



**SPREP**  
Secretariat of the Pacific Regional  
Environment Programme



This initiative is supported by **PacWastePlus**-a 72 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.**

# Nauru National Waste Audit Analysis Report

August 2023



This Waste data collation, analysis and reporting for the Nauru 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



[www.pacwasteplus.org](http://www.pacwasteplus.org)

# Table of Contents

Map of Nauru .....	5
Glossary .....	6
Executive Summary .....	7
1 Introduction .....	9
1.1 Background .....	9
1.2 Purpose and aim .....	9
1.3 Scope .....	9
1.4 Country overview .....	10
2 Methodology .....	11
2.1 Data sources .....	11
2.2 Data analysis .....	12
2.3 Key performance indicators .....	13
3 Audit analysis results .....	14
3.1 Summary of data availability .....	14
3.2 KPI reporting results .....	15



# Map of Nauru



Source: GISGeography, 2022

# Glossary

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

Terminology	Definition
<b>Capacity</b>	The total maximum waste storage and processing that can take place at a facility (as capped by license conditions).
<b>Capture rate</b>	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)
<b>Coverage</b>	The proportion of total households that have access to a regular waste collection service.
<b>Modern</b>	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.
<b>Per capita</b>	Units measured on a per person basis (i.e. to allow for extrapolation over a national population).
<b>Recovery</b>	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.
<b>Unregulated</b>	Typically, unlicensed waste facilities which do not follow international frameworks, rules, and guidelines to protect the health of the environment and community.
<b>Waste facility</b>	'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 Nauru 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 Nauru

Core KPIs	Result	Supplementary KPIs	Result
1. Count / capacity of modern waste facilities	0 / 0	1. Cost of disposal to landfill (\$/annum)	AUD \$47.65 (US \$31.77)
2. Count / capacity of unregulated waste facilities	1 / Capacity unknown	2. Weight of waste disposed (tpa)	15,702
3. National recovery rate (%)	No data	3. Weight of waste recovered (tpa)	No data
4. Per capita waste generation rate (kg/capita/year)	49.0	4. Volume and type of stockpiled hazardous waste (m <sup>3</sup> )	See Section 3.2
5. Municipal Solid Waste (MSW) composition (%)	See Figure (a)	5. Marine plastic pollution potential (tpa)	10.1
6. Household waste capture rate (%)	86.0%	6. Awareness and support of waste management services (%)	No data
7. Household collection service coverage (%)	86.0%	7. Proportion of strategic waste management initiatives implemented (%)	84.21%
8. Fulfillment of MEA reporting requirements (%)	14.76%	8. Commercial waste capture rate (%)	See Section 3.2
		9. Commercial collection service coverage (%)	29.00%
		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.

### Legend

Sufficient data	Limited data	No data
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## Nauru MSW Composition

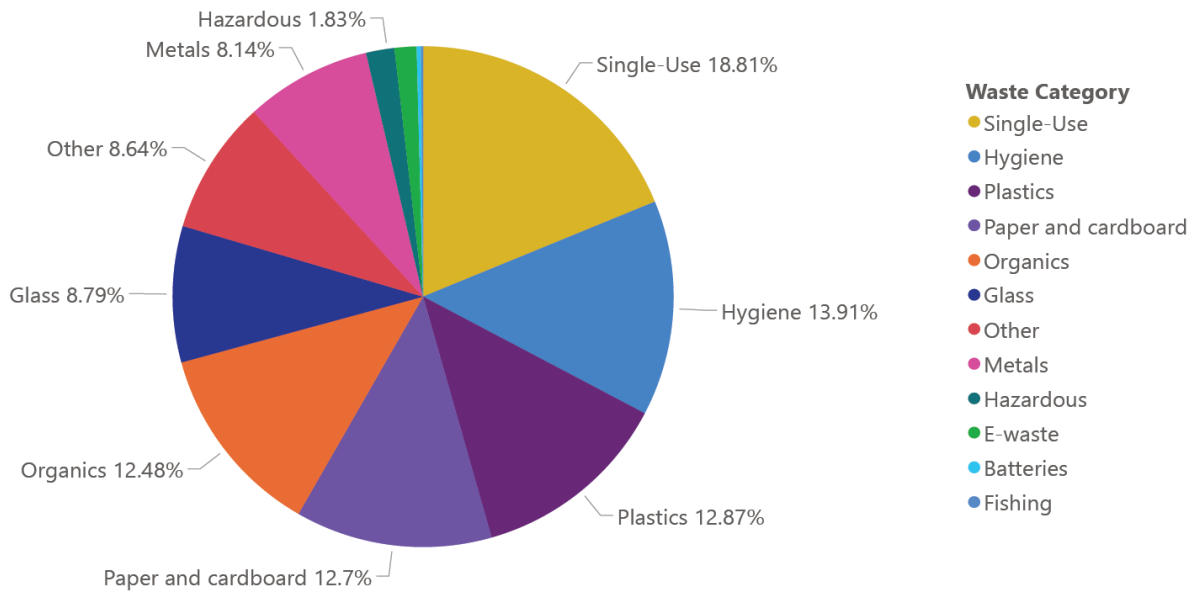


Figure (a) Nauru Municipal Solid Waste (MSW) Composition (% by weight)





# 1 Introduction

## 1.1 Background

Nauru is one of fifteen Pacific Island Nations which took part 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.

