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.**

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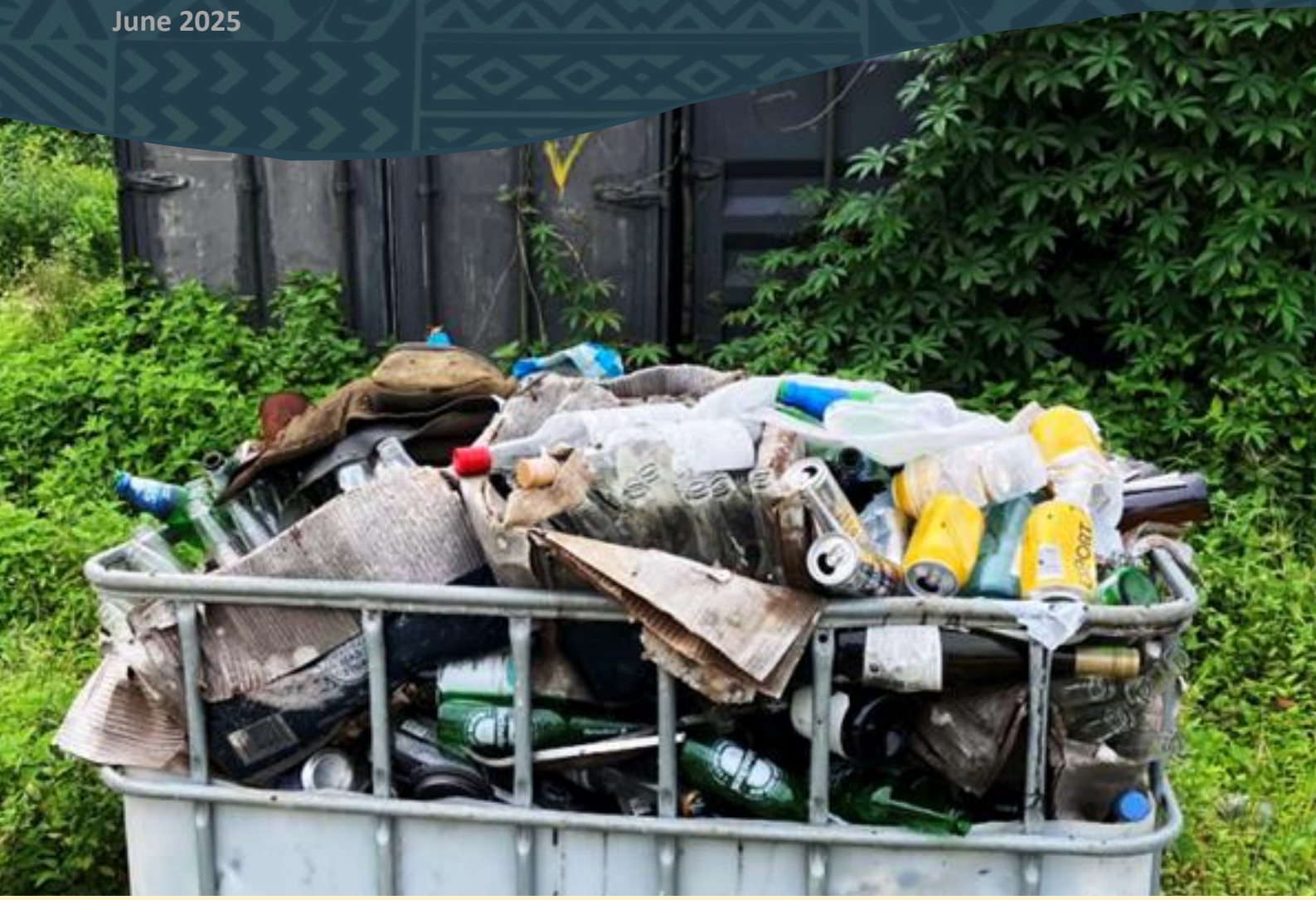
Niue National Waste Audit Analysis Report

June 2025



This Waste data collation, analysis and reporting for the Niue 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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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

