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Secretariat of the Pacific Regional Environment Programme

PacWastePlus
PACIFIC WASTE MANAGEMENT

This initiative is supported by **PacWastePlus**-a 85-month project funded by the European Union (**EU**) and implemented by the Secretariat of the Pacific Regional Environment Programme (**SPREP**) **to sustainably and cost effectively improve regional management of waste and pollution.**

*This has been produced with assistance from the **European Union**. Its contents are the sole responsibility of **SPREP** and do not necessarily reflect the views of the European Union.*

Vanuatu National Waste Audit Analysis Report

June 2025

This Waste data collation, analysis and reporting for the Vanuatu National Waste Audit Analysis Report was guided by the overarching Regional Waste Data Collection, Monitoring, and Reporting (DCMR) Framework for the Pacific Island Countries and Territories (PICT).

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PO Box 240
Apia, Samoa
T: +685 21929
E: sprep@sprep.org
W: www.sprep.org

Our vision: A resilient Pacific environment sustaining our livelihoods and natural heritage in harmony with our cultures.

PacWaste Plus Programme

The Pacific – European Union (EU) Waste Management Programme, PacWaste Plus, is a 72-month programme funded by the EU and implemented by the Secretariat of the Pacific Regional Environment Programme (SPREP) to improve regional management of waste and pollution sustainably and cost-effectively.

About PacWaste Plus

The impact of waste and pollution is taking its toll on the health of communities, degrading natural ecosystems, threatening food security, impeding resilience to climate change, and adversely impacting social and economic development of countries in the region.

The PacWaste Plus programme is generating improved economic, social, health, and environmental benefits by enhancing existing activities and building capacity and sustainability into waste management practices for all participating countries.

Countries participating in the PacWaste Plus programme are: *Cook Islands, Democratic Republic of Timor-Leste, Federated States of Micronesia, Fiji, Kiribati, Nauru, Niue, Palau, Papua New Guinea, Republic of Marshall Islands, Samoa, Solomon Islands, Tonga, Tuvalu, Vanuatu*.

Key Objectives

Outcomes & Key Result Areas

The overall objective of PacWastePlus is "*to generate improved economic, social, health and environmental benefits arising from stronger regional economic integration and the sustainable management of natural resources and the environment*".

The specific objective is "*to ensure the safe and sustainable management of waste with due regard for the conservation of biodiversity, health and wellbeing of Pacific Island communities and climate change mitigation and adaptation requirements*".

Key Result Areas

- **Improved** data collection, information sharing, and education awareness
- **Policy & Regulation** - Policies and regulatory frameworks developed and implemented.
- **Best Practices** - Enhanced private sector engagement and infrastructure development implemented
- **Human Capacity** - Enhanced human capacity

Learn more about the PacWaste Plus programme by visiting

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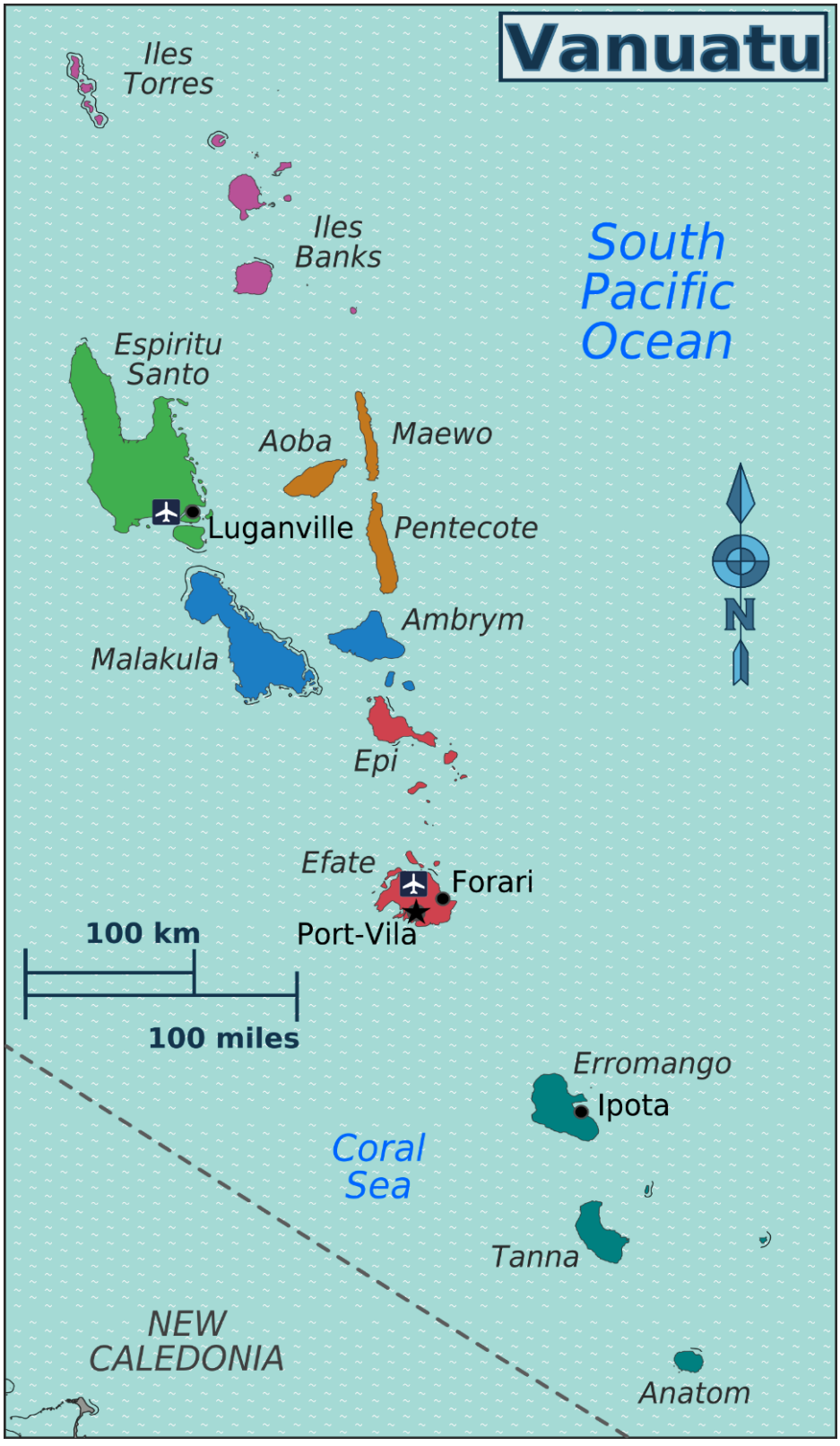
PacWastePlus PACIFIC WASTE MANAGEMENT

www.pacwasteplus.org

Table of Contents

Map of Vanuatu



Province Legend
Torba
Sanma (Luganville)
Penama
Malampa
Shefa (Port-Vila)
Tafea

Source: wikimedia.org/wikipedia/commons/3/36/Vanuatu_Regions_map.png

Glossary

Acronym	Definition
C&D	Construction and Demolition (Waste)
C&I	Commercial and Industrial (Waste)
DCMR	Data Strategy & Collection, Monitoring, and Reporting (Framework)
DEPC	Department of Environment Protection and Conservation (Vanuatu)
KPI	Key Performance Indicator
MEA	Multilateral Environmental Agreement
MSW	Municipal Solid Waste (i.e., waste originating from the general public that is typically managed by local government entities, excludes commercial / business waste)
NGO	Non-Governmental Organisation
PICT	Pacific Island Countries & Territories
PRIF	Pacific Regional Infrastructure Facility
SPREP	Secretariat of The Pacific Regional Environment Programme

Terminology	Definition
Capacity	The total maximum waste storage and processing that can take place at a facility (as capped by license conditions).
Capture rate	The proportion of total waste generated that is successfully captured and disposed or recovered in an environmentally responsible manner (e.g., by a formal collection service or self-hauled to a licensed facility)
Coverage	The proportion of total households that have access to a regular waste collection service.
Modern	A 'modern' facility employs 'sound waste management practices' (as defined by the UNEP) and results in minimal adverse impacts on the environment. A 'modern' facility must be licensed, staffed, have access to equipment and machinery such as a bulldozer, employ a leachate management system and implement a daily cover routine at a landfill, and must not be exceeding their maximum storage capacity.
Per capita	Units measured on a per person basis (i.e., to allow for extrapolation over a national population).
Recovery	Any activity that diverts waste material from landfill, including processing of dry recyclables (such as paper, cardboard, metal and plastics such as PET and HDPE), organics recovery, and energy recovery.
Unregulated	Typically, unlicensed waste facilities which do not follow international frameworks, rules, and guidelines to protect the health of the environment and community.
Waste facility	'Waste facilities' involved in the handling, disposal, or recovery of waste streams above a minimum processing threshold determined on country basis (i.e., tonnes of waste received per year). Can include landfills or dumpsites (that primarily rely on burying waste in a controlled manner), recycling facilities for dry recyclables, organics recovery facilities, and waste-to-energy facilities. Incinerators are not included in this analysis.