Nauru's waste management practices 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. Currently, there is no collection service for recyclables in the country, but there are plans to design and implement one. There is some separation of recyclable materials at the Nauru waste facility with tyres and metals stockpiled, and mulched organics and shredded cardboard reused by locals on plantations or farms.

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 Nauru's waste data and waste management systems.

The aim of this report is to:

- Validate pre-existing national waste audit data; 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 Nauru:

- **Nauru waste audit report 2020:** This audit was undertaken in December 2020 and provided an evaluation of household and business waste generated in Nauru. Audit data and information were obtained via interviews and waste collections from 75 households and 13 businesses, followed by sorting and weighing. The audit report also provided an assessment of the state of Nauru's waste facility including landfill audits and stockpile assessments.

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 types of waste 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 Nauru is a small coral island located in the southeast Pacific Ocean with a population of approximately 11,550 people and around 1,647 households. With only a 21 km<sup>2</sup> area, Nauru is the third-smallest country in the world behind Vatican City and Monaco, making it the smallest republic as well as the smallest island nation. The languages spoken include Nauruan and English.

There is no specific waste management legislation in place for Nauru. Instead, waste management falls under the umbrella of general environmental legislation and strategies for solid waste management, such as *Environmental Management and Climate Change Act 2020*, *National Solid Waste Management Strategy 2011-2020* and *Litter Prohibition Act 1983* etc.

- The responsibility for managing solid waste is divided among various institutions in Nauru, which include: the Department of Commerce, Industry and Environment responsible for planning and coordinating the development of the National Waste Management Policy Framework. In addition, it is also responsible for the management of hazardous waste.
- Department of Health: Administers the Litter Prohibition Act.
- Department of Finance and Economic Planning: Responsible for the Economic Infrastructure Strategy and Investment Plan 2011, which includes solid waste management infrastructure stocktake.

Nauru Rehabilitation Corporation (NRC) carried out the waste management programme for Nauru, including waste collection, disposal (operation of the Nauru dumpsite, herein referred to as the waste facility), composting and recycling.



## 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	Methods for data collation	Reported data
<b>Nauru waste audit 2020</b>	<ul style="list-style-type: none"> <li>• Sample collection from households and businesses</li> <li>• Sort and weigh household/business waste</li> <li>• Household and business interviews</li> <li>• Landfill audit</li> <li>• Stockpile assessment</li> </ul>	<ul style="list-style-type: none"> <li>• Access to household and business waste collection services</li> <li>• Household and business waste composition</li> <li>• Potentially recyclable materials from household waste</li> <li>• Stockpile types and quantities</li> <li>• Landfilled waste composition and weight</li> <li>• Customs data</li> </ul>
<b>2019 Nauru mini census</b>	<ul style="list-style-type: none"> <li>• National census</li> </ul>	<ul style="list-style-type: none"> <li>• Population data</li> <li>• Household data (size, number)</li> </ul>

#### 2.1.1 Nauru Waste Audit 2020

The waste audit was undertaken in December 2020 and utilised the Waste Audit Methodology produced by Pacific Regional Infrastructure Facility (PRIF).

Audit activities took place over one week across Nauru. The audit plan was developed based on the most recent household and commercial statistics from the Nauru Bureau of Statistics. A total of 88 household samples and 13 commercial samples were gathered. Of this total, 74 households and 17 commercials participated in interviews. Sampling methodologies differed by the type of collection service available to the sampled area. In addition, 88 loads were analysed during the landfill audit, and 43 stockpile assessments were conducted. The waste composition, recycling potential, hazardous waste status and future treatment options were audited for the NRC waste facility over one week.

### 2.1.2 Sample Locations

Table 2 Sample locations for audits

Sample Location	Population (2020)	Classification
Nauru	11,550	Urban and Peri-urban

## 2.2 Data Analysis

Each country's audit reports, audit data, and other data sources were inspected for relevant information which was subsequently collated into country-specific databases. These databases were then used to calculate the DCMR Framework KPIs. KPI reporting followed the calculation methodologies as detailed in the DCMR Framework.

The main assumptions made 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 their corresponding KPI in **Section 3.2**.

### 2.2.1 Main Assumptions

- Since the nation of Nauru consists of one small coral island, all samples taken during the audit are assumed to be representative of the entire country.
- All population estimates used to calculate performance indicators are based on national mini-census data from 2019, which predates the audit (completed in
- All waste plastics which are not managed in an environmentally sound manner are assumed to have the potential risk of polluting oceans and estuarine waterways.
- Commercial waste service coverage reporting has relied primarily on survey information conducted during audits of commercial business waste.