EUROPEAN UNION

SPREP Secretariat of the Pacific Regional Environment Programme

PacWastePlus PACIFIC WASTE MANAGEMENT

www.pacwasteplus.org

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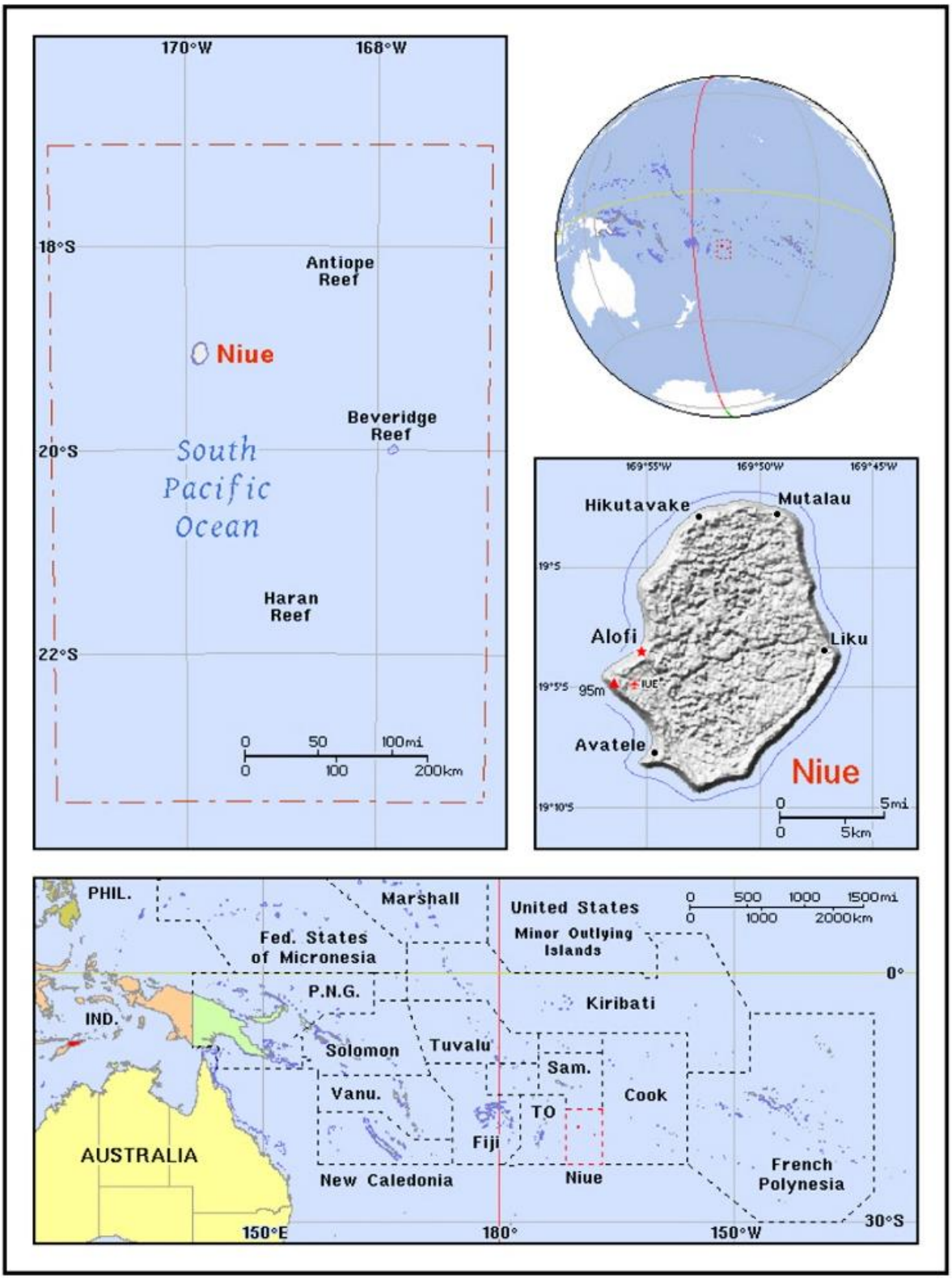
Map of Niue



Source: www.mapsland.com/oceania/niue

Glossary

Acronym	Definition
C&D	Construction and Demolition (Waste)
C&I	Commercial and Industrial (Waste)
CCM	Niue Catholic Church Mission
DCMR	Data Strategy & Collection, Monitoring, and Reporting (Framework)
DoE	Niue Department of Environment
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, 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 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.
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/recovery facilities for dry recyclables (and e-waste), organics recovery facilities, and waste-to-energy facilities.

Executive Summary

Waste data collation, analysis and reporting for the Niue 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 consistently and reliably across the Pacific.

