknowledged that many SUP were used in the kitchen pre and post food preparation, hoteliers lamented the challenge to find suitable and affordable alternatives that respected the HACCAP requirements for food handling and food safety, which all hotels follow. This represented one area where expert guidance and information was needed by hotels.

VIII. CONCLUSION– CATALYZING THE UPTAKE

With the metrics from this waste study in hand, hotels are now more empowered to take action. The five (5) hotels interviewed expressed much gratitude in having the waste audits done, as they now had for the first time actual, empirical data to inform decision-making as it related to solid waste management on property. While the results were mixed due to the small sample size, it was clear that there was a strong, positive relationship between MAXIMUM HOTEL OCCUPANCY and TOTAL SUP. However, the data also revealed that when a hotel is operating below this maximum capacity, there are other variables that impact the strength of this relationship. As such, replicating this study with additional hotels to increase the sample size, while also targeting different times of the year (low season vs. high season) would provide the additional data points required to reduce the margin of error and produce more statistically significant results.

That being said, the audit results did show that the back-of-house activities namely within the kitchen and maintenance departments, were responsible for thirty-five point three percent (35.3%) of SUP waste generation, namely food packaging and plastic bags. With regard to plastic bags, some hotels used reusable plastic bags to handle green waste on property; however, the use of plastic garbage bags could only be reduced with the reduction in hotel waste overall. Further investigation was required to identify the source of the plastic shopping bags to determine whether they were being brought onto the property by staff and/or suppliers with goods. Once this has been identified then appropriate measures can be taken.

Food packaging represented a great challenge for many hotels. While some packaging was eliminated with bulk purchasing, a recommendation was made to work with local suppliers to change the packaging for the delivery of certain items such as produce. However, finding alternatives to the SUP plastic such as Cling Wrap for pre- and post-food prep remained a challenge. Hotels have requested assistance on this front for alternatives that will respect their food handling and health and safety requirements.

While some properties were further ahead than others in the implementation of waste reduction policies, and the transition to SUP elimination and alternatives, actions appeared to be disjointed due to the lack of clear sustainability policies to ground the hotels' direction in charting this changing global environment. Fifty-seven percent (57%) of hotels did not have a sustainability policy. Isolated SUP reduction/elimination practices that are not tied to a broader programme or mandate may be viewed as greenwashing by guests who are becoming increasingly environmentally aware.

Photo Credit: [St. Lucia Tourism Media - Pigeon Island : www.expedia.ca/St-Lucia.d601900.Destination-Travel-Guides]

Furthermore, the lack of expertise and readily available information on appropriate alternatives appeared to be a challenge as some hotels have transitioned to unsustainable SUP alternatives such as paper straws and compostable bin liners. This also tied into the recognition that although sixty-two point five percent (62.5%) of hotels have a Sustainable Procurement Policy, it remains unclear as to whether it is being used correctly. If life-cycle assessments were being conducted on products prior to purchasing, these issues of sustainability and suitability for the Saint Lucian context would have been flagged prior to purchasing. Therefore, additional training in Sustainable Procurement is highly recommended, as well as the provision of information and expertise on SUP alternatives.

Lastly, this study has revealed that guidance is required for hotels in order to create a more holistic, systematic and impactful approach towards achieving the waste reduction targets identified from the onset, and to assist in catalyzing efforts towards building a culture of sustainability among them. Based on the issues, challenges, and successes identified during the waste study, the following 8-step Pathway to Action was developed for hotels. These steps included:

1. **[Re]-define your hotel product** – hotels that were most successful in implementing SUP reduction measures were guided by a sustainability policy which shared the hotel's mission and commitments to sustainability, environmentalism, waste reduction etc.;

2. **A Governance Structure** – Specific staff(either an individual or a team) were given responsibility to oversee the implementation of waste reduction measures;

3. **Staff & Guest Engagement** – All staff were engaged, not only for implementation but also in the creation of solutions as they had the first-hand experience of what could work and what would not in their specific department. They also served as the first point of contact with guests and therefore need to be trained so as to educate the guests adequately;

4. **Conduct a Baseline** – It is imperative to know how much waste the hotel is generating and the sources of this waste in order to make informed decisions to move forward;

5. **Develop an Action Plan** - Once all necessary data has been collected, only then can the hotel determine what the best course of action is to meet its targets and start creating change;

6. **Implement** – Here, the focus is on procurement as this is the entry point for all products coming into the property. Sustainable procurement practices must be used and used correctly to ensure sustainable and appropriate options are selected;

7. **Monitor & Evaluate** – In order to quantify the change, metrics must be recorded at regular intervals to ensure the hotel remains on stream for meeting their respective targets;

8. **Share successes** – Both the current and future guests benefit from learning about the initiatives being implemented by the hotel given the changing traveler profile. However, experiences and insights should also be shared with other hotels; time and money can be saved by learning what worked and what did not for your fellow hoteliers.