Executive Summary

Waste data collation, analysis and reporting for the Vanuatu National Waste Audit Analysis Report was guided by the overarching Regional Waste Data Collection, Monitoring, and Reporting (DCMR) Framework for the Pacific Island Countries and Territories (PICT).

The implementation of the DCMR Framework ensures that waste data is collected, analysed, and reported in a consistent and reliable way across the Pacific.

Table (a) Summary of Key Performance Indicators (KPIs) for Vanuatu

Core KPIs	Result	Supplementary KPIs	Result
1. Count / capacity of modern waste facilities	1 / Capacity Unknown	1. Cost of disposal to landfill ($/annum)	US$30.10
2. Count / capacity of unregulated waste facilities	5 / Projected capacity for Bouffa (423,000 m3)	2. Weight of waste disposed (tpa)	21,346
3. National recovery rate (%)	11.66%	3. Weight of waste recovered (tpa)	656
4. Per capita waste generation rate (kg/capita/year)	124.38	4. Volume of stockpiled hazardous waste (m3)	Asbestos:0 E-waste 6.70 Healthcare and pharmaceutical:0 Used oil 300 Used tyres:0 Obsolete chemicals:0 Others:0
5. MSW Composition (%)	Figure (a)	5. Marine plastic pollution potential (tpa)	155.39
6. Household waste capture rate (%)	88%	6. Awareness and support of waste management services (%)	47%
7. Household collection service coverage (%)	75%	7. Proportion of strategic waste management initiatives implemented (%)	74%
8. Fulfillment of MEA reporting requirements (%)	44%	8. Commercial waste capture rate (%)	100%
		9. Commercial collection service coverage (%)	100%
		10. Total weight of disaster waste disposed (tpa)	No data

Note: 'No data' indicates that the audit did not capture the parameters / measurements necessary to calculate the KPI.

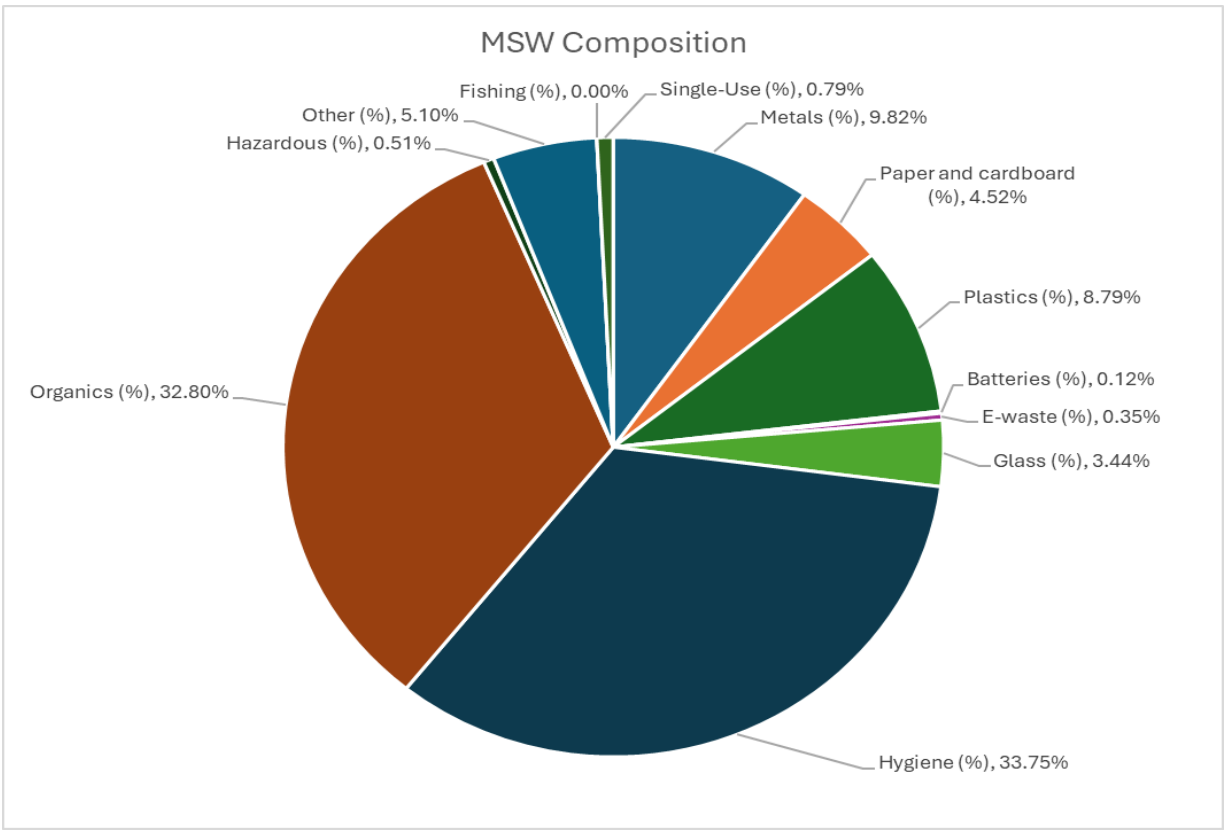


Figure (a) Municipal Solid Waste (MSW) Com position (% by weight)

1 Introduction

1.1 Background

Vanuatu is one of fifteen Pacific Island Nations which took part in the PacWastePlus Programme implemented through SPREP and funded by the European Union Delegation of the Pacific. PacWastePlus aims to improve waste management activities across the islands and strengthen the capacity of Governments, industries, and communities to manage wastes to protect human health and the environment.

In Vanuatu, waste recovery is conducted by RecycleCorp, a private company that collects various recyclable materials, including aluminium cans, glass, scrap metal, batteries, and e-waste. Operating in both Port Vila and Luganville, RecycleCorp actively collaborates with waste pickers at landfills and provides 240-litre mobile garbage bins to commercial premises for a fee. RecycleCorp consolidates and exports recyclable waste, maintaining stockpiles in both the Port Vila and Luganville facilities.

In addition, private companies such as Azure Pure Water and Vanuatu Brew encourage bottle returns by offering a 5-10 VUV redemption. The recycling sector in Vanuatu is expanding following contributions from the PacWaste Plus programme and the contributions of industry bodies like the Vanuatu Recyclers and Waste Management Association.

Vanuatu's overall waste management practices are limited and primarily rely on burying, burning, dumping, and landfilling. There is limited access to proper waste collection and disposal facilities, leading to environmental degradation and health hazards. The country requires investment in infrastructure, implementation of data-guided decision making, and increased general waste management education to improve the current situation.

1.2 Purpose and Aim

The purpose of this audit analysis and report is to establish a baseline position for Vanuatu's waste data and waste management systems.

The aim of this audit analysis report is to:

- Validate pre-existing national waste audit data;
- Collect additional data to address data gap of the 2023 National Analysis Report ; and
- Build national waste insights based on new key performance indicators (KPIs) to understand waste management trends.

The results of this report, and the other fourteen SPREP country audit analysis reports, will be collated together to inform a broader Pacific Regional Data and Audit Analysis Report.

1.3 Scope

The scope of this report is limited to the following waste data collected in Vanuatu:

- **Vanuatu waste audit report 2018:** The audit conducted by Asia Pacific Waste Consultants, provided an evaluation of household and business waste generated in Vanuatu. Audit data and information was obtained via interviews and waste collections from 205 households and 45 businesses.
- **Vanuatu waste audit report 2020**: The audit conducted by Consultants (APWC) subcontracted through Tonkin & Taylor International Limited, provided an assessment of the state of Vanuatu's landfills including landfill audits and stockpile assessments.
- **2021 IUCN Plastic Waste-Free Islands (PWFI) Reports**
- **2023 MRA Consulting National Waste Audit Analysis Report**
- **2025 Eunomia Research & Consulting Waste Facility Register**

1.4 Country Overview

The Republic of Vanuatu is a group of more than 80 islands located in the Pacific Ocean's Melanesia region (see map on Page 4 of this report). It spans a total area of 12,189 square kilometres and has a total coastline length of 2,530 kilometres. The country is home to over 300,000 people, with 22% residing in urban areas and 78% in rural areas.

Vanuatu's total population is growing at a rate of about 2.4% annually. Most of the urban population is concentrated in the capital city of Port Vila on the island of Efate, and in the city of Luganville on the larger island of Espiritu Santo.