## 2.3 Key Performance Indicators

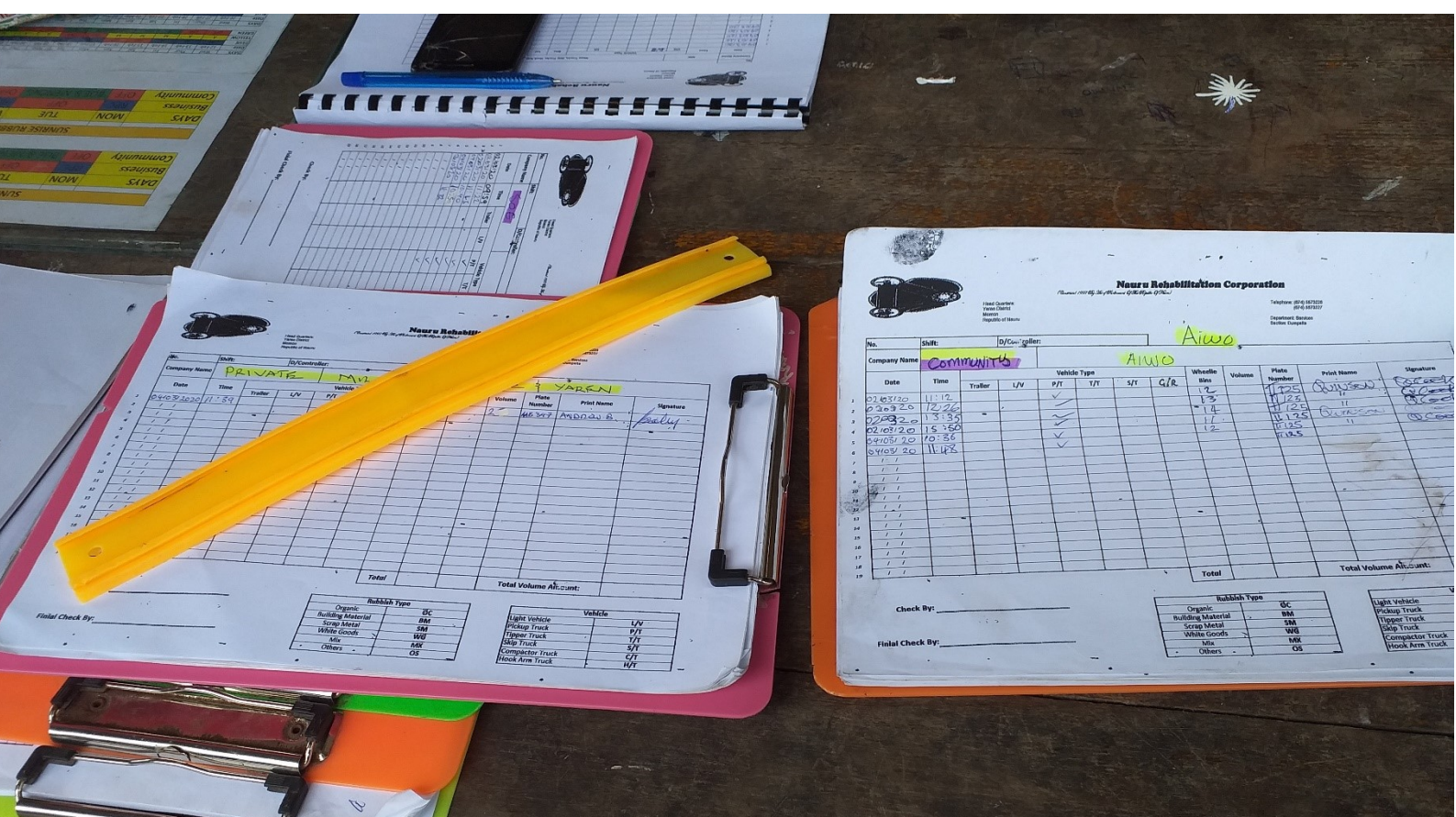
The DCMR Framework introduces a series of KPIs (see **Table 3**). The KPIs were developed to guide data analysis to improve the efficiency of data collection activities by building on pre-existing data collection practices across the region.

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 3 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		
Sufficient data	Limited data	No data

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

In summary:

- There was adequate data provided within the audit report to sufficiently calculate Core KPIs 4 to 8 and Supplementary KPIs 1, 2, 5, and 7.
- Limited data was provided within the audit report to calculate Core KPIs 1 and 2, and Supplementary KPIs 4, 8, and 9.
  - There was no data regarding the maximum processing capacity of the NCR waste facility (tonnes per annum), however, there was information regarding the equipment, staffing, leachate management and cover systems of the facility.
  - The audit found stockpiles of all hazardous waste categories targeted in the DCMR Framework except for healthcare and pharmaceutical waste. Stockpile weights were recorded and converted where feasible to volume. There are stockpiles of e-waste and used tyres on Nauru, but the volume was not recorded.
  - There was some information pertaining to the collection service coverage and waste capture rate for commercials presented in the audit report, however it is difficult to confidently extrapolate the results of the indicator to the national level due to data insufficiency. See **Section 3.2**
- No data was provided within the audit report to calculate Core KPI 3 or Supplementary KPI 3, 6, and 10.
  - Since Nauru has no official recycling system or infrastructure, it was not possible to determine the national rate of recovery, or the weight of waste recovered. No disaster waste amounts were reported as part of audits.

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 Nauru.