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

Core KPIs	Result	Supplementary KPIs	Result
1. Count / capacity of modern waste facilities	0 / 0	1. Cost of disposal to landfill ($/annum)	US$50.05
2. Count / capacity of unregulated waste facilities	3 / Capacity unknown	2. Weight of waste disposed (tpa)	1,088
3. National recovery rate (%)	1.3	3. Weight of waste recovered (tpa)	14.6
4. Per capita waste generation rate (kg/capita/year)	88.5	4. Volume and type of stockpiled hazardous waste (m^3)	E-waste: 30 m3 Used oil: 33 m3 Obsolete chemicals: 7 m3 Other: 275 m3 (ELVs and ULABs)
5. Municipal Solid Waste (MSW) composition (%)	Figure (a)	5. Marine plastic pollution potential (tpa)	0.222
6. Household waste capture rate (%)	99%	6. Awareness and support of waste management services (%)	99%
7. Household collection service coverage (%)	99%	7. Proportion of strategic waste management initiatives implemented (%)	85%
8. Fulfillment of MEA reporting requirements (%)	20%	8. Commercial waste capture rate (%)	40%
		9. Commercial collection service coverage (%)	40%
		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.

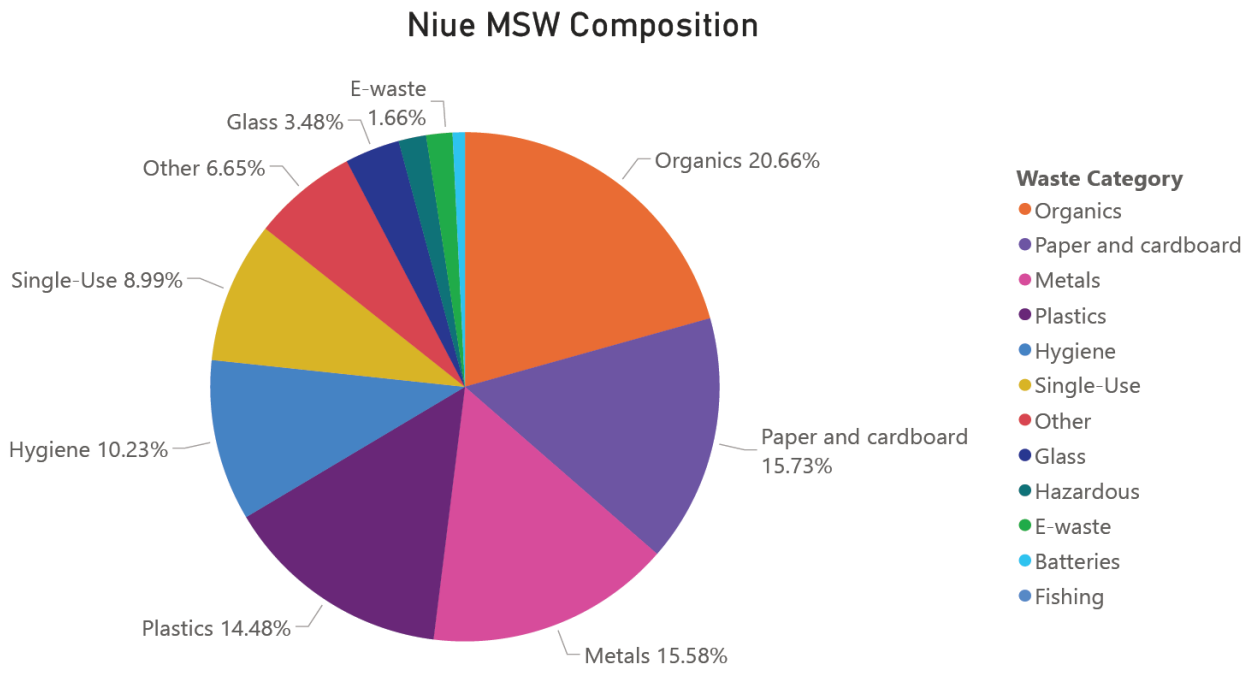


Figure (a) Niue Municipal Solid Waste (MSW) Composition (% by weight)

1 Introduction

1.1 Background

Niue is one of fifteen Pacific Island Nations participating in the PacWaste Plus Programme implemented through SPREP and funded by the European Union Delegation of the Pacific. The PacWaste Plus Programme aims to improve waste management activities across the islands and strengthen the capacity of Governments, industries, and communities to manage waste to protect human health and the environment.