Vanuatu's Department of Environment Protection and Conservation (DEPC) developed the *National Environment Policy and Implementation Plan 2016-30* which aligns with the country's *National Sustainable Development Plan*. This plan, along with the regional *Cleaner Pacific 2025* strategy (*Cleaner Pacific 2025: Pacific Regional Waste and Pollution Management Strategy 2016-2025*), include specific actions aimed at improving solid waste management.

The responsibility for managing solid waste is divided among various institutions in Vanuatu, which include:

- National government: The national government is responsible for creating national legislation, strategies, and policy frameworks for waste management, as well as fulfilling obligations under international conventions, primarily through the Department of Environment Protection and Conservation (DEPC).
- Provincial government: The provincial government establishes the local regulatory framework for waste management.
- Local/municipal government: The local/municipal government is responsible for providing household waste collection, recycling services, managing and operating landfill sites, and educating and raising awareness among local communities. This includes the Port Vila Municipal Council (PVMC), Luganville Municipal Council (LMC), and Lenakel Town Municipal Council (LTMC).

Non-governmental organisations (NGOs) and donor partners, as well as businesses such as waste collection contractors and private recyclers, also play a role in the waste management and resource recovery sector.

Management of hazardous wastes such as medical waste or used oil are typically regulated by the corresponding government department or ministry.

2 Methodology

Waste data collation, analysis and reporting was guided by the overarching Regional Waste Data Collection, Monitoring, and Reporting (DCMR) Framework for the Pacific Island Countries and Territories (PICT). The implementation of the DCMR Framework ensures that waste data is collected, analysed, and reported in a consistent and reliable way across the Pacific.

2.1 Data sources

Data collated and examined in this audit analysis report was sourced from the data sources listed in **Table 1**.

Table 1 Data sources examined and available data

Data Source	Year	Location/s	Sample Size/s	Method for Data Collection	Reported Data
Plastic Waste-Free Islands (PWFI) Project IUCN	2021	Port Vila, Shefa Rural, Ifira Island, Lelepa, Luganville	204	Household audit	Per capita generation, waste composition, total household waste generated
PWFI Project IUCN	2021	Port Vila, Shefa Rural, Lelepa, Luganville	186	Household survey	Waste collection coverage, Awareness of waste services
PWFI Project IUCN	2021	Port Vila, Luganville	67	Commercial survey	Waste collection coverage
Vanuatu Land Waste Audits and Interviews CLiP Cefas	2018	Port Vila, Luganville, Ifra, Black Sands, Lelepa	205	Household audit	Per capita generation, waste composition, total household waste generated
Vanuatu Land Waste Audits and Interviews CLiP Cefas	2018	Port Vila, Luganville, Ifra, Black Sands, Lelepa	201	Household survey	Waste collection coverage, Awareness of waste services
Vanuatu Waste Audit Report	2020	Efate, Espiritu Santo	5 stockpiles, 330 vehicles, 2 landfills	Stockpile, vehicle, and landfill audits	Locations of stockpiles, composition of waste at landfills
Vanuatu National Waste Audit Analysis Report	2023	Nationwide	The National Waste Audit Analysis Report uses data from the Tonkin + Taylor Waste Audit Report outlined above.		
Waste Facility Register	2025	Nationwide	6	Facility registers	Number and capacity of facilities, waste disposed, waste recovered, cost of landfill operation, hazardous waste stockpiled, disaster waste

The 2018 and 2020 audits were performed with separate methodologies, scopes and objectives and were completed by different organisations.

2.2 Data Analysis

The datasets listed in the table above were analysed for relevant information to be collated into PICT specific databases. The extracted data was then used to calculate the 18 KPIs according to the calculation methodologies as detailed in the DCMR Framework. The main assumptions made and challenges met during the analysis are discussed below.

Where it was necessary to modify calculation methodologies or assumptions (e.g. in cases of missing data or when certain parameters had to be calculated using assumptions derived from external data sources like census data), details of the changes are provided under the corresponding KPI in section 3.0 Analysis.

2.2.1 Main Assumptions

- The main assumption is that the previously collected data is representative of the goals of the current project. Previous audit was conducted on a large and geographically dispersed sample of households and businesses, but the method of sampling was cross-sectional, i.e., multiple samples were collected at one point in time. Therefore, for these results to be representative, we need to make two key assumptions:
    1. Seasonal variation in waste generation and composition is non-existent or low,
    2. Large time-frame variation (several years) in waste generation and composition is non-existent or low.
- While there are solid grounds for these assumptions, there are no empirical records to support them.
- Specific assumptions for each KPI calculations are also discussed in Section 3.2 KPI Reporting Results. For calculation of national averages involving different geographical locations, weighting is done to ensure a more representative value at the national level. This applies to both household/commercial audits and community surveys.

2.2.2 2.2.2 Main Challenges

The collection and analysis of data to measure the KPIs can be quite challenging in the Pacific Region due to the following:

1. Oftentimes, facilities do not carry licenses and as such, capacity to accept waste is not always known. In most cases, operation exceeds capacity due to lack of foresight on the remaining capacity. In addition, planning for new waste facilities can be daunting due to limited options to locate a site. The reasons could be land tenure, site suitability especially for atoll islands, and community approval for potential sites within human settlements.
2. Most of the waste facilities did not undergo Environmental Impact Assessment and as such are operating without necessary environmental controls. This could have been addressed in the licensing process but is not happening due to limited options available to site the facilities.
3. Data collection relies on guess estimates due to lack of proper recording system of waste material flow and receipt of these materials in the facilities. The measurement of capture rate could be very challenging with the lack of data on wastes received in the facilities.
4. It is hard to determine recovery of materials to calculate national recovery rate since most of the materials remain stockpiled and not processed or exported and as such cannot be considered a return to economy. In the case of green waste diversion, Vanuatu has a good system of recovery and processing of these materials producing compost or mulch.
5. Request for information from the countries is very challenging given the very limited time to deliver this project. Based on Consultants' experience working in the Pacific, requested data may be likely provided within four months at a minimum.
6. Most disposal sites are unregulated and are operating sub-standardly and cost may not reflect what should have been spent. Also, most disposal sites operate on a fixed budget and do not consider changing disposal pattern and as such performance improvement cannot be monitored through disposal costs.
7. There is difficulty in locating stockpiles since some of these are stored in backyards with no proper storage facility. Most of the stockpiles are unreported.
8. There seems to be ambiguity in measuring success of initiatives since there is no established M & E framework in national implementation of projects unless the project is regional in scope with donor funding

9. The disposal sites are not recording incoming disaster waste since these are emergency actions which are not closely monitored. There may have been disaster wastes dumped anywhere close to the affected areas and remain there for a long time. Demolition may take years.
10. While the introduction of Kobo Toolbox may be helpful in recording data on the spot, there is some degree of reluctance on its use with more preference still given to the paper record. An intensive training on its use as part of a separate data recording training would promote its wider use.

2.3 Key Performance Indicators

The DCMR Framework introduces a series of KPIs (see

Table 2). The KPIs were developed to guide data analysis with the aim of improving the efficiency of data collection activities by building on pre-existing data collection practices across the region.

Each of the KPIs were designed to be reported to using corresponding data collection methodologies.

These comprise of:

- a waste facility register
- household waste audits and community surveys
- business waste audits and surveys
- a policy survey
- landfill and stockpile audits

Table 2 Key Performance Indicators (KPIs) from the DCMR Framework

Core KPIs	Supplementary KPIs
1. Count / capacity of modern waste facilities	1. Cost of disposal to landfill
2. Count / capacity of unregulated waste facilities	2. Weight of waste disposed
3. National recovery rate	3. Weight of waste recovered
4. Per capita waste generation rate	4. Volume and type of stockpiled hazardous waste
5. Municipal Solid Waste (MSW) composition	5. Marine plastic pollution potential
6. Household waste capture rate	6. Awareness and support of waste management services
7. Household collection service coverage	7. Proportion of strategic waste management initiatives implemented
8. Fulfillment of Multilateral Environmental Agreement (MEA) reporting requirements	8. Commercial waste capture rate
	9. Commercial collection service coverage
	10. Total weight of disaster waste disposed

3 Audit Analysis Results

3.1 Summary of Data Availability

The waste audits provided varying levels of data and information for the purposes of calculating performance via the indicators introduced in the DCMR Framework. The extent to which there was adequate data and information to calculate the KPIs is represented below in **Table 4**.

Table 4 - Summary of data availability for reporting against DCMR Framework KPIs

Core KPIs		Supplementary KPIs	
1. Count / capacity of modern waste facilities		1. Cost of disposal to landfill	
2. Count / capacity of unregulated waste facilities		2. Weight of waste disposed	
3. National recovery rate		3. Weight of waste recovered	
4. Per capita waste generation rate		4. Volume and type of stockpiled hazardous waste	
5. Municipal Solid Waste (MSW) Composition		5. Marine plastic pollution potential	
6. Household waste capture rate		6. Awareness and support of waste management services	
7. Household collection service coverage		7. Proportion of strategic waste management initiatives implemented	
8. Fulfillment of MEA reporting requirements		8. Commercial waste capture rate	
		9. Commercial collection service coverage	
		10. Total weight of disaster waste disposed	

Note: 'No data' indicates that the audit did not capture the parameters/measurements necessary to calculate the KPI.