### 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 Nauru 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

<b>Result</b>	<p><b>Count of modern waste facilities: 0</b></p> <ul style="list-style-type: none"> <li>• Waste is collected and disposed of at the landfill by the NRC. The NRC manages and operates the Nauru waste facility (the only one on the island). <ul style="list-style-type: none"> <li>– The site is staffed and has access to equipment including an excavator.</li> <li>– There is minimal management of waste once placed. Black soil and road base are used intermittently as landfill cover when material and suitable equipment are available.</li> <li>– However, it is unlined with no leachate collection and no separation of stormwater. As such the landfill cannot be classified as a ‘modern’ facility under the definitions of the DCMR Framework.</li> </ul> </li> </ul> <p><b>Capacity of modern waste facilities (tonnes per annum): 0</b></p> <ul style="list-style-type: none"> <li>• Since the Nauru waste facility does not meet modern requirements, the capacity of ‘modern’ facilities is 0.</li> </ul>
<b>Assumptions</b>	<ul style="list-style-type: none"> <li>• None</li> </ul>
<b>Data gaps</b>	<ul style="list-style-type: none"> <li>• No estimates or parameters were used to calculate the maximum annual processing capacity (tpa) of the Nauru waste facility.</li> <li>• No information was reported on the total storage capacity of the site and if they are exceeding storage capacity.</li> </ul>
<b>Key considerations</b>	<ul style="list-style-type: none"> <li>• The Nauru waste facility is not up to ‘modern’ standards.</li> <li>• The lack of leachate management at the facility means that both the environment and community are at risk of hazards due to contamination and material flow.</li> <li>• The 2020 waste audit report noted that the facility had reached its full capacity in 2018. <ul style="list-style-type: none"> <li>– Materials have since been diverted away from landfill where possible to preserve the remaining air space.</li> </ul> </li> <li>• The number, location, name and operations of all landfills and dumpsites should be collated for future reporting purposes.</li> <li>• Investment to upgrade the existing landfill on Nauru to meet ‘modern’ standards / best practices will lead to better outcomes for the local environment and community health. <ul style="list-style-type: none"> <li>– Waste reduction and recovery may be the most beneficial waste management strategies for Nauru due to the limited space and resources available to the island.</li> </ul> </li> </ul>



## Core KPI 2: Count / capacity of unregulated waste facilities

<b>Result</b>	<p><b>Count of unregulated waste facilities: 1</b></p> <ul style="list-style-type: none"><li>• The Nauru waste facility does not meet the DCMR Framework requirements of a ‘modern’ facility and is therefore classified as ‘unregulated’.<ul style="list-style-type: none"><li>– There is no leachate management at the site.</li></ul></li></ul> <p><b>Capacity of unregulated waste facilities (tonnes per annum): No data</b></p>
<b>Assumptions</b>	<ul style="list-style-type: none"><li>• None</li></ul>
<b>Data gaps</b>	<ul style="list-style-type: none"><li>• No estimates or parameters were used to calculate the maximum annual processing capacity (tpa) at the facility.</li></ul>
<b>Key considerations</b>	<ul style="list-style-type: none"><li>• Nauru’s waste facility is classified as ‘unregulated’ as it lacks leachate management systems. Fires at the waste facility are common. The most recent reported fire in the report took place the same year as the audit in 2020. The facility is also at capacity.</li><li>• The unregulated status of the Nauru waste facility presents investment opportunities to upgrade or rehabilitate the site to align with best practices. Reducing the number of unregulated facilities will lead to better outcomes for the local environment and community health.</li></ul>







### Core KPI 3: National recovery rate

<b>Results</b>	<p><b>National recovery rate (%): No data</b></p> <ul style="list-style-type: none"> <li>• Potentially recoverable waste often arrives at the Nauru waste facility as part of the mixed waste stream and is not segregated.</li> <li>• Some organics and cardboard disposed of at the facility are mulched or shredded for reuse by the local community for a range of agricultural uses.</li> </ul>
<b>Assumptions</b>	<ul style="list-style-type: none"> <li>• None</li> </ul>
<b>Data gaps</b>	<ul style="list-style-type: none"> <li>• No data is collected on the amounts, weights or volumes of recoverable materials entering the Nauru waste facility.</li> </ul>
<b>Key considerations</b>	<ul style="list-style-type: none"> <li>• A national recovery rate is not able to be calculated as no official recycling takes place.</li> <li>• There are no significant government or private recycling operations in Nauru. <ul style="list-style-type: none"> <li>– There is currently no recycling collection service in place.</li> <li>– Recycling in Nauru consists of small-scale community not-for-profit recycling groups operating during events and special occasions.</li> <li>– Previous recycling activities in Nauru included the recycling of copper radiators and aluminium cans by an individual, but this no longer occurs.</li> </ul> </li> <li>• Community surveys highlighted that Nauruan households want to participate in recycling, but a lack of resources and capacity presents a significant challenge to establishing recycling on the island.</li> <li>• There is some capture of recyclable materials at the Nauru waste facility - tyres, metals, food and garden organics, and cardboard. Tyres and metals are stockpiled, while mulched organics and shredded cardboard are reused by locals in plantation areas or on farms.</li> <li>• There are plans in place by the NRC to commence a recycling collection service, waste segregation program, and recycling management system. Proposed materials for collection include: <ul style="list-style-type: none"> <li>– glass, by utilising a glass crusher to process glass bottles;</li> <li>– aluminium cans and plastic bottles, by introducing compactors at the facility; and</li> <li>– cardboard through continued use of an existing cardboard shredder to size reduce cardboard at the waste facility.</li> </ul> </li> <li>• There is a need for formal recovery infrastructure and strategy in Nauru, as all current recovery operations are informal.</li> <li>• A Nauruan recovery system would increase the waste recovery rate of Nauru and relieve pressure on the waste facility's remaining air space.</li> </ul>