Niue has a dedicated recycling collection program for residents and small commercial businesses. Collected materials are stockpiled or stored in cages at designated storage sites or at landfill for future sorting and processing at Niue's (planned) recycling facility. Collections of e-waste (including white goods and batteries) was being undertaken on a scheduled basis but is subject to funding availability and storage space is becoming limited. Additionally, a successful recycling program for aluminium cans is run by the Catholic Church Mission, incentivising community members to recycle by offering a buyback program. Niue otherwise relies on landfilling or burying, burning and dumping of wastes. Investment in infrastructure, implementation of data-guided decision making, and increased general waste management education will improve the current situation.

1.2 Purpose and aim

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

The aim of this report is to:

- Validate pre-existing national waste audit data;
- Collect additional data to inform data gaps from the Cook Islands 2023 National Waste Analysis Report; and
- Build national waste insights based on new key performance indicators (KPIs) to understand waste management trends.

The results presented in this report, and the other fourteen country waste data 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 Niue:

- **Niue waste audit 2021**: The audit was undertaken by Tonkin & Taylor International Limited between February and April 2021 and provided an evaluation of household and business waste generated in Niue. Audit data and information was obtained via interviews and waste collections from 104 households and 11 businesses, followed by sorting and weighing. The audit report also provided an assessment of the state of Niue's landfills including landfill audits and stockpile assessments.
- 2018 CLiP Cefas Waste Audits and Interviews
- 2023 Niue National Waste Audit Analysis Report
- 2025 Additional Data Collection and Waste Facility Register

This national report examines the MSW, commercial and industrial (C&I), disaster waste and landfill waste streams. Landfills may receive a broad array of waste types including construction and demolition (C&D) waste, hazardous waste, and other waste types in addition to MSW and C&I waste. As such, landfill waste is considered a separate waste stream.

The potential for marine plastic pollution is considered for macroscopic plastic waste (i.e. plastics that can be identified through compositional audits) originating from household sources. Accurate data on the amount and management of macroscopic plastic waste in the region is limited.

1.4 Country Overview

The Republic of Niue is a small island nation located in the South Pacific (a map is provided on page 4). The population of the island was last assessed in the 2017 Census to be 1,719 people. Niue's land area is about 261 square kilometres, and it is located in a triangle between Tonga, Samoa, and the Cook Islands. The languages spoken include Vagahau (Niuean) and English.

There is no specific waste management legislation in place for Niue, but there are a combination of laws and waste management protocols. For example, the *Environment Act 2015* sets out several waste-related activities that require development consent including landfills, recycling or collection stations, drainage or disposal systems, wastewater and sanitation schemes, and human waste disposal systems.

The Niue government developed the *National Integrated Waste Management Strategy 2010 – 2015* which provides analysis and context for local waste management. The strategy provides a framework for waste management in the country and aims to improve waste reduction, recycling, and disposal practices across the islands.

Implementation of the National Integrated Waste Management Strategy and accompanying Action Plan are now coordinated by the Niue Department of Environment (DoE).

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

- DoE: Responsible for designing and implementing programmes for waste management and pollution control, in collaboration with other departments. Their role also covers regulation and policy development, monitoring and enforcement, and operation (collection and disposal) for solid, liquid (including sludge) and hazardous wastes. In addition, the DoE are also responsible for monitoring and enforcement of medical waste management and recycling of solid waste.
- Department of Agriculture, Forestry and Fisheries: Responsible for regulation and policy development, monitoring and enforcement, and operation (collection and disposal) for quarantine wastes. Responsible for Stockholm Convention and Waigani Convention implementation.
- Department of Health: Responsible for medical waste regulation and policy development on the island.

Niue Catholic Church Mission (CCM) currently operates a recycling programme collecting aluminium cans for exporting to New Zealand. Niue Fo'ou Hospital is responsible for the collection and disposal of medical waste on the island.

2 Methodology

Waste data collation, analysis and reporting were 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 consistently and reliably 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	Notes
Niue Waste Audit report	2021	Nationwide	The quantitative audit sampled 104 households and 11 businesses. In addition, 99 households and 10 businesses were qualitatively interviewed.	Commercial and household compositional waste audits, commercial and household community surveys.	Commercial and household waste composition and qualitative survey responses.	Used to inform 2023 Niue National Waste Audit Analysis Report.
Niue National Waste Audit Analysis Report	2023	Nationwide	The National Waste Audit Analysis Report uses data from the Waste Audit Report outlined above.			
Waste Facility Register	2025	Nationwide	Three facilities.	Waste Facility Register distributed to the facilities.	Facility details.	Used to inform the 2025 Nauru National Waste Analysis Report.