Legend

Calculated with additional data	Calculated in previous report	No data

Notes on insufficient data:

- Capacity was not provided for any waste facility. The capacity of Bouffa Landfill was provided using the estimation made during the design phase of the expansion of the Bouffa Landfill through JICA
- Insufficient data was provided to calculate national recovery rate (only covered Port Vila and Luganville in the equation) as per 2023 report Insufficient data on hazardous waste stockpiles were provided, this can be updated upon receipt of facility registers
- No records of commercial waste received in the facilities are available so commercial waste capture rate was unable to be calculated.

3.2 KPI Reporting Results

The following sections present the results of the collated and analysed waste audit data for each of the eight core and ten supplementary KPIs introduced in the DCMR Framework. The results of the analysis will serve as a baseline position for Vanuatu to compare future data to, and to guide subsequent waste management or waste data related activities.

Core KPI 1: Count / capacity of modern waste facilities

Result	**Count of modern waste facilities: 1** • The only recycling facility in Vanuatu, RecycleCorp, is considered a modern facility. • None of the four documented waste disposal facilities in Vanuatu meet the requirements of a 'modern' facility as per the DCMR. **Capacity of modern waste facilities (tonnes per annum): 0**
Assumptions	None
Data gaps	• No estimates or parameters were used to calculate the maximum annual processing capacity (tpa) of any of the four Vanuatu disposal sites. • No information available for Lenakel or Lakatoro dumpsites. – Staffing, equipment access, leachate management, daily cover use – Disposal tonnages
Key considerations	• There are no landfills or dumpsites in Vanuatu which are up to 'modern' standards. • Relevant data for 2 out of 4 facilities (Bouffa and Luganville) was reported. • Lack of leachate management at these facilities means that both the environment and community are at risk of hazards due to contamination and material flow. • No daily cover usage at the landfill sites means that these sites are very susceptible to material flow during climate-related weather events such as cyclones. • Investment to upgrade existing landfills in Vanuatu to meet with modern standards / best practice will lead to better outcomes for the local environment and community health.

Core KPI 2: Count / capacity of unregulated waste facilities

Result	**Count of unregulated waste facilities**: **5** • None of the four disposal facilities reported to meet the requirements of a 'modern' facility and as such are classified as 'unregulated'. The following information are presented in the audit reports: o Bouffa landfill: There is staff operating the facility and it has a dedicated bulldozer. However, the leachate management system in place is non-functional. The required daily cover is not applied. Landfill capacity is not known. o Luganville dumpsite: Staffed and has access to a bulldozer. Leachate management system is non-existent, and daily cover is not practiced. No information on landfill capacity. o Lenakel dumpsite: No relevant information found in audit reports. o Lakatoro dumpsite: No relevant information found in audit reports. **Capacity of unregulated waste facilities (tonnes per annum): No data** Projected capacity for Bouffa is 423,000 m3 at the end of its life.
Assumptions	The estimated capacity of Bouffa Landfill is reported as total tonnage and volume to fill up the landfill at the end of its life. Using the landfill waste density of 0.20 tonnes/m3 as conversion factor, the projected 423,000 m3 or 84,600 tonnes capacity is nearing to be exceeded considering the 21,000 tpa disposal rate (SKPI2).
Data gaps	• No estimates or parameters were used to calculate the maximum annual processing capacity (tpa) of any of the four Vanuatu disposal sites. • No information available for Lenakel or Lakatoro dumpsites.
Key considerations	• All facilities are classified as unregulated according to the DCMR. • Only 2 out of 4 facilities (Bouffa and Luganville) have relevant information. • There are very limited environmental controls in place at the landfill sites. Without leachate management, the environment and community are at risk of hazards due to contamination and material flow. • Uncontained waste with no daily cover exposes these materials and likely spill over to the environment during high winds or climate-related weather events such as cyclones. • The identified unregulated facilities present investment opportunities to upgrade existing sites to align with best practice. Reducing the number of these facilities will lead to better outcomes for the local environmental and community health.

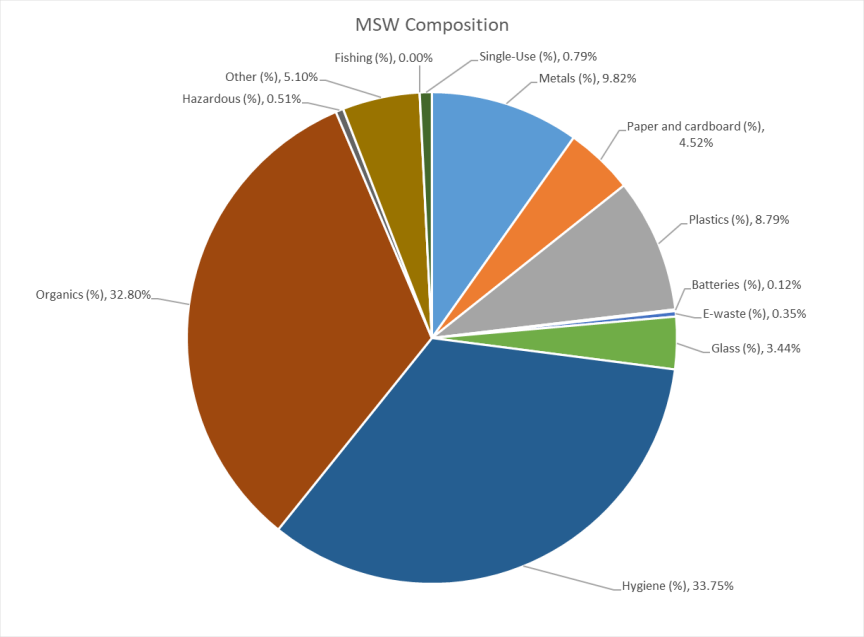
Core KPI 3: National recovery rate

Results	**National recovery rate (%): Insufficient data (Port Vila and Luganville: 11.66%)** • RecycleCorp, a private company, is the only major party responsible for recycling in Vanuatu. Their efforts focus on collecting aluminium cans, glass, scrap metal, batteries, and electronic waste. They operate in both Port Vila and Luganville. RecycleCorp purchases waste from pickers at landfills and offer 240-litre mobile garbage bins to commercial customers in Port Vila for a fee. There are no other recycling services available in other provinces. • Targeted materials include: – Aluminium – Copper – Nonferrous metals – Glass – E-waste – Used lead acid batteries
Assumptions	• Only the quantity of wastes received from Bouffa and Luganville dumpsite is used to estimate the total amount of waste disposed at the landfill per annum to calculate the percentage recovery.
Data gaps	• The lack of information in other disposal facilities apart from Bouffa and Luganville limits the estimation of the quantity of wastes disposed and recovered at the national level. • No current information was provided by RecycleCorp.
Key considerations	• Due to the lack of information as to the total amount of waste disposed at landfill across Vanuatu, and the fact that RecycleCorp only operates in Luganville and Port Vila, there is insufficient data to present a recovery rate at the national level. • Based on the last audit, RecycleCorp manages to divert approximately 12% of targeted materials disposed of in Port Vila and Luganville which is already significant. • The audit report highlighted that high export costs for consolidated recycled material posed a barrier to expanding current recycling operations. Further investigation of these barriers to recovery is recommended.

Core KPI 4: Per capita waste generation rate

Results	**Per capita waste generation rate (kg/capita/year): 124.38** – kg/capita/day: 0.341 – kg/household/day: 1.62
Assumptions	• Household waste audit data was converted from a per household basis to a per capita basis. The weighted average is calculated based on geographic position (i.e., rural, semi-urban or urban), and extrapolated using census data of the population to get the national average. • Population data used to calculate per capita information was based on 2020 census results. • Where provinces had no data (i.e., Torba, Sanma, Penama and Malampa), an assumed 'rural' average waste generation rate was used based on household audit data from Shefa (including Ifira and Black Sands, excluding Port Vila). • Areas around Port Vila which could be considered semi-urban due to access to Port Vila but being located geographically outside the municipality, were assigned 'rural' average waste generation rates. • Outer islands were sampled as rural representative samples. No census data was available for these islands. Population estimates were derived from other publicly available data sources.
Data gaps	• No information recorded in the provinces of Torba, Sanma, Penama and Malampa. • Not all regions, islands or towns/villages represented in audits have corresponding data represented in the 2020 census. • No information for waste generation rates in semi-urban areas.
Key considerations	• There needs to be some exploration of a semi-urban category, due to populations living near Port Vila and Luganville having access to the cities while also living outside their limits. It is recommended that future data audits consider the addition of these areas to obtain a more representative sample of 'semi-rural'/'peri-urban' waste generation in Vanuatu. • Future per capita waste generation rates will provide insight into waste management trends and changes for Vanuatu.

