



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.**

Cook Islands National Waste Audit Analysis Report

August 2023



This Waste data collation, analysis and reporting for the Cook Islands 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).

Reproduction for educational or other non-commercial purposes is authorised without prior written permission from the copyright holder and provided that SPREP and the source document are properly acknowledged. Reproduction of this publication for resale or other commercial purposes is prohibited without prior written consent of the copyright owner.

SPREP Library Cataloguing-in-publication data

Cook Islands national waste audit analysis report
(August 2023). Apia, Samoa : SPREP, 2023.
28 p. 29 cm.

ISBN: 978-982-04-1242-2 (print)
978-982-04-1243-9 (ecopy)

1. Recycling (Waste, etc.) – Technical reports –
Cook Islands. 2. Waste management – Refuse and
refuse disposal – Cook Islands. 3. Hazardous wastes
– Auditing – Cook Islands. I. Pacific Regional
Environment Programme (SPREP). II. Title.
363.7280962 3

Disclaimer: This publication was produced with the financial support of the European Union. Its contents are the sole responsibility of SPREP and do not necessarily reflect the views of the European Union. This document has been compiled in good faith, exercising all due care and attention. SPREP does not accept responsibility for inaccurate or incomplete information.



Acknowledgment: The PacWastePlus programme acknowledges the MRA Consulting Group for their contributions towards the development of National Waste Audit analysis report.



PO Box 240

Apia, Samoa

T: +685 21929

E: sprep@sprep.org

W: www.sprep.org

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

PacWaste Plus Programme

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

About PacWaste Plus

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

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

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

Key Objectives

Outcomes & Key Result Areas

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

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

Key Result Areas

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

Learn more about the PacWaste Plus programme by visiting



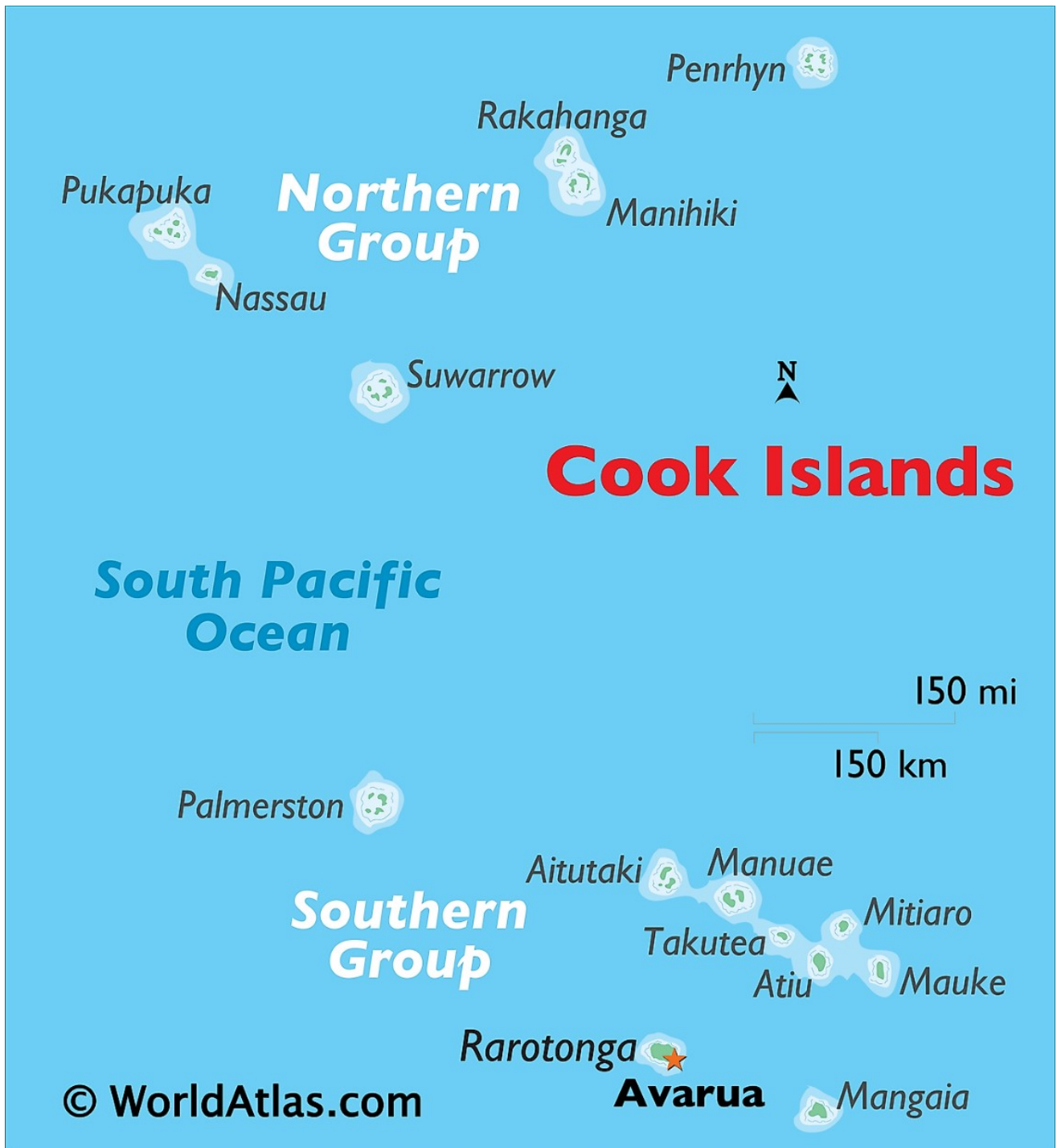
www.pacwasteplus.org

Table of Contents

Map of the Cook Islands.....	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.....	11
2.3 Key performance indicators.....	13
3 Audit analysis results.....	14
3.1 Summary of KPI reporting results and data availability.....	14
3.2 KPI reporting results.....	15



Map of the Cook Islands



Source: World Atlas, 2021.

Glossary

Acronym	Definition
C&D	Construction and Demolition (Waste)
C&I	Commercial and Industrial (Waste)
DCMR	Data Collection, Monitoring, and Reporting (Framework)
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
NSW EPA	Australian New South Wales Environment Protection Authority
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 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.
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. Incinerators are not included in this analysis.

Executive Summary

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

Table (a) Summary of Key Performance Indicators (KPIs) for the Cook Islands

Core KPIs	Result	Supplementary KPIs	Result
1. Count / capacity of modern waste facilities	3 / Capacity unknown	1. Cost of disposal to landfill (\$/annum)	NZ \$315.18 (US \$195.76)
2. Count / capacity of unregulated waste facilities	0 / 0	2. Weight of waste disposed (tpa)	397
3. National recovery rate (%)	No data	3. Weight of waste recovered (tpa)	No data
4. Per capita waste generation rate (kg/capita/year)	115	4. Volume and type of stockpiled hazardous waste (m ³)	See Section 3.2
5. Municipal Solid Waste (MSW) composition (%)	Figure (a)	5. Marine plastic pollution potential (tpa)	34.6
6. Household waste capture rate (%)	84.35%	6. Awareness and support of waste management services (%)	No data
7. Household collection service coverage (%)	84.35%	7. Proportion of strategic waste management initiatives implemented (%)	83.33%
8. Fulfillment of MEA reporting requirements (%)	15.56%	8. Commercial waste capture rate (%)	See Section 3.2
		9. Commercial collection service coverage (%)	75.72%
		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
-----------------	--------------	---------

Cook Islands MSW Composition