#### Core KPI 4: Per capita waste generation rate

<b>Results</b>	<b>Per capita waste generation rate (kg/capita/year): 49.0</b> <ul style="list-style-type: none"><li>– kg/capita/day: 0.134</li><li>– kg/household/day: 0.899</li></ul>
<b>Assumptions</b>	<ul style="list-style-type: none"><li>• 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.</li><li>• A total of 88 households were sampled during the household waste audits.</li><li>• Audit samples are assumed to be representative of the entirety of Nauru.</li><li>• Relies on census data from the Nauru mini census of 2019:<ul style="list-style-type: none"><li>– Population data;</li><li>– Number of households; and</li><li>– Household size.</li></ul></li></ul>
<b>Data gaps</b>	<ul style="list-style-type: none"><li>• None</li></ul>
<b>Key considerations</b>	<ul style="list-style-type: none"><li>• The per capita waste generation rate for Nauru is 49.0 kg/capita/year.</li><li>• Future per capita waste generation rates will provide insight into waste management trends and changes for Nauru.</li></ul>





### Core KPI 5: Municipal Solid Waste (MSW) composition

#### Results

Single-use items are the most prevalent waste type for household waste in Nauru. This is followed by hygiene product waste, plastics, paper and cardboard and organics.

- Single-use: 18.81%
- Hygiene: 13.91%
- Plastics: 12.87%
- Paper and cardboard: 12.70%
- Organics: 12.48%

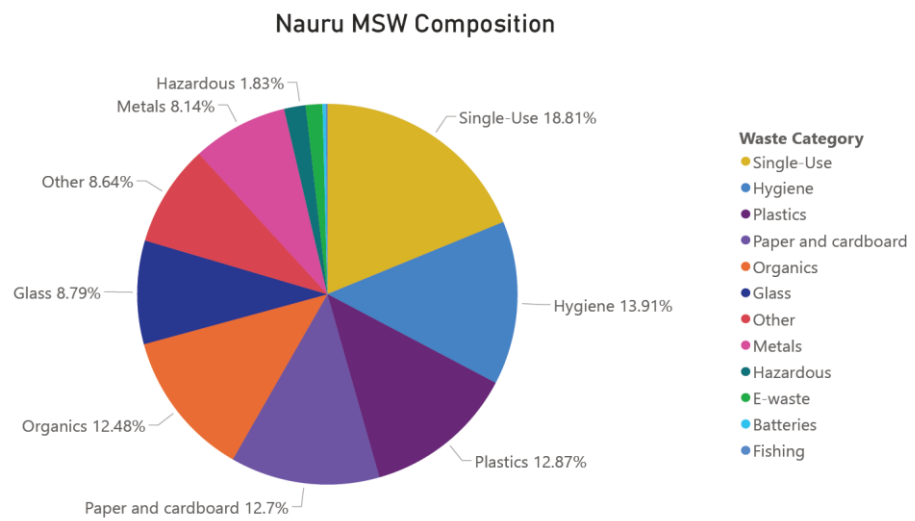


Figure 1 Nauru Municipal Solid Waste (MSW) Composition (% by weight)

#### Assumptions

- None

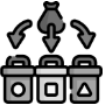
#### Data gaps

- The categories presented are based on the PRIF waste audit guidelines. Past audits may record different categories.

#### Key considerations

- 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.

**Note: Single Use includes beverage containers, cigarette butts, cigarette packets, straws, coffee cups, bags - heavy glossy typically branded carry bags, light weight carry bags, plastic takeaway containers, other EPS/Styrofoam, paper, bottle lids.**



**Core KPI 6: Household waste capture rate**

<b>Results</b>	<p><b>Household waste capture rate (%): 86.00%</b></p> <ul style="list-style-type: none"> <li>– Total weight of household waste generated = 566 tpa</li> <li>– Total weight of household waste captured responsibly = 487 tpa</li> </ul>
<b>Assumptions</b>	<ul style="list-style-type: none"> <li>• 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.</li> </ul> $\text{Household waste capture rate (\%)} = \frac{\text{weight of managed waste (tpa)}}{\text{total household waste generated (tpa)}}$ <p>Total weight of managed waste is calculated as the product of:</p> $\text{weight of managed waste (tpa)} = \frac{\text{household collection coverage (\%)}}{\text{total household waste generated (tpa)}}$ <p>Collection service coverage (%) is the product of:</p> $\text{household collection coverage (\%)} = \frac{\text{number of households with some form of collection service}}{\text{total number of households}}$ <p>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:</p> $\text{total household waste generated (tpa)} = \text{average waste generation rate of location} \left( \frac{\text{kg}}{\text{capita}} \right) \times \text{location population}$ <ul style="list-style-type: none"> <li>• It is assumed that the remaining 14% of unmanaged waste includes waste that is burned, dumped, littered or buried, as well as waste that is delivered to the landfill directly.</li> </ul>
<b>Data gaps</b>	<ul style="list-style-type: none"> <li>• Methods for household waste disposal</li> <li>• Weight of waste captured by management services</li> </ul>
<b>Key considerations</b>	<ul style="list-style-type: none"> <li>• This KPI figure did not include the amount of waste delivered directly to the Nauru waste facility. It relies solely on the collection service coverage percentage, derived from household interview data.</li> <li>• It is assumed that the remaining 14% of unmanaged waste includes waste that is burned, dumped, littered, or buried, as well as waste that is delivered to the landfill directly.</li> </ul>