Core KPI 5: Municipal Solid Waste (MSW) Composition

Results	Hygiene is the most prevalent waste category for household waste in Vanuatu, followed by organics, metals, and plastics. The composition is detailed below: • Hygiene: 33.8% • Organics: 32.8% • Metals: 9.8% • Plastics: 8.8% • Paper and cardboard: 10.5% • Plastics: 8.4%  Figure 1 Vanuatu Municipal Solid Waste (MSW) composition (% by weight)
Assumptions	None
Data gaps	• Categories reported in the audit are based on the 2018 waste audit, which predates the PRIF waste audit guidelines. These categories were converted to the PRIF audit guideline categories to report to this performance indicator. • No samples taken in the provinces of Torba, Sanma, Penama and Malampa.
Key considerations	• The prevalence of organics in the household waste stream is likely due to reliance on local subsistence agriculture, as rural communities often have fewer options for food and goods, which can result in a greater reliance on locally grown or produced items. • Organics recovery systems, such as a local or national composting service could help support local farmers and reduce the amount of organic waste destined for landfill. • It is recommended that compositional data is updated data on a regular basis. Impacts of the pandemic and climate change or weather events will have changed the proportions of waste types sourced from households. • Household waste compositions provide an insight into the types of waste contained inside the MSW stream. Knowledge of the waste types and proportion of these wastes present within the household waste stream allows for targeted decision making and prioritisation of

problem waste types.

Core KPI 6: Household waste capture rate

Results	**Household waste capture rate (%): 88.33** – Total weight of household waste generated = 15,138 tpa – Total weight of household waste captured responsibly = 13,371 tpa
Assumptions	• The survey and audits did not capture each household's disposal method, or the weight of waste captured by management services, so census data was used and extrapolated across household audit results. $$Household\ waste\ capture\ rate\ (\%) = \frac{weight\ of\ managed\ waste\ (tpa)}{total\ household\ waste\ generated\ (tpa)}$$ Total weight of managed waste is calculated as the product of: $$weight\ of\ managed\ waste\ (tpa) = \frac{household\ collection\ coverage\ (\%)}{total\ household\ waste\ generated\ (tpa)}$$ Collection service coverage (%) is the product of: $$household\ collection\ coverage\ (\%) = \frac{number\ of\ households\ with\ some\ form\ of\ collection\ service}{total\ number\ of\ households}$$ Total household waste generated is the summation of waste generation tonnages for all sampling locations. Waste generation rates for individual sampling locations are calculated by: $$total\ household\ waste\ generated\ (tpa) = average\ waste\ generation\ rate\ of\ location\left(\frac{kg}{\frac{capita}{year}}\right) \times location\ population$$
Data gaps	• No information on the weight of waste captured by waste management services or received in the facilities
Key considerations	• Majority of the waste generated in Vanuatu is captured by formal collection services (i.e., successfully captured and disposed of or recovered in an environmentally responsible manner). • The remaining proportion of waste generated which is not captured via waste management services is at risk of being burned, littered, buried, or dumped which poses a risk to both environmental and community health.

Core KPI 7: Household collection service coverage

Results	• **Household collection service coverage (%): 75.14**
Assumptions	• Calculated based on information from 2020 census data: • Number of households • Number of households with access to a collection service per area or location
Data gaps	• None
Key considerations	• Three quarters of the population of Vanuatu has access to some reliable form of waste collection service. • A community survey undertaken as part of the audit allowed calculation of this KPI according to the requirements of the DCMR Framework.

Core KPI 8: Fulfillment of Multilateral Environmental Agreement (MEA) reporting requirements

Results	**Fulfillment of MEA reporting requirements (%): 41.67%**

Convention	Status	Reporting requirements	Reports delivered
Basel Convention	Accession	Annual reports (4)	0
Minamata Convention	Accession	1 report	1
Stockholm Convention	Ratified	5 reporting cycles (5)	1

Data gaps	None
Assumptions	• Only MEA's with mandatory reporting requirements were included in the calculation of this KPI. • For conventions like the Waigani convention of which Vanuatu is a member, strict reporting requirements are not enforced and so are not included in the calculation.
Key considerations	• Vanuatu has satisfied the reporting requirements for the Minamata convention on Mercury. • Vanuatu is behind on national reports for the Basel and Stockholm conventions.

Supplementary KPI 1: Cost of disposal to landfill

Results	**Cost of disposal to landfill ($/tonne): US$30.10**
Assumptions	The data used to calculate the Bouffa tonnage was based on the estimated 57 tonnes per day of discharge at Bouffa Landfill (JICA study cited in the APWC CLiP audit)
Data gaps	• Insufficient information to calculate the annual quantity of waste disposed (tpa): • Estimates are only present for Bouffa Landfill and Luganville dumpsite, no information present for Lenakel and Lakatoro dumpsites
Key considerations	• Completion of the waste facility register suggested by the DCMR Framework will provide sufficient data to accurately calculate this indicator and a benchmark for comparing disposal costs against previous periods, other countries, and the region. • Additional data was partially collected from Bouffa and Luganville through the Kobo Toolbox. However, the Bouffa records have to be validated so the estimate of tonnage was based on the JICA study as cited in the audit report; the Luganville data was used • Governments and private industry would also be more able to accurately budget for estimated future costs.

Supplementary KPI 2: Total weight of waste disposed

Results	**Total weight of waste disposed (tonnes per annum): 21,346**
Assumptions	• The partial data received was extrapolated to calculate annual tonnages using the 0.2 tonnes/m3 density factor. • The data used to calculate the Bouffa tonnage was based on the estimated 57 tonnes per day of discharge at Bouffa Landfill (JICA study cited in the APWC CLiP audit).
Data gaps	• Insufficient information to calculate the annual quantity of waste disposed (tpa): • Partial disposal estimates are only present for Bouffa Landfill (last quarter of 2024) which was not used and Luganville dumpsite (10 months of data). • No information presented for Lenakel and Lakatoro dumpsites.
Key considerations	• Current weight of waste disposed is not representative of all waste sent to landfill in Vanuatu, due to data gaps for Lenakel and Lakatoro dumpsites. • For Bouffa and Luganville landfills, 21,346 tonnes of material are disposed per annum based on the JICA estimate as mentioned above for Bouffa Landfill (20,805 tpa) and the records provided at LMC (541 tpa). • This KPI is expected to increase considerably once data is collected from other facilities in the future using the waste facility register suggested in the DCMR Framework.

Supplementary KPI 3: Total weight of waste recovered

Results	**Total weight of waste recovered (tonnes per annum): 656** Waste is recovered via RecycleCorp, a private recycler operating in both Port Vila and Luganville, • Targeted Materials include: – Aluminium – Copper – Nonferrous metals – Glass – E-waste – Used lead acid batteries
Assumptions	None
Data gaps	• Lack of dedicated recovery facilities in Vanuatu mentioned in audit report.
Key considerations	• RecycleCorp, Vanuatu's only dedicated recycling operation at the time of the audit report, recovers approximately 656 tonnes of waste from landfill per annum. • Calculation of this KPI requires the completion of the waste facility register with the inclusion of data for any recovery facilities operating in the Solomon Islands. This will indicate the effectiveness of a country's waste management systems, recovery systems & infrastructure, and a comparative data point for other countries and time periods.

Supplementary KPI 4: Volumes of stockpiled hazardous waste

Results	**Volumes of stockpiled hazardous wastes (m^3):** – Asbestos: No data – E-waste: 6.7m^3 – Healthcare and pharmaceutical waste: No data – Used oil: 300m^3 – Used tyres: No data – Obsolete chemicals: No data
Assumptions	• The quantity of stockpiled used oil was estimated in the feasibility study conducted prior to the development of the Used Oil Management Plan.
Data gaps	• E-waste stockpile volumes reported for Bouffa Landfill and Luganville dumpsite. No data for Lenakel and Lakatoro dumpsites. • No stockpile volume measurements recorded in audit data for most of the other hazardous waste categories.
Key considerations	• The volume of other hazardous waste stockpiles in Vanuatu remains unknown. • Landfill audits, stockpile assessments, and the completion of the waste facility register as proposed by the DCMR Framework will provide the necessary information to make calculate this indicator.