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

- Household and business audits: A sample is the entire contents of a bin or bag/s put out for collection. The sample represents the waste produced by that household over one week. The audit methodology uses weight to determine composition rather than volume. The methodology does not include the identification of moisture content across different waste materials.
- Landfill audit: Waste composition and quantity were estimated, and loads recorded during the audit period. Each load was recorded including photographs and estimated composition and quantity. Assumptions were used for the typical density of waste categories.
- Stockpile assessments: Materials characteristics and quantity were estimated. Each stockpile was recorded including photographs and estimated composition and quantity. Assumptions were used for the typical weights of items identified in stockpile assessments.

2.3 Key Performance Indicators

The DCMR Framework introduces a series of KPIs (see Table 2). The KPIs were developed to guide data analysis to improve 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; and,
- 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 to calculate 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	

Legend

Calculated with Additional Data	Calculated in Previous Report	No data

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

In the future, improved data capture and data quality will benefit performance assessment by reducing the extent to which assumptions and substitutions are necessary. In turn, the KPIs will reflect a more accurate depiction of the status of waste management in Niue.

3.2 KPI Reporting Results

The following section presents 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 Niue to compare future data 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: 0** • None of Niue's facilities can be considered modern, and thus the capacity is also 0 **Capacity of modern waste facilities (tonnes per annum): 0**
Assumptions	None
Data gaps	None
Key considerations	• There are no facilities that meet "modern" standards • A recycling facility is under construction, which provides an opportunity to ensure safe management of recovered wastes by "modern" standards

Core KPI 2: Count / capacity of unregulated waste facilities

Result	**Count of unregulated waste facilities**: **3** • Niue has three waste facilities comprising: – Makato landfill – Vaiea landfill – CCM aluminium can processing **Capacity of unregulated waste facilities (tonnes per annum): No data**
Assumptions	There are two dumpsites that are no longer operational and therefore not included in the count of facilities (Huihui and Mutalau)
Data gaps	Data on capacity was not available for any facility
Key considerations	• The Niue National Resource Recovery Centre is under construction and not yet included in the count.

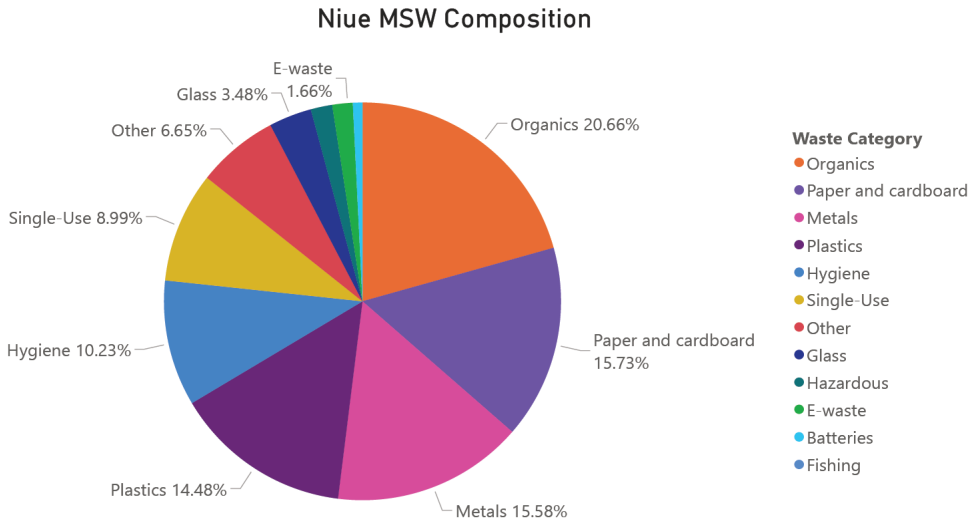
Core KPI 3: National recovery rate

Results	**National recovery rate (%): 1.32** • Aluminium cans are exported for recycling by the CCM
Assumptions	• Assumes the shipping container is 20 ft, with a volume of 33.2 m3 for one shipping container. Assumes two full shipping containers per year. • Assumes a density of 139 kg/m3 for aluminium cans (based on material density conversions provided by the Australian NSW EPA).
Data gaps	• Data on the tonnage of aluminium recovered by the CCM was not available. Estimates were based on data previously obtained during the 2021 audit.
Key considerations	• A recycling facility is under construction and, once operational, will increase the quantity of recovered material significantly.