### Core KPI 7: Household collection service coverage

<b>Results</b>	<p><b>Household collection service coverage (%): 86.00%</b></p> <ul style="list-style-type: none"> <li>A free weekly waste collection service is offered to all households across Nauru.</li> <li>To access this service households are required to purchase a 240-litre wheelie bin from the NRC for AUD \$110.</li> <li>Households that do not use the service can drop their waste off directly at the Nauru waste facility.</li> </ul>
<b>Assumptions</b>	<ul style="list-style-type: none"> <li>Calculated based on information from 2019 mini-census data:             <ul style="list-style-type: none"> <li>Number of households</li> </ul> </li> </ul>
<b>Data gaps</b>	<ul style="list-style-type: none"> <li>An increase in the sample size of households interviewed may yield a more representative picture of the household collection service coverage in Nauru.</li> </ul>
<b>Key considerations</b>	<ul style="list-style-type: none"> <li>Based on household interviews and census data, household waste collection service coverage is 86.00%, which represents a high coverage proportion.</li> <li>Waste can be transported by residents directly to landfill, but this was not quantified during the audit.</li> </ul>



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

<b>Results</b>	<p><b>Fulfillment of MEA reporting requirements (%): 14.76%</b></p> <table border="1"> <thead> <tr> <th>Convention</th> <th>Status</th> <th>Reporting requirements</th> <th>Reports delivered</th> </tr> </thead> <tbody> <tr> <td><b>Basel Convention</b></td> <td>Accession</td> <td>Annual reports (21)</td> <td>2</td> </tr> <tr> <td><b>Stockholm Convention</b></td> <td>Accession</td> <td>5 reporting cycles (5)</td> <td>1</td> </tr> </tbody> </table>				Convention	Status	Reporting requirements	Reports delivered	<b>Basel Convention</b>	Accession	Annual reports (21)	2	<b>Stockholm Convention</b>	Accession	5 reporting cycles (5)	1
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<b>Basel Convention</b>	Accession	Annual reports (21)	2													
<b>Stockholm Convention</b>	Accession	5 reporting cycles (5)	1													
<b>Assumptions</b>	<ul style="list-style-type: none"> <li>None</li> </ul>															
<b>Data gaps</b>	<ul style="list-style-type: none"> <li>Only MEA's with mandatory reporting requirements were included in the calculation of this KPI.</li> <li>For MEA's such as the Waigani and Rotterdam Conventions, strict reporting requirements are not enforced and so are not included in the calculation.</li> </ul>															
<b>Key considerations</b>	<ul style="list-style-type: none"> <li>Nauru is behind on national reports for the Basel and Stockholm Conventions.</li> </ul>															



### Supplementary KPI 1: Cost of disposal to landfill

Supplementary KPI 1: Cost of disposal to landfill	
<b>Results</b>	<p><b>Cost of disposal to landfill (\$/tonne): AU \$47.65</b></p> <ul style="list-style-type: none"> <li>Costs for operation and contracts associated with the waste facility were not made available for the audit. The presented results are based on estimates from the audit team.</li> </ul>
<b>Assumptions</b>	<ul style="list-style-type: none"> <li>The NRC reported an average of AUD \$13.1 per cubic metre of waste sent to landfill, based on an estimate of 57,283 m<sup>3</sup> being disposed of at the facility in 2020. The report states that this would have cost AUD \$748,194, based on the facility's standard charges.</li> <li>Using the DCMR Framework calculation method, assuming an annual cost of \$748,194 (NRC) and input of 15,702 tonnes per annum to the facility yields a cost of disposal at AUD \$47.65.</li> </ul>
<b>Data gaps</b>	<ul style="list-style-type: none"> <li>Costs for operation and contracts associated with the Nauru waste facility</li> </ul>
<b>Key considerations</b>	<ul style="list-style-type: none"> <li>Completion of the waste facility register suggested by the DCMR Framework will provide sufficient data to accurately calculate this indicator to work as a benchmark for comparing disposal costs against previous periods, other countries, and the region.</li> </ul>