Supplementary KPI 5: Marine plastic pollution potential

Results	**Marine plastic pollution potential (tonnes per annum): 155.39**
Assumptions	• Weight of mismanaged waste is estimated from the household audit. • This calculation uses the total weight of waste generated, subtracted by the weight of waste captured by collection services. The difference is the estimate for mismanaged waste used in this calculation. • Mismanaged waste is defined as all waste which is not captured in collection services, and ends up buried/burned/littered etc. • Uses a proportion of plastics captured in MSW composition.
Data gaps	• Requires a more reliable metric for mismanaged waste.
Key considerations	• Waste plastics which are not managed in an environmentally sound manner are assumed to pose a significant risk of polluting oceans and estuarine waterways.

Supplementary KPI 6: Awareness of waste management services

Results	**Awareness of waste services (%): 47.31**
Assumptions	• The survey question assessed the collection service as a whole, and was not directed to all possible waste services. Therefore, a value of 1 was assigned as number of available services in the formula to calculate awareness.
Data gaps	• No presentation of different waste services in the survey questionnaire
Key considerations	• Monitoring the community's awareness provides an indication of the success of education initiatives and the effective use of existing waste management services. • Less than half of the population is aware of the waste services provided.

Supplementary KPI 7: Proportion of strategic waste management initiatives implemented

Results	**Proportion of waste management initiatives implemented (%): 73.68%** – Number of successfully implemented waste initiatives = 14 out of 19 – Number of planned/pipeline initiatives = 5 • Implemented initiatives include: – Vanuatu National Environment Policy and Implementation Plan 2016 – 2030 – Waste Management Act 2014 – National Waste Management, Pollution Control Strategy and Implementation Plan 2016-2020 Pipeline initiatives include: – Container deposit scheme – National Disaster Waste Management Action Plan – Second Phase of Plastics Ban
Assumptions	None
Data gaps	None
Key considerations	• Vanuatu's primary waste legislation is the Waste Management Act 2014. Before this there was no official waste legislation in the country. • Vanuatu introduced the National Waste Management and Pollution Control Strategy and Implementation Plan 2016-2020, but this is now due for review. • Waste management in Vanuatu is overseen by the national and provincial governments, with the primary responsibility for waste management lying with the provincial governments.

Supplementary KPI 8: Commercial waste capture rate

Results	**Commercial waste capture rate (%): 100** • Theoretically, this is measured as the fraction of the total waste captured through formal waste management services over the total waste generated by businesses
Assumptions	• The number of registered businesses was used to calculate a weighted average of daily generation per business from the audit, and assumed that each country has 250 work days a year.
Data gaps	• No estimate for the total amount of commercial waste successfully captured by management services identified. • No information on waste generation rates or the total amount of waste generated by businesses except for samples in Luganville and Port Vila.
Key considerations	• Accurate calculation relies on an estimate of total numbers of businesses in the country categorised by business type, and an estimate of the commercial waste generation rates for each business type. • Completion of business surveys suggested in the DCMR Framework will provide an indication of how many businesses are using collection services, and other forms of waste management, and to what extent these businesses access the service.

Supplementary KPI 9: Commercial collection service coverage

Results	**Commercial collection service coverage (%): 100** • Port Vila and Luganville have implemented a user-pays system for commercial solid municipal waste collection. Collection is also carried out by private contractors in the Port Villa area.
Assumptions	None
Data gaps	• No information on the total number of businesses participating in collection services nationally. • No information on the specific commercial collection service coverages by region. • No information provided on the access that businesses have to alternative collection services (e.g., waste disposal-points or self-haul).
Key considerations	• Accurate calculation relies on understanding the total number of businesses participating nationally, and specific collection service coverages for businesses. • Completion of business surveys suggested in the DCMR Framework, would provide an indication of how regular, accessible, and affordable collection services are for businesses.

Supplementary KPI 10: Weight of disaster waste disposed

Results	**Weight of disaster waste disposed (tpa): No data** • Measured as a sum of the recorded weight of disaster waste disposed to landfill or received and stockpiled at waste facility following a disaster event. • No disaster waste data was recorded during the examined audits.
Assumptions	• Only captures disaster waste which ends up disposed of or stored at waste facilities, including landfills, disposal sites and recovery facilities. • Assumes that the waste facility register has been completed to capture disaster waste information separately of other waste loads received post-event (i.e., information on disaster waste categorised separately to other waste types/streams).
Data gaps	• The calculation of this performance indicator relies on estimations of the weight of disaster waste (tonnes) landfilled or received at a waste disposal facility following disaster events.
Key considerations	• Calculation of this performance indicator provides an estimate of the amount of disaster waste being effectively managed and the total amount of disaster waste generated in a year. • Calculating this KPI can be undertaken by regularly updating the waste facility register. Tracking the vehicle capacity and percentage fullness of the load for any 'disaster waste' carrying vehicles entering the facility will help reconcile waste amounts disposed if these wastes are not managed separately.

4 Conclusion

From this exercise, the following findings and recommendations are drawn:

1. Vanuatu had the benefit of having two waste audits conducted within a span of two years from 2018 to 2020 through the Commonwealth Litter Programme (CLiP) by Cefas and through the Plastic Waste-Free Islands Project by IUCN. This provided the opportunity to gather as much data as possible. With further investigation of the raw data, calculations of most of the KPIs were done in this study.

2. The two audit results prompted Vanuatu to develop policies to address targeted waste issues such as single-use plastics and nappies. It placed the country in the spotlight because of these initiatives.

3. The improved waste management system in Vanuatu should be sustained and further support is needed for areas with limited data availability. There is a strong need to encourage continuous recording system to be in place for most of the facilities in the countries.

4. The online recording system can potentially contribute to the collection and storage of data. This can facilitate easy access to the data and reduces risk of data loss.

5. While the previous 2023 analysis presented KPI calculations based on sufficient data in Vanuatu, some of these KPIs were recalculated based on raw data from the waste auditors who did the actual audit. There were differences (some are slight) owing to the weighting approach done in the calculation of national averages. There were also KPIs with no data reported in the previous report which are actually available from the raw data of the actual waste audit. The common methodology approach which was agreed prior to the recent audits should be strictly used to allow lateral comparison among the countries and enable more reliable regional data.

6. There is still a huge gap in the data received from countries owing to the limited recording system available to monitor waste material flow. If recording is done regularly and data stored properly and made available for any legitimate request from external customers, there may be lower probability of obtaining guess estimates of material flow. The confidence level of available data could be made higher.

5 Appendix

5.1 Collection Methods

The KPIs are calculated from a range of data sources. They are listed in the below table with information about what KPIs they inform, how they work, and how often they need to be collated.

Collection Method	What the Collection Method Informs	About the Collection Method	Frequency of Reporting
Waste Facility Register	**KPI 1** Count and capacity of modern waste facilities **KPI 2** Count and capacity of unregulated waste facilities **KPI 3** National recovery rate **SKPI 1** Cost of disposal to landfill **SKPI 2** Weight of waste disposed **SKPI 3** Weight of waste recovered **SKPI 4** Volume and type of stockpiled hazardous waste **SKPI 10** Weight of disaster waste disposed.	The Waste Facility Register is a written survey that can be completed on Word, Excel, Kobo Toolbox, or something similar. It should be completed by or on behalf of waste facility operators.	Annual submission of monthly report (all KPIs and SKPIs). As and when disaster events occur (SKPI 10).
Household Community Survey	**KPI 4** Per capita waste generation rate **KPI 6** Household waste capture rate **KPI 7** Household collection coverage **SKPI 5** Marine plastic pollution potential **SKPI 6** Awareness and support of waste management services.	The Household Community Survey is a written survey that can be completed on Word, Excel, Kobo Toolbox, or something similar. It should be completed by or on behalf of households in Vanuatu. Sample size: 186; Locations: Port Vila, Shefa Rural, Ifira Island, Lelepa, Luganville	Every five years.
Household Compositional Waste Audit	**KPI 4** Per capita waste generation rate **KPI 5** Municipal solid waste (MSW) composition **KPI 6** Household waste capture rate **SKPI 5** Marine plastic pollution potential.	The Household Compositional Waste Audit is a sort and weigh audit undertaken according to the Waste Audit Methodology: A Common Approach.[1] Sample size: 204; Locations: Port Vila, Shefa Rural, Ifira Island, Lelepa, Luganville	Every five years.
Commercial Community Survey	**SKPI 6** Awareness and support of waste management services **SKPI 8** Commercial collection service coverage **SKPI 9** Commercial collection service coverage.	The Commercial Community Survey is a written survey that can be completed on Word, Excel, Kobo Toolbox, or something similar. It should be completed by or on behalf of households in Vanuatu. Sample size: 67; Locations: Port Vila	Every five years.