Core KPI 4: Per capita waste generation rate

Results	**Per capita waste generation rate (kg/capita/year): 88.5** – kg/capita/day: 0.242 – kg/household/day: 0.800
Assumptions	• Household waste audit data was converted from a per household basis to a per capita basis and extrapolated using census data of the national population. • A total of 104 households were sampled during the household waste audits. • Relies on census data from the Niuean national census of 2017: – Population data; – Number of households; and – Household size.
Data gaps	• None
Key considerations	• Future per capita waste generation rates will provide insight into waste management trends and changes for Niue and allow for comparison within Niue and the region.

Core KPI 5: Municipal Solid Waste (MSW) composition

Results	Organic waste is the most prevalent waste type for household waste in Niue. This is followed by paper and cardboard, and metals. • Organics: 20.66.% • Paper and Cardboard: 15.73% • Metals: 15.58%  Figure 1 Niue Municipal Solid Waste (MSW) composition (% by weight)
Assumptions	None
Data gaps	• The categories presented are based on the PRIF waste audit guidelines. Past audits may record different categories.
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 (%): 99%** – Total weight of household waste generated = 152 tpa – Total weight of household waste captured responsibly = 151 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: $$total\ household\ waste\ generated\ (tpa) = average\ waste\ generation\ rate\ of\ location\left(\frac{\frac{kg}{capita}}{year}\right) \times location\ population$$
Data gaps	• The audit and conducted survey did not capture: – Information to quantify each household's disposal method; and – The weight of waste captured by management services.
Key considerations	• It is estimated that the majority of household waste generated in Niue is captured by waste management services. This includes landfill drop-off. • Interview responses during the 2021 audit indicated that illegal dumping is still practiced in Niue.

Core KPI 7: Household collection service coverage

Results	**Household collection service coverage (%): 99%** • Based on interviews conducted during the audit, the household collection coverage for Niue was 98.99%. • This takes into account both the government's free collection service and independent drop off of household wastes to landfill. • During interviews, residents conveyed a desire for a bulky waste collection service and a desire for larger recycling bins(current bins are 20-litre).
Assumptions	• This performance indicator has been calculated based on information from 2017 census data: – Number of households
Data gaps	• None
Key considerations	• It is estimated that the majority of households in Niue have access to collection services. This includes kerbside and independent drop off to landfill by residents.

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

Results	**Fulfillment of MEA reporting requirements (%): 20.0%**			
	Convention	**Status**	**Reporting requirements**	**Reports delivered**
	Stockholm Convention	Ratified	5 reporting cycles (5)	1
	• Niue is party to the Stockholm Convention, achieving ratification status in 2005. It has only delivered its national implementation plan.			
Assumptions	• Conventions without mandatory reporting requirements were not included in the calculation of this KPI.			
Data gaps	None			
Key considerations	• Niue is behind on the required MEA reports for the agreements of which it is party to.			

Supplementary KPI 1: Cost of disposal to landfill

Results	**Cost of disposal to landfill ($/tonne): US$50.05** • Data provided to Eunomia in the 2025 work suggests an operating cost of NZ$90,000 across both Makato and Vaiea landfills. • The 2021 audit indicates 1,088 tpa across both landfills.
Assumptions	• Only operating cost could be provided for the most recent year • Assumes tonnage disposed at across both landfills based on data made available in the 2021 audit
Data gaps	• Recent tonnage disposed at Makato and Vaiea landfills
Key considerations	• None

Supplementary KPI 2: Total weight of waste disposed

Results	**Total weight of waste disposed (tonnes per annum): 1,088**
Assumptions	• Only Vaiea and Makato landfill waste disposal estimates were used to report for this performance indicator. The amount of waste entering Huihui and Mutalau is not expected to change this KPI result to a significant extent.
Data gaps	• None
Key considerations	• None