These steps will be further elaborated in the Recommendations & Best Practices Toolkit, so as to catalyze the uptake among all hotels in Saint Lucia towards adopting measures necessary to move towards sustainability and SUP elimination.

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ANNEX 1 –SURVEY TEMPLATES

This survey has been developed by JUA KALI LTD. to support the implementation of a Waste Management Assessment of hotels in Saint Lucia,towards improving their capacity to phase out single-use plastics and introduce sustainable procurement and eco-innovation solutions.

This falls under the project, **"Transforming Tourism Value Chains in Developing Countries and Small Island Developing States (SIDS) to accelerate more resource efficient, low carbon development"**, led by the UN Environment. The main objectives of this survey are to:

- Assess the waste management system of hotels;
- Create a baseline on waste production by hotels and in particular, single-use plastics;
- Assess the procurement process of hotels; and
- Understand the main barriers and opportunities for the phasing out of single-use plastics in the Accommodations Services Industry (hotels).

The completion of this survey should take approximately 30 minutes. All data is stored in a password protected electronic format. To help protect your confidentiality, the surveys will not contain information that will personally identify you. The information gathered will remain confidential and will be only shared with project partners and stakeholders.

*** All questions are mandatory.**

DEFINITIONS:

Single-use Plastics – Also called disposable plastics, refer to plastics that are used only once before they are disposed of. These items include: plastic bags, straws, coffee stirrers, soft-drink and water bottles and most food packaging.

START HERE

TELL US ABOUT THE HOTEL:

1. In what year was the hotel established? _____

2. State the number of years that the hotel has been continuously operational i.e. not closed for more than 1 year: _____

3. Number of rooms: _____

4. Maximum occupancy: _____

5. Average hotel occupancy: _____

   Peak Season (December 15th - March 31st): _____

   Mid Season (October 1st – December 14th): _____

   Low season (April 1st – September 30th): _____

6. Select the relevant hotel classifications (tick all that apply to the hotel):

Luxury	All-inclusive	All-inclusive Option	Full Board	Half Board	A La Carte	Self-catering	Star Rating				
							5	4	3	2	1

7. Select the facilities/amenities provided by the hotel and indicate the quantity:

	Restaurant(s)	Pool(s)	Fitness centre	Spa	Dive Shop	Water Sports	Business Centre	Conference	Kids Playground / Game Room	Garden
Yes										
No										
Number										

* Other (please identify):

_____

_____

_____

8. Select the relevant target audience that your hotel caters to (tick all that apply):

Couples	Adults	Business	Families	Kids 12 years old and over	Kids under 12 years old

9. Select the top three country/region markets that supply the hotel guests:

United States	Canada	Europe	Asia (China, Japan etc.)	South-east Asia (Singapore, Philippines etc.)	Australia	Latin America	Caribbean (regional)

TELL US ABOUT THE HOTEL'S WASTE MANAGEMENT SYSTEM:

10. Does the hotel have a Waste Management Plan?

    YES _____ NO _____

11. Which collection service(s) does the hotel utilize? (circle one that applies)

    PRIVATE / PUBLIC

Please provide name(s) and contact information for the hotel Waste Hauler:

Company Name	Tel No.	Email	Waste Type	Collection Frequency Daily – D Weekly - W 2x weekly – 2W 3x weekly - 3W Monthly – M Other - O

OTHER (please describe) _____

12. Does the hotel receive a summary report or other feedback from the Waste Hauler regarding the amount of waste that is disposed?