[1] https://www.sprep.org/sites/default/files/documents/publications/waste-audit-methodology-common-approach.pdf

Collection Method	What the Collection Method Informs	About the Collection Method	Frequency of Reporting
Commercial Compositional Audit	**KPI 4** Per capita waste generation rate **KPI 5** Municipal solid waste (MSW) composition **SKPI 5** Marine plastic pollution potential.	The Commercial Compositional Waste Audit is a sort and weigh audit undertaken according to the Waste Audit Methodology: A Common Approach. Sample size: 45; Locations: Port Vila and Luganville	Every five years.
Landfill Activity Audit	Landfill Activity Audits can help to validate incomplete Waste Facility Register surveys.		Every five years if Waste Facility Register is incomplete.
Hazardous Stockpile Audit	Hazardous Stockpile Audits can help to validate Waste Facility Register surveys that have incomplete data on stockpiled hazardous waste. The audits are typically visual and estimate volumes of the following hazardous waste categories: • Asbestos • E-waste • Healthcare and pharmaceutical waste • Used oil • Used tyres • Obsolete chemicals.		Every five years if Waste Facility Register is incomplete.
Policy Survey	**KPI 8** Fulfilment of MEA reporting requirements **SKPI 7** Proportion of strategic waste management initiatives implemented.	The Policy Survey is a written survey that can be completed on Word, Excel, Kobo Toolbox, or something similar. It quantifies the number of planned national and regional strategic initiatives over time.	Biennial.
Disaster waste	**SKPI 10** Weight of disaster waste disposed	Data on waste generated from disaster events is captured via the Waste Facility Register.	Annual/after disaster events.
Census data	**KPI 4** Per capita waste generation rate **SKPI 5** Marine plastic pollution potential.	Population data to inform the per capita waste generation rate and marine plastic pollution potential.	N/A
Customs Import and Export Data	Can be used to inform KPIs on waste generation, recovery rate, and capture rates.		N/A
Commercial Data	Number of total businesses and type to allow data to be used for national extrapolation.		N/A

5.2 KPI Calculations

5.2.1 Calculations for Core KPIs

KPI	Data Source/s	Formula and Notes	Definitions
1. Count / capacity of modern waste facilities	**Waste Facility Register**	**Count of modern facilities** The number of modern waste facilities, including incinerators. **Capacity of modern facilities** The theoretical maximum facility capacity based on the facility license in tonnes per annum for each modern waste facility, including incinerators.	**Modern** – A 'modern' facility employs 'sound waste management practices' (as defined by the UNEP) and results in minimal adverse impacts on the environment. A 'modern' facility must be licensed, staffed, and have access to equipment and machinery such as a bulldozer. A landfill or dumpsite must employ a leachate management system and a daily cover routine. A waste recovery facility should have fire prevention and control measures in place, and appropriate stormwater runoff controls. Facilities must not be exceeding their maximum storage capacity. **Waste facilities** – 'Waste facilities' involved in the handling, disposal, or recovery of waste streams above a minimum processing threshold determined on country basis (i.e., tonnes of waste received per year). Can include landfills or dumpsites (that primarily rely on burying waste in a controlled manner), recycling / recovery facilities for dry

KPI	Data Source/s	Formula and Notes	Definitions
			recyclables (and e-waste), organics recovery facilities, and waste-to-energy facilities.
2. Count / capacity of unregulated waste facilities	**Waste Facility Register**	**Count of unregulated facilities** The number of unregulated waste facilities. **Capacity of unregulated facilities** The theoretical maximum facility capacity based on the facility license in tonnes per annum for each unregulated waste facility.	**Unregulated** – typically unlicensed waste facilities which do not follow international frameworks, rules, and guidelines to protect the health of the environment and community. **Waste facilities** – refer to **KPI 1** definitions above.
3. National recovery rate (%)	**Waste Facility Register**	**National recovery rate** Calculated using the below formula: $\frac{\textit{Tonnes per annum of waste diverted from landfill}}{\textit{Tonnes per annum of waste received by all waste facilities}}$ This excludes informal and small-scale recovery activities that take place outside of waste facilities. However they can be calculated separately using the following formula where waste generated is the sum of what is recovered and disposed of: $\frac{\textit{Tonnes per annum of target waste stream recovered}}{\textit{Tonnes per annum of target waste stream generated}}$ • Where facilities do not have weighbridges conversion factors can be applied to convert volume (m^3) to tonnage (t).	**Recovery** – any activity that diverts waste material from landfill, including: • Dry recycling – the separation and reprocessing of dry recyclables including paper, cardboard, metal, and certain plastics. • Organics recovery – the mulching or composting of mixed organics to produce new products. • Energy recovery – waste processing that allows for the capture and reuse of

KPI	Data Source/s	Formula and Notes	Definitions
			energy.
4. Per capita waste generation rate (kg/capita/year)	**Household waste audit** **Household Community Survey** **Census data** (population distribution, socio-economic conditions)	**Per capita waste generation rate** Calculated using the below formula: $\frac{Tonnes\ per\ annum\ of\ waste\ generated}{National\ population}$ This KPI considers household waste only. This calculation needs to consider the locations where compositional waste audits and surveys were undertaken to apply the audit results appropriately over the PICT. Waste generation varies between settlement types (urban/rural, main island/outer islands, etc.) and as these settlements are distributed uniquely in each PICT it needs to be considered in the calculation. This will be addressed in Section 3.0 Analysis of KPI Results to provide more detail about how the calculation was addressed for each PICT.	**Per capita** – units measured in a per capita (i.e., per person) basis to allow for extrapolation over a national population. **Waste generation rate** – waste generation measured at the point of origin and includes all disposal pathways (formal collection, dumping, burning, burying or other means).
5. Municipal Solid Waste (MSW) composition (%)	**Household waste audit** **Household Community Survey**	**MSW composition** The breakdown of the following waste materials by percentage: • Batteries • E-waste • Fishing • Glass • Hazardous • Hygiene • Metals • Organics • Other • Paper and cardboard • Plastics • Single-use This calculation needs to consider the locations where compositional waste audits were undertaken to apply the audit results appropriately over the PICT. Waste generation varies between settlement types (urban/rural, main island/outer islands, etc.) and as these settlements are distributed uniquely in each PICT it needs to be considered in the calculation. This will be addressed in Section 3.0 Analysis of KPI Results to provide more detail about how the calculation was addressed for each PICT.	**Municipal Solid Waste** (MSW) – waste originating from the public (typically managed by local government entities) and excludes commercial waste.
6. Household waste capture rate (%)	**Household waste audit** **Household Community Survey** **Census data**	**Household waste capture rate** Calculated using the below formula: $\frac{Tonnes\ per\ annum\ of\ waste\ captured\ responsibly}{Tonnes\ per\ annum\ of\ waste\ generated}$ This calculation needs to consider the locations where compositional waste audits and surveys were undertaken to apply the audit results appropriately over the PICT. Waste generation and access to formal waste management services vary	**Capture rate** – the proportion of total waste generated that is successfully captured and disposed of or recovered in an environmentally responsible manner. Waste capture can

KPI	Data Source/s	Formula and Notes	Definitions
		between settlement types (urban/rural, main island/outer islands, etc.) and as these settlements are distributed uniquely in each PICT it needs to be considered in the calculation. This will be addressed in Section 3.0 Analysis of KPI Results to provide more detail about how the calculation was addressed for each PICT.	include: • Waste collected by a household collection service. • Waste that is self-hauled to a licensed waste disposal facility. • Materials that are source separated and diverted to a recovery facility.
7. Household collection service coverage (%)	**Household Community Survey** **Census data** **Waste department records** (for validation)	**Household collection service coverage** Calculated using the below formula: $\frac{Number\ of\ people\ surveyed\ with\ access\ to\ a\ service}{Total\ number\ of\ people\ surveyed}$ This calculation needs to consider the locations where compositional surveys were undertaken to apply the results appropriately over the PICT. Access to waste services varies between settlement types (urban/rural, main island/outer islands, etc.) and as these settlements are distributed uniquely in each PICT it needs to be considered in the calculation. This will be addressed in Section 3.0 Analysis of KPI Results to provide more detail about how the calculation was addressed for each PICT.	• **Collection service** – a waste collection, transportation, and disposal service for household waste. Collection services can be either a house-to-house kerbside collection or community drop-off point. It is a requirement that the collection service be: • Regular – services are provided consistently in a way the does not lead to negative

KPI	Data Source/s	Formula and Notes	Definitions
			environmental impacts or disrupted engagement. • Accessible – drop-off points should be close to households included in the service. • Affordable – if the service is user-pay, then it should be priced in a manner that is affordable to the target population. **Coverage** – the proportion of the total households that have access to a regular waste collection service.
8. Fulfilment of MEA reporting requirements (%)	**Policy Survey**	**Fulfilment of MEA reporting requirements** Calculated using the below formula: $\frac{Number\ of\ satisfactorily\ completed\ reports}{Total\ number\ of\ reports\ required}$	**Fulfilment** – to satisfy the condition of a reporting requirement to be fulfilled, it must: • Delivered on time (whether by a specific deadline or at a regular reporting interval) • Presented in the required format and units of measurement. • Utilise the correct information portal or platform for reporting.