### Supplementary KPI 2: Total weight of waste disposed

Supplementary KPI 2: Total weight of waste disposed	
<b>Results</b>	<p><b>Total weight of waste disposed (tonnes per annum): 15,702</b></p>
<b>Assumptions</b>	<ul style="list-style-type: none"> <li>None</li> </ul>
<b>Data gaps</b>	<ul style="list-style-type: none"> <li>None</li> </ul>
<b>Key considerations</b>	<ul style="list-style-type: none"> <li>Future audits should follow the suggested methodology presented in the DCMR Framework. This KPI indicates the effectiveness of a country's waste management system in diverting waste from the environment via landfill and allows for comparison against past and future results across Nauru and the region.</li> </ul>



### Supplementary KPI 3: Total weight of waste recovered

<b>Results</b>	<b>Total weight of waste recovered (tonnes per annum): No data</b>
<b>Assumptions</b>	<ul style="list-style-type: none"> <li>• None</li> </ul>
<b>Data gaps</b>	<ul style="list-style-type: none"> <li>• No information was presented on the recorded weights of any waste recovered at any disposal site in Nauru in examined audit reports.</li> </ul>
<b>Key considerations</b>	<ul style="list-style-type: none"> <li>• The lack of dedicated recovery systems and facilities in Nauru is mentioned in the audit report.</li> <li>• Calculation of this performance indicator requires the completion of the waste facility register with the inclusion of data for any recovery facilities operating in the Cook Islands. This will provide an indication of the effectiveness of a country's waste management systems, recovery systems &amp; infrastructure, and a comparative data point for other countries and time periods.</li> </ul>



### Supplementary KPI 4: Volume and type of stockpiled hazardous waste

<b>Results</b>	<b>Volume and type of stockpiled hazardous wastes (m<sup>3</sup>):</b> <ul style="list-style-type: none"> <li>– Asbestos: 664 m<sup>3</sup></li> <li>– E-waste: No data</li> <li>– Healthcare and pharmaceutical waste: No data</li> <li>– Used oil: 62.6 m<sup>3</sup></li> <li>– Used tyres: No data</li> <li>– Obsolete chemicals: 0.25 m<sup>3</sup></li> </ul>
<b>Assumptions</b>	<ul style="list-style-type: none"> <li>• Asbestos was stored in 20 x full 20 ft shipping containers. It was assumed that these shipping containers had a volume of 33.2 m<sup>3</sup> each. 1 container was not full and was not included in the calculation.</li> </ul>
<b>Data gaps</b>	<ul style="list-style-type: none"> <li>• Stockpiles of e-waste and used tyres had weights recorded, but not volumes.</li> </ul>
<b>Key considerations</b>	<ul style="list-style-type: none"> <li>• According to the audit report, there are stockpiles in Nauru for most hazardous waste categories except healthcare and pharmaceutical waste. The 2020 audit report noted that the asbestos stockpile is substantial and may require management efforts to reduce or remove the hazard.</li> <li>• Future data should aim to record the estimated volume of each suggested category of hazardous waste separately to provide an indication of the size and presence of stockpiled hazardous waste in Nauru.</li> <li>• Landfill audits, stockpile assessments, and the completion of the waste facility register proposed by the DCMR Framework will provide the information required to calculate this performance indicator.</li> </ul>



### Supplementary KPI 5: Marine plastic pollution potential

Results	
<b>Results</b>	<b>Marine plastic pollution potential (tonnes per annum): 10.1</b>
<b>Assumptions</b>	<ul style="list-style-type: none"> <li>Assumes a national weight of mismanaged waste, based on household audit samples.               <ul style="list-style-type: none"> <li>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.</li> <li>Mismanaged waste is defined as all waste which is not captured in collection services, and ends up buried, burned, littered etc.</li> </ul> </li> <li>Uses a proportion of plastics captured in MSW composition.</li> </ul>
<b>Data gaps</b>	<ul style="list-style-type: none"> <li>Requires a more reliable metric for mismanaged waste.</li> </ul>
<b>Key considerations</b>	<ul style="list-style-type: none"> <li>Waste plastics which are not managed in an environmentally sound manner are assumed to pose a significant risk of polluting oceans and estuarine waterways.</li> <li>Waste plastics made up a high proportion of the MSW in Nauru, at about 12% percent or more of waste generated. Therefore, mismanaged waste plastics which are not captured and potentially polluting marine environments should be considered for proper management.</li> </ul>



### Supplementary KPI 6: Awareness of waste management services

Results	
<b>Results</b>	<b>Awareness of waste services (%): No data</b>
<b>Assumptions</b>	<ul style="list-style-type: none"> <li>None</li> </ul>
<b>Data gaps</b>	<ul style="list-style-type: none"> <li>Unable to calculate based on audit reports as this performance indicator requires completion of a community survey, specifically gathering responses on:               <ul style="list-style-type: none"> <li>Number of positive responses indicating awareness</li> <li>Number of available services</li> <li>Number of survey participants</li> </ul> </li> </ul>
<b>Key considerations</b>	<ul style="list-style-type: none"> <li>Completion of a community survey in the future is required to report to this KPI. Monitoring the community's awareness provides an indication of the success of education initiatives and the effective use of existing waste management services</li> </ul>