Supplementary KPI 3: Total weight of waste recovered

Results	**Total weight of waste recovered (tonnes per annum): 14.61** • Currently, a recycling programme for aluminium cans is run by the CCM. The CCM buys cans from the public at NZ $0.10 which are then sold to the government for NZ $0.12 per can. These cans are stored in shipping containers for export to New Zealand. It can take up to 6 months to fill one container for export. Aluminium cans nonetheless remain common in household waste collections in Niue
Assumptions	• Assumes the shipping container is 20ft, with a volume of 33.2 m3 per shipping containers. • Assumes two full shipping containers per year • Assumes a density of compressed aluminium cans at 220 kg/m3 (Australian EPA)
Data gaps	• Data on the tonnage of aluminium recovered by the CCM was not available. Estimates were based on data previously obtained during the 2021 audit.
Key considerations	• A recycling facility is under construction and, once operational, will increase the quantity of recovered material significantly.

Supplementary KPI 4: Volume and type of stockpiled hazardous waste

Results	**Volume and type of stockpiled hazardous wastes (m^3):** – Asbestos: Insufficient data – E-waste: 30 m^3 – Healthcare and pharmaceutical waste: No data – Used oil: 33 m^3 – Used tyres: No data – Obsolete chemicals: 7m^3 – Other: 275m^3 (ELV and ULABs) A total of 345m^3 of stockpiled hazardous wastes in Niue
Assumptions	None
Data gaps	• An estimated 3,650 m2 of asbestos was previously removed from Niue High School and buried. This was not converted to a volume given a lack of data. There remain 347 houses on the island with asbestos roofing. Many of these houses were left empty after Cyclone Heta (2004) but are still dangerous to the community. No estimate of associated asbestos waste amounts was made available.
Key considerations	• The "other" hazardous waste is comprised of 200 m3 of ELVs and 15 m3 of ULABs at the Makato landfill, and 60 m3 ULABs at the Resource Recovery Centre • Previous stockpiles of hazardous waste (such as e-waste) at the landfills have been transported to the Resource Recovery Centre awaiting export once the facility becomes operational

Supplementary KPI 5: Marine plastic pollution potential

Results	**Marine plastic pollution potential (tonnes per annum): 0.222**
Assumptions	• Assumes a national weight of mismanaged waste, based on household audit samples. – 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	• The results suggest that the potential for marine plastic pollution is low, while the waste capture rate and collection service coverage is high. • Waste plastics which are not managed in an environmentally sound manner are likely to pose a significant risk of polluting oceans and estuarine waterways.

Supplementary KPI 6: Awareness of waste management services

Results	**Awareness of waste services (%): 99**
Assumptions	None
Data gaps	• Of the 99 households interviewed, 98 responded positively indicating awareness of waste collection services
Key considerations	• None.

Supplementary KPI 7: Proportion of strategic waste management initiatives implemented

Results	**Proportion of waste management initiatives implemented (%): 85.00%** – Number of successfully implemented initiatives = 17 out of 20 – Number of planned/pipeline initiatives = 3 • Implemented initiatives include: – National Integrated Waste Management Strategy 2010-2015 – National Strategic plan 2016-2026 – Sustainable Coastal DevelopmentPpolicy 2008 • Pipeline initiatives include: – Ratification of waste-related MEAs – Niue waste recycling facility – Single-use plastics ban
Assumptions	None
Data gaps	None
Key considerations	• There is currently no specific waste management legislation in place in Niue. • Niue's *Environment Act 2015* covers waste management activities that require development consent such as landfills, recycling facilities, wastewater systems, and human waste disposal systems. • It is predicted that Niue's planned waste recycling facility will significantly change waste management on the island. The facility was due to be operational by the end of 2019 however it is unclear whether the facility has become operational due to limited supporting legislation in place. – The Niue government tendered the development of the recycling centre in late 2020.

Supplementary KPI 8: Commercial waste capture rate

Results	**Commercial waste capture rate (%): 40%** • Commercial waste from small businesses (or commercials) on the island is collected on the same collection round as household waste and dropped off directly at Makato Landfill. There is no cost associated with this collection for commercials. The cost is covered by Government. • Larger commercials transport their waste directly to landfill sites or in addition to standard collection days if large quantities are produced. Commercials are not required to pay for the disposal of waste, regardless of the volume. • This KPI is measured as the fraction of the total waste captured through formal waste management services over the total waste generated by businesses.
Assumptions	• The average weight of commercial samples was 27 kg/per business/week. • An estimated 50 businesses were present in Niue during the time of the audit. – Results in a commercial waste generation rate of 70.2 tonnes per annum. • With a commercial service coverage of 40%, the capture rate is 28.1 tonnes per annum.
Data gaps	• Quantification of alternative disposal methods such as disposal to drop-off points or direct transport of commercial waste to landfill. • Commercial waste generation rates by business type.
Key considerations	• 28.1 tonnes of commercial waste (i.e. 40% of a total of 70.2 tonnes) per annum is captured by waste management services.