YES _____ NO _____

If YES, please specify the type of information received:

_____

_____

_____

_____

13. What is the criteria used to determine the payment for waste disposal services?

☐ FLAT RATE ☐ WEIGHT ☐ VOLUME ☐ TRIPS

14. Is the hotel satisfied with the level of service provided by the Waste Hauler?

Very satisfied _____ Satisfied _____ Neutral _____ Not Satisfied _____

Please explain:

_____

_____

_____

_____

15. How is waste stored prior to collection from the hotel premises?

i. In metal/plastic bins

ii. In skips bins

iii. In compactors

iv. In roll-on-roll-off bins

v. Other

16. Please describe the designated storage areas for the waste collected on property.

_____

_____

_____

_____

17. Are there any issues/challenges with the current waste management system?

YES _____ NO _____

Please describe:

Issue 1: _____

Issue 2: _____

Issue 3: _____

18. Does the hotel have designated staff /department responsible for all waste management on property?

YES _____ NO _____

Who is responsible (title of officer): _____

What department is responsible: _____

19. What is the main role/responsibilities of this staff/department as per the terms of reference?

- _____
- _____
- _____
- _____
- _____

TELL US ABOUT THE HOTEL'S ENVIRONMENTAL INITIATIVES, PROGRAMS, AND POLICIES:

20. Does the hotel have a documented Sustainability Management System or an Environmental Management System?

YES _____ NO _____

a. If YES, please indicate when this system was put in place: _____

b. What were the motivating factors for the establishment of this system? Please tick all that apply:

An EMS needed to be in place in order to obtain an environmental certification	
The EMS guides the organization in making more environmental/sustainable decisions.	
The EMS helps the organization save money.	
The EMS helps the organization save money.	

c. If NO, please indicate the 3 main reasons why this has not been established:

1) _____

2) _____

3) _____

21. Does the hotel have an Environmental or Sustainability Strategy?

YES _____ NO _____

22. Does the hotel have an Environmental Manager?

YES _____ NO _____

If YES, what is the main role/responsibilities of this officer as per the terms of reference?

- _____
- _____
- _____
- _____
- _____

23. Does the hotel communicate with its stakeholders (i.e. guests, suppliers, government agencies etc.) about its environmental initiatives?
YES _____ NO _____

If YES, what communication channels are used? (Please tick all that apply)

Social Media	TV	Radio	World Wide Web	Company web-site	Company web-site	Quarterly / Annual Reports	Other (please indicate)

24. Does the hotel's operations respect the environment within which it operates?

YES _____ NO _____

If YES, how? (Please give examples):

_____

_____

_____

25. Does the hotel support any environmental initiatives/activities within the sur rounding community, district or island?

YES _____ NO _____

If YES, how? (Please give examples):

_____

_____

_____

26. Does the hotel have any environmental accreditations/certifications?

YES _____ NO _____

If YES, how? (Please give examples):

_____

27. Does the hotel have any environmental accreditations/certifications?

YES _____ NO _____

28. Please indicate the hotel's level of concern regarding single-use plastics on property:

Very Concerned	Concerned	Little Concern	No Concern

29. Please list the steps the hotel has taken to address single-use plastics on property:

I. _____

II. _____

III. _____

IV. _____

V. _____

30. How would you rate the hotel's interest in Recycling?

HIGH	MODERATE	LOW	NON-EXISTENT

31. Has the hotel implemented any measures to eliminate certain types of waste and/or minimize waste altogether? Please indicate the type of material and the corresponding action/measure taken in the box below:

YES _____ NO _____

MATERIAL	ACTIONS TAKEN
Plastics	
Glass	
Paper	
Cardboard	
Metal	
Food scraps	
Green waste	
Construction & Demolition	
Electronic Waste	
Appliances	

24. Does the hotel experience challenges in adopting/executing these measures/ actions?

YES _____ NO _____

If YES, please state what are the challenges faced:

Challenge 1: _____

Challenge 2: _____

Challenge 3: _____

Challenge 4: _____

Challenge 5: _____

THANK YOU FOR YOUR TIME.

QUESTIONNAIRE – PROCUREMENT MANAGER

This survey has been developed by JUA KALI LTD. to support the implementation of a Waste Management Assessment of hotels in Saint Lucia,towards improving their capacity to phase out single-use plastics and introduce sustainable procurement and eco-innovation solutions.

This falls under the project, **"Transforming Tourism Value Chains in Developing Countries and Small Island Developing States (SIDS) to accelerate more resource efficient, low carbon development"**, led by the UN Environment. The main objectives of this survey are to:

- Assess the waste management system of hotels;
- Create a baseline on waste production by hotels and in particular, single-use plastics;
- Assess the procurement process of hotels; and
- Understand the main barriers and opportunities for the phasing out of single-use plastics in the Accommodations Services Industry (hotels).