KPI	Data Source/s	Formula and Notes	Definitions
			• Be based on accurate data collection methods. **Multilateral environmental agreement** (MEA) – agreements between countries, usually taking the form of international conventions that strive to protect the environment through the implementation of actions to meet specific environmental goals. Some MEAs have obligations which are legally binding. **Reporting requirements** – MEAs often require member nations to regularly report implementation plans, progress reports, and other information to the authoritative body of the MEA.

5.2.2 Calculations for Supplementary KPIs

KPI	Data Source/s	Formula	Relevant Definitions and Notes
1. Cost of disposal to landfill ($/tonne/annum)	**Waste Facility Register**	**Cost of disposal to landfill** Calculated in two steps, first using the below formula for each separate landfill: $$\frac{\textit{Annual facility operating cost}}{\textit{Tonnes per annum of waste disposed to landfill}}$$ Secondly, calculating the national weighted average according to their proportional contribution to the total weight of waste disposed nationally. This will be addressed in Section 3.0 Analysis of KPI Results to provide more detail about how the calculation was addressed for each PICT.	**Cost of disposal** – a measure of a facility operating cost incurred for the disposal of every tonne of material that is sent to landfill. This does not measure the 'gate fee' charged by landfill facilities, which may include additional profit margins charged to customers. **Landfill** – a waste disposal facility that primarily relies on burying of waste (includes both licensed and unlicensed facilities above the minimum processing threshold).
2. Weight of waste disposed (tonnes per annum)	**Waste Facility Register** **Conversion factors**	**Weight of waste disposed** The total weight in tonnes of waste that is disposed in all landfills across the PICT. Where facilities do not have a weighbridge conversion factors can be used. Where the Waste Facility Register is incomplete landfill audit activities can be used for validation.	**Disposed** - waste that is appropriately collected and landfilled, as opposed to waste which gets dumped, burned, buried, littered, or otherwise.
3. Weight of waste recovered (tonnes per annum)	**Waste Facility Register**	**Weight of waste recovered** The total weight in tonnes of waste that is disposed in all recovery facilities across the PICT. Where facilities do not have a weighbridge conversion factors can be used. Excludes informal waste recovery activities that take place outside of waste facilities, such as small-scale organics recovery or specialty recycling.	**Recovered** - waste that is appropriately collected and diverted from landfill through: • Dry recycling – the separation and reprocessing of dry recyclables including paper, cardboard, metal, and certain plastics. • Organics recovery – the mulching or composting of mixed organics to produce new products. • Energy recovery

KPI	Data Source/s	Formula	Relevant Definitions and Notes
			– waste processing that allows for the capture and reuse of energy.
4. Volume and type of stockpiled hazardous waste (m^3)	**Waste Facility Register** **Alternative: Drones** to identify unreported stockpiles	**Volume and type of stockpiled hazardous waste** The volume in cubic metres (m^3) for each hazardous waste stream: • Asbestos • E-waste • Healthcare and pharmaceutical waste • Used oil • Used tyres • Obsolete chemicals.	**Stockpile** – an accumulation of materials over a specified quantity and time, held in reserve or storage, that typically occurs during: • Temporary storage until enough material is accumulated to treat or dispose of it efficiently. • Temporary storage while commodity prices are low, until the value of the recovered materials rises. • Inappropriate and permanent waste disposal. **Type of Hazardous waste** – waste or waste products that present a risk to environmental or human health, either now or in the future.
5. Marine plastic pollution potential (tonnes per annum)	**Household waste audit** **Household Community Survey** **Census data**	**Marine plastic pollution potential** Calculated in two steps, first quantify the weight of waste in tonnes per annum that is mismanaged using **KPI 4 Rate of household waste generation** and **KPI 6 Household waste capture rate:** Mismanaged waste = $\boldsymbol{KPI\ 4} \times population \times (1 - \boldsymbol{KPI\ 6})$ Secondly, estimating the amount of plastic that has the potential to become marine pollution using the composition of plastic as a percentage (%) identified in **KPI 5 MSW Composition:** Marine plastic pollution potential = $Mismanaged\ waste \times plastic\ composition\ (\%)$	**Marine plastic pollution** – Waste plastics which are not managed in an environmentally sound manner, hence have a risk of polluting oceans and estuarine waterways. The KPI scope only considers macroscopic plastic waste (i.e., plastic that can be identified visually through compositional audits) originating from household sources.

KPI	Data Source/s	Formula	Relevant Definitions and Notes
			Potential – a theoretical estimate of the potential weight of plastic that ends up in the ocean annually.
6. Awareness and support of waste management services (%)	**Household Community Survey**	**Awareness and support of waste management services** Calculated using the below formula: $$\frac{Number\ of\ positive\ responses}{Number\ of\ available\ services\ \times Number\ of\ participants}$$	**Awareness** – based on responses from the community awareness survey, the extent to which knowledge of waste management services is common in a community or on the country level. **Waste management services** – Services available to the public for waste management, including: • Access to waste collection services. • Access to waste drop-off points. • Availability of local recycling services. • Availability of local composting services.
7. Proportion of strategic waste management initiatives implemented (%)	**Policy Survey**	**Proportion of strategic waste management initiatives implemented** Calculated using the below formula: $$\frac{Number\ of\ initiatives\ implemented\ nationally}{Number\ of\ planned\ initiatives\ national\ +\ regional}$$	**Strategic waste management initiatives** – Actions (usually in the form of projects, policy interventions or new regulation) that are established by national and regional waste strategies. **Implemented** – successfully executed actions that are delivered during the reporting period.
8. Commercial waste capture	**Commercial waste**	**Commercial waste capture rate** Calculated using the below formula:	**Capture rate** – the proportion of total commercial waste

KPI	Data Source/s	Formula	Relevant Definitions and Notes
rate (%)	**audit** **Commercial Community Survey** **National commercial information** (i.e. number, types, and geographic distribution of businesses across the PICT)	$\frac{\textit{Tonnes per annum of waste captured responsibly}}{\textit{Tonnes per annum of waste generated}}$ This calculation needs to consider the locations where compositional waste audits and surveys were undertaken to apply the audit results appropriately over the PICT. Waste generation and access to formal waste management services vary between settlement types (urban/rural, main island/outer islands, etc.) and as these settlements are distributed uniquely in each PICT it needs to be considered in the calculation. This will be addressed in Section 3.0 Analysis of KPI Results to provide more detail about how the calculation was addressed for each PICT.	generated that is successfully captured and disposed of or recovered in an environmentally responsible manner. Waste capture can include: - Waste collected by a commercial collection service or that is self-hauled to a licensed waste disposal facility. - Materials that are source separated and diverted to a recovery facility
9. Commercial collection service coverage (%)	**Commercial Community Survey** **National commercial information** (i.e. number, types, and geographic distribution of businesses across the PICT)	**Commercial collection service coverage** Calculated using the below formula: $\frac{\textit{Number of people surveyed with access to a service}}{\textit{Total number of people surveyed}}$ This calculation needs to consider the locations where compositional surveys were undertaken to apply the results appropriately over the PICT. Access to waste services varies between settlement types (urban/rural, main island/outer islands, etc.) and as these settlements are distributed uniquely in each PICT it needs to be considered in the calculation. This will be addressed in Section 3.0 Analysis of KPI Results to provide more detail about how the calculation was addressed for each PICT.	**Collection service** – a waste collection, transportation, and disposal service for commercial waste. Collection services can be either a provided as a kerbside collection or as a designated drop-off point. It is a requirement that the collection service be: • Regular – services are provided consistently in a way the does not lead to negative environmental impacts or disrupted engagement. • Accessible – drop-off points should be close to businesses included in the service. – • Affordable – if the service is user-pay, then it should be priced

KPI	Data Source/s	Formula	Relevant Definitions and Notes
			in a manner that is affordable to the target businesses. **Coverage** – the proportion of the total businesses that have access to a regular waste collection service.
10. Total weight of disaster waste disposed (tpa)	**Waste Facility Register** **Alternative : Datasets** collected not yet reported to the Waste Facility Register **Alternative : Drones** to identify unreported stockpiles	**Total weight of disaster waste disposed** Calculated as the sum of weight of disaster waste (tonnes) landfilled or received at a waste disposal facility in a country following disaster events.	**Weight** – measured as a weight-based summation of all waste facilities. **Disaster Waste** – Large quantities of waste caused by disasters. **Disposed** - waste that is appropriately collected and landfilled, as opposed to waste which gets dumped, burned, buried, littered, or otherwise.

6 References

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