Supplementary KPI 9: Commercial collection service coverage

Results	**Commercial collection service coverage (%): 40%** • 10 businesses across Niue were interviewed during the audit. • Based on the interviews conducted, 40% of businesses in Niue have access to some form of collection service. • The audit report estimates that 50 businesses were present in Niue at the time of the audit.
Assumptions	• The sample size of 10 businesses allows adequate representation of Niue's commercial collection service coverage on the national level.
Data gaps	• No information on service coverages or number of participating businesses beyond the conducted surveys were identified.
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 will provide more data on 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**
Assumptions	• No disaster waste was recorded at any facility due to no natural disasters occurring in the past year.
Data gaps	• None
Key considerations	• None

4. Conclusion

This report provides several key updates to the 2023 Niue National Waste Analysis Report, including:

- Data on stockpiled hazardous waste has been updated to reflect the recent changes to stockpiles
- Increased granularity of the MSW composition is provided
- Updated data has been provided on the operational costs of the two landfills
- Calculations of awareness and support of waste management services, commercial capture rate, and commercial collection service coverage is completed
- The completion of the Resource Recovery Facility that is currently under construction will provide huge opportunity for Niue to improve its recycling rate, which is currently minimal with only very small scale aluminium can processing taking place.

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 Niue. An ideal sample would cover 100 households and businesses.	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] An ideal sample would cover 100 households.	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 Niue. An ideal sample would cover 20 businesses.	Every five years.
Commercial Compositional	**KPI 4** Per capita waste generation rate **KPI 5** Municipal solid waste (MSW)	The Commercial Compositional Waste Audit is a sort and weigh audit undertaken according to the Waste	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
Audit	composition **SKPI 5** Marine plastic pollution potential.	Audit Methodology: A Common Approach. An ideal sample would cover 20 businesses.	
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

5.3 KPI Calculations

5.3.1 Core KPI Calculations

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 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:	**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

KPI	Data Source/s	Formula and Notes	Definitions
		of energy. $\frac{Tonnes\ per\ annum\ of\ target\ waste\ stream\ recovered}{Tonnes\ per\ annum\ of\ target\ waste\ stream\ generated}$ • Where facilities do not have weighbridges conversion factors can be applied to convert volume (m^3) to tonnage (t).	
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	**Municipal Solid Waste** (MSW) – waste originating from the public (typically managed by local government entities) and excludes commercial waste.

KPI	Data Source/s	Formula and Notes	Definitions
		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.	
6. Household waste capture rate (%)	**Household waste audit** **Household Community Survey** **Census data**	**Household waste capture rate** Calculated using the below formula: $\frac{\textit{Tonnes per annum of waste captured responsibly}}{\textit{Tonnes per annum of waste generated}}$ 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.	**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 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: $\frac{\textit{Number of people surveyed with access to a service}}{\textit{Total number of people surveyed}}$ 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 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 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

KPI	Data Source/s	Formula and Notes	Definitions
			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. • 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.

5.3.2 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 – waste

KPI	Data Source/s	Formula	Relevant Definitions and Notes
			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. **Potential** – a theoretical

KPI	Data Source/s	Formula	Relevant Definitions and Notes
			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 rate (%)	**Commercial waste audit**	**Commercial waste capture rate** Calculated using the below formula:	**Capture rate** – the proportion of total commercial waste generated that is

KPI	Data Source/s	Formula	Relevant Definitions and Notes
	Commercial Community Survey **National commercial information** (i.e. number, types, and geographic distribution of businesses across the PICT)	$\frac{Tonnes\ per\ annum\ of\ waste\ captured\ responsibly}{Tonnes\ per\ annum\ of\ waste\ generated}$ 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 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.	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: $\frac{Number\ of\ people\ surveyed\ with\ access\ to\ a\ service}{Total\ number\ of\ people\ surveyed}$ 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 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 in a manner that

KPI	Data Source/s	Formula	Relevant Definitions and Notes
			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.

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