The completion of this survey should take between 30 minutes to 1 hour as data is required. All information provided is stored in a password protected electronic format. To help protect your confidentiality, the surveys will not contain information that will personally identify you. The information gathered will remain confidential and will be only shared with project partners and stakeholders.

*** All questions are mandatory.**

DEFINITIONS:

Single-use Plastics – Also called disposable plastics, refer to plastics that are used only once before they are disposed of. These items include: plastic bags, straws, coffee stirrers, soft-drink and water bottles and most food packaging.

Sustainable Procurement – A process by which environmental, social and ethical considerations are taken into account when making a purchasing decision. In a nutshell, it is buying better products and services from better companies that are better for everyone.

Environmental Aspects – Criteria used to assess a product re: procurement, which includes:

- Energy and water efficiency, waste water;
- Use of recycled content;
- Re-usable packaging;
- Use of sustainably sourced materials (e.g. certified timber, construction materials etc.); and
- Eco-label or equivalent performance standards.

Social Aspects – Criteria used to assess a manufacturer/supplier re: procurement, which includes:

- Avoidance of substances hazardous to health in manufacture use;
- Training requirements;
- Fair Trade practices; and
- Labour requirements (wages, working hours, conditions etc.).

START HERE

1. Does the hotel have a Sustainable Procurement Policy* (SPP) in place? See above for definition:

   YES _____ NO _____ NOT SURE _____

   Please explain the rationale:

   _____

   _____

   _____

2. Does the Hotel utilize any of the following procurement strategies to minimize waste on property?

   YES _____ NO _____

   Please tick all that apply:

   - ☐ Priority procurement of resource efficient materials
   - ☐ Priority procurement of energy efficient equipment/supplies
   - ☐ Minimally packaged products
   - ☐ Just-in-time delivery system
   - ☐ Prevention of over-ordering
   - ☐ Other (specify) _____

3. On a scale of 1-4, where 1 is the most important and 4 is least important, please rank the following criteria for procuring items:

	1	2	3	4
i. Price	☐	☐	☐	☐
ii. Quality	☐	☐	☐	☐
iii. Environmental Aspects*	☐	☐	☐	☐
iv. Availability	☐	☐	☐	☐
v. Social Aspects*	☐	☐	☐	☐

4. How would you rate the ability to source environmentally friendly products?

   ☐ Easy ☐ Moderate ☐ No Issue ☐ Difficult ☐ Very Difficult

   Please explain the rationale:

5. Are there any barriers for purchasing environmentally friendly products?

   YES _____ NO _____

6. If yes, what are some of the barriers for purchasing environmentally and socially sustainable products?

   ☐ High costs

   ☐ Limited choices/options

   ☐ Lack of information

   ☐ Unavailability

   ☐ No interest

   ☐ Other (Please list):

   _____

   _____

   _____

7. Does the hotel actively seek to engage local suppliers in preference to outside (regional or international) suppliers?

   YES _____ NO _____

   Please explain rationale:

   _____

   _____

   _____

8. Is there a general awareness by the hotel of the negative impact of single-use plastics?

   YES _____ NO _____

9. Please indicate the hotel's level of concern regarding single-use plastics on property:

Very Concerned	Concerned	Little Concern	No Concern

10. Please list the steps the hotel has taken to address single-use plastics on property:

I. _____

II. _____

III. _____

IV. _____

V. _____

11. Does the hotel buy any alternative to single-use plastic products? Please tick all that apply:

ITEM	YES	NO
Sustainable paper/cardboard/bamboo straws		
Wooden/bamboo tooth brush		
Wooden/bamboo hair brush		
Biodegradable cups and cutlery		
Paper plates		
Sustainable paper/cardboard food packaging		
Compostable bin liners		
Shampoo & conditioner bars		
Sustainable cotton shower hat		
Other, please specify:		

12. How often does the hotel purchase any of these alternatives to single-use plastic products (e.g. 100 bamboo straws monthly)? *

11. Does the hotel buy any alternative to single-use plastic products? Please tick all that apply:

Products	Quantity	Weekly	Quantity	Fortnightly	Quantity	Monthly	Quantity	Quarterly
Sustainable paper/ cardboard/ bamboo straws								
Wooden / bamboo tooth brush								
Wooden / bamboo hair brush								
Biodegrad-able cups and cutlery								
Paper plates								
Sustainable paper/ cardboard food packaging								
Compostable bin liners								
Shampoo & conditioner bars								
Sustainable cotton shower hat								
Other								

13. What are the sources of supply of these products (i.e. Supplier A for bamboo straws & bamboo cutlery, supplier B for compostable bin liners, etc.)?

PRODUCT	SUPPLIER		
	LOCAL	REGIONAL	INTERNATIONAL
Sustainable paper/cardboard/ bamboo straws			
Sustainable paper/cardboard/ bamboo straws			
Wooden/bamboo hair brush			
Biodegradable cups and cutlery			
Paper plates			
Sustainable paper/cardboard food packaging			
Compostable bin liners			
Shampoo & conditioner bars			
Sustainable cotton shower hat			
Sustainable cotton shower hat			

14. For each of the items specified in 12 above, please indicate the cost per unit:

PRODUCT	COST PER UNIT (XCD)
Sustainable paper/cardboard/bamboo straws	
Wooden/bamboo tooth brush	
Wooden/bamboo hair brush	
Biodegradable cups and cutlery	
Paper plates	
Sustainable paper/cardboard food packaging	
Compostable bin liners	
Shampoo & conditioner bars	
Sustainable cotton shower hat	
Other, please specify:	

THANK YOU FOR YOUR TIME.

QUESTIONNAIRE – DEPARTMENT HEAD

This survey has been developed by JUA KALI LTD. to support the implementation of a Waste Management Assessment of hotels in Saint Lucia,towards improving their capacity to phase out single-use plastics and introduce sustainable procurement and eco-innovation solutions.

This falls under the project, "**Transforming Tourism Value Chains in Developing Countries and Small Island Developing States (SIDS) to accelerate more resource efficient, low carbon development"**, led by the UN Environment. The main objectives of this survey are to:

- Assess the waste management system of hotels;

- Create a baseline on waste production by hotels and in particular, single-use plastics;

- Assess the procurement process of hotels; and

- Understand the main barriers and opportunities for the phasing out of sin gle-use plastics in the Accommodations Services Industry (hotels).

The completion of this survey should take approximately 30 minutes. All data is stored in a password protected electronic format. To help protect your confidentiality, the surveys will not contain information that will personally identify you. The information gathered will remain confidential and will be only shared with project partners and stakeholders.

*** All questions are mandatory.**

DEFINITIONS:

Single-use Plastics – Also called disposable plastics, refer to plastics that are used only once before they are disposed of. These items include: plastic bags, straws, coffee stirrers, soft-drink and water bottles and most food packaging.

START HERE

Department: _____

1. Please state the main role and responsibilities of the Department

   - _____
   - _____
   - _____
   - _____
   - _____

2. How many staff work within this department? _____

3. Is there a specific staff within the department responsible for waste management?

   YES ____ NO____ (skip to Q.5)

   If YES, please state the number of staff with this responsibility: _____

4. Please state the title of this staff and list the main responsibilities related to the waste management:

   Title _____

5. Please state the title of this staff and list the main responsibilities related to the waste management:

   Title _____

   Responsibilities _____

   _____

6. How is waste managed by the Department? Please describe in detail the steps followed, number and type of receptacles used etc.:

   _____

   _____

   _____

7. Is the waste separated into categories such as organics (food scraps, leaves, branches, and flowers), plastics, glass bottles, hazardous materials, cardboard, paper, metals etc?

YES ____ NO ____

If YES, please list the categories into which the waste is separated:

- _____
- _____
- _____
- _____
- _____

8. How is each category of waste listed above prepared for disposal? Please describe in detail:

- _____
- _____
- _____
- _____
- _____

9. Do you handle any hazardous waste (chemicals, fluorescent lamps, batteries, etc.)?

YES ____ NO ____ (please skip to Q.9)

IF YES, please list the hazardous materials handled:

_____

10. How are these hazardous materials disposed of?

_____

11. How is food waste disposed of?

- ☐ Thrown with regular garbage
- ☐ Collected by individuals e.g. pig farmers
- ☐ Composted by hotel
- ☐ Other (specify) _____

12. Please rate your level of satisfaction with the current waste management process for your Department:

____Very satisfied ____Satisfied ____Neutral

____Dissatisfied ____Very Dissatisfied

Explain the rationale: _____

_____

_____

_____

13. Please describe the top 3 challenges/barriers to the waste management process?

i. _____
ii. _____
iii. _____

14. Is there any concern within the Department about the amount of single-use plastic waste being generated?

YES ____ NO____

15. List the top five single-use plastic items that are most frequently discarded in the garbage by your Department (e.g. plastic water bottle):

i. _____
ii. _____
iii. _____
iv. _____
v. _____

16. Have measures been put in place to reduce the amount of single-use plastic items used?

YES _____ NO _____

If YES, briefly describe these measures:

_____

_____

_____

_____

17. Please rate the general level of awareness (choose one per issue) and perception of importance (choose one per issue) by staff on the following environmental issues:

	LEVEL OF AWARENESS			PERCEPTION OF IMPORTANCE			
ISSUE	VERY AWARE	SOMEWHAT AWARE	NOT AWARE	VERY IMPORTANT	SOMEWHAT IMPORTANT	NEUTRAL	DOES NOT CARE
Littering							
Climate Change							
Single-use plastics							
Recycling							
Waste Management							
Waste Diversion							

_____

_____

18. Does the Department participate in or undertake any training/activity to educate staff on environmental issues?

YES _____ NO _____

If YES, how often are the trainings/activities undertaken?

_____

19. Are these trainings/activities considered adequate?

YES _____ NO _____

ANNEX 2 - MASTER LIST OF HOTELS

#	NAME	#	NAME
1	Bay Gardens Beach Resort	22	Bay Gardens Marina Haven
2	Bay Gardens Hotel	23	Bel Jou Hotel
3	The BodyHoliday Le Sport Saint Lucia	24	Boucan by Hotel Chocolat
4	Coco Palm Hotel	25	Calabash Cove
5	Coconut Bay Beach Resort & Spa	26	Cap Maison
6	Harbor Club	27	East Winds Inn
7	Marigot Bay Resort Spa & Marina	28	Fond Doux Plantation
8	Mystique Royal Saint Lucia Resort & Spa	29	Fox Grove Inn
9	Rendezvous Hotel	30	Ginger Lilly
10	Royalton St Lucia Resort & Spa	31	Habitat Terrace Hotel
11	Sandals Grande St. Lucia Beach Resorts & Spa	32	Harmony Suites
12	Sandals Halcyon Beach Resort	33	Hummingbird Beach Resort
13	Sandals Regency La Toc	34	Jade Mountain
14	St. James's Club, Morgan Bay	35	JJ's Paradise
15	Starfish St Lucia	36	La Haut Plantation
16	Sugar Beach (Jalouise)	37	Ladera Hotel
17	The Landings St. Lucia Resort & Spa	38	Marigot Beach Club Hotel
18	Windjammer Landing	39	Serenity at Coconut Bay
19	Anse Chastanet Hotel	40	Stonefield Villa Resort
20	Auberge Seraphine Hotel	41	The Downtown Hotel
21	Bay Gardens Inn	42	Ti Kaye Village

ANNEX 3 - PLASTICS LIST FROM WASTE

#	SINGLE-USE PLASTICS	COUNT	#	SINGLE-USE PLASTICS	COUNT
1	Packaging of Food Items	1621	17	Mini alcohol bottles	39
2	Plastic Bags	977	18	Coffee filters	27
3	Water Bottles	976	19	Contact lenses	25
4	Plastic Utensils	560	20	Plastic plates	19
5	Soft Drink Bottles	542	21	Cup lid	18
6	Plastic Cups	531	22	Soap	17
7	Latex Gloves	410	23	Plastic apron	10
8	Straw	358	24	Detergent packs	6
9	Condiments	317	25	Tea bag wrapper	5
10	Toiletries	208	26	Toothbrush	5
11	Plastic Toilet Paper Wrapper	205	27	Floss	4
12	Non-Food Packaging	142	28	Toothpaste	2
13	Yogurt Cup	129	34	Shower cap	1
14	Sanitary Pad and Tampon Wrappers / Applicators	112	30	Mouthwash	1
15	Earbud	58	31	Cigar case	1
16	Coffee Pack	42			

WASTE STUDY

Singe-Use Plastics within the Accommodation Services Industry in Saint Lucia

This Waste Study was undertaken to establish a baseline of plastic procurement and use by hotels, and their waste management and disposal practices, so that Hoteliers and the Accommodation Services Industry in Saint Lucia could have a better understanding of their plastic footprint and begin addressing this issue.

Prepared by: **JUA KALI LTD**.
Desktop Publishing: **Mishaél Fabien | MitchelLyons**

This Waste Study is one component of a broader project entitled:
Phasing Out of Single-use Plastics - Towards Clean Seas & Sustainable Tourism in the Caribbean.

Commissioned by the
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Sans Souci, Castries
SAINT LUCIA

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