## Supplementary KPI 7: Proportion of strategic waste management initiatives implemented

<b>Results</b>	<p><b>Proportion of waste management initiatives implemented (%): 84.21%</b></p> <ul style="list-style-type: none"> <li>– Number of successfully implemented waste initiatives = 16 out of 19</li> <li>– Number of planned/pipeline initiatives = 3</li> <li>• Implemented initiatives include: <ul style="list-style-type: none"> <li>– National Solid Waste Management Strategy 2017-2026</li> <li>– National Implementation Plan for Persistent Organic Pollutants 2012</li> <li>– National Solid Waste Management Strategy 2017-2026</li> <li>– Environmental Management and Climate Change Act 2020</li> </ul> </li> <li>• Pipeline initiatives include: <ul style="list-style-type: none"> <li>– Development of environmental management legislation</li> <li>– Single Use Plastics Strategy</li> <li>– Work with UNEP Chemicals and Waste Programme to strengthen institutional capacity for chemicals and waste management</li> </ul> </li> </ul>
<b>Assumptions</b>	<ul style="list-style-type: none"> <li>• None</li> </ul>
<b>Data gaps</b>	<ul style="list-style-type: none"> <li>• None</li> </ul>
<b>Key considerations</b>	<ul style="list-style-type: none"> <li>• Until October 2020, Nauru lacked specific regulations for waste management and governance. Instead, solid waste management was primarily controlled by the <i>Litter Prohibition Act 1983</i>. Following the introduction of the <i>Environmental Management and Climate Change Act 2020</i>, Nauru now has dedicated legislation in place for waste management. <ul style="list-style-type: none"> <li>– Includes penalties for the burning of plastics or hazardous wastes.</li> </ul> </li> <li>• In planning at the time of the audit, a legislative review and planned policy development to strengthen Nauru’s capacity to commit to the obligations and goals of the Stockholm and Basel Conventions.</li> </ul>





### Supplementary KPI 8: Commercial waste capture rate

<b>Results</b>	<p><b>Commercial waste capture rate (%): Insufficient data</b></p> <ul style="list-style-type: none"> <li>• Measured as the fraction of the total waste captured through formal waste management services over the total waste generated by businesses.</li> <li>• Without estimates of commercial waste generation rates and the number of businesses, this indicator cannot be calculated.</li> </ul>
<b>Assumptions</b>	<ul style="list-style-type: none"> <li>• None</li> </ul>
<b>Data gaps</b>	<ul style="list-style-type: none"> <li>• No estimate for the number of businesses in Nauru provided.</li> <li>• No information available on the total amount of waste generated by businesses.</li> <li>• No information on waste generation rates for businesses in the audit report.</li> <li>• Accurate calculation of this performance indicator requires knowledge of commercial waste generation rates by business type. For example, hotel, retail, and office generation rates.</li> </ul>
<b>Key considerations</b>	<ul style="list-style-type: none"> <li>• 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.</li> <li>• 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.</li> </ul>



### Supplementary KPI 9: Commercial collection service coverage

<b>Results</b>	<p><b>Commercial collection service coverage (%): 29.00%</b></p> <ul style="list-style-type: none"> <li>• 17 businesses across Nauru were interviewed during the audit.</li> <li>• Interview responses noted that collection services were not available to all businesses in Nauru.</li> <li>• Businesses can opt in to receive paid waste collection or transport their waste to the landfill directly.</li> </ul>
<b>Assumptions</b>	<ul style="list-style-type: none"> <li>• Audit sample coverage is assumed to be representative of all of Nauru.</li> <li>• No information as to service coverages or the number of participating businesses beyond the conducted surveys was identified.</li> </ul>
<b>Data gaps</b>	<ul style="list-style-type: none"> <li>• The total number of businesses participating nationally is categorised by region/state/province and business type.</li> </ul>
<b>Key considerations</b>	<ul style="list-style-type: none"> <li>• Based on the interviews conducted, 29% of businesses in Nauru have access to some form of collection service.</li> <li>• Accurate calculation relies on understanding the total number of businesses participating nationally, and specific collection service coverages for businesses.</li> <li>• Completion of business surveys suggested in the DCMR Framework, would provide an indication of how regular, accessible, and affordable collection services are for businesses..</li> </ul>



## Supplementary KPI 10: Weight of disaster waste disposed

<b>Results</b>	<p><b>Weight of disaster waste disposed (tpa): No data</b></p> <ul style="list-style-type: none"><li>• Measured as a sum of the recorded weight of disaster waste disposed to a landfill or received and stockpiled at a waste facility following a disaster event.</li><li>• No disaster waste data was recorded during the examined audits.</li></ul>
<b>Assumptions</b>	<ul style="list-style-type: none"><li>• Only captures disaster waste which ends up disposed of or stored at waste facilities, including landfills, disposal sites and recovery facilities.</li><li>• 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).</li></ul>
<b>Data gaps</b>	<ul style="list-style-type: none"><li>• 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.</li></ul>
<b>Key considerations</b>	<ul style="list-style-type: none"><li>• 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.</li><li>• Calculating this KPI can be undertaken by regularly updating the waste facility register. Tracking the vehicle capacity and percentage fullness of the load of any 'disaster waste' carrying vehicles entering the facility will help reconcile waste amounts disposed if these wastes are not managed separately.</li></ul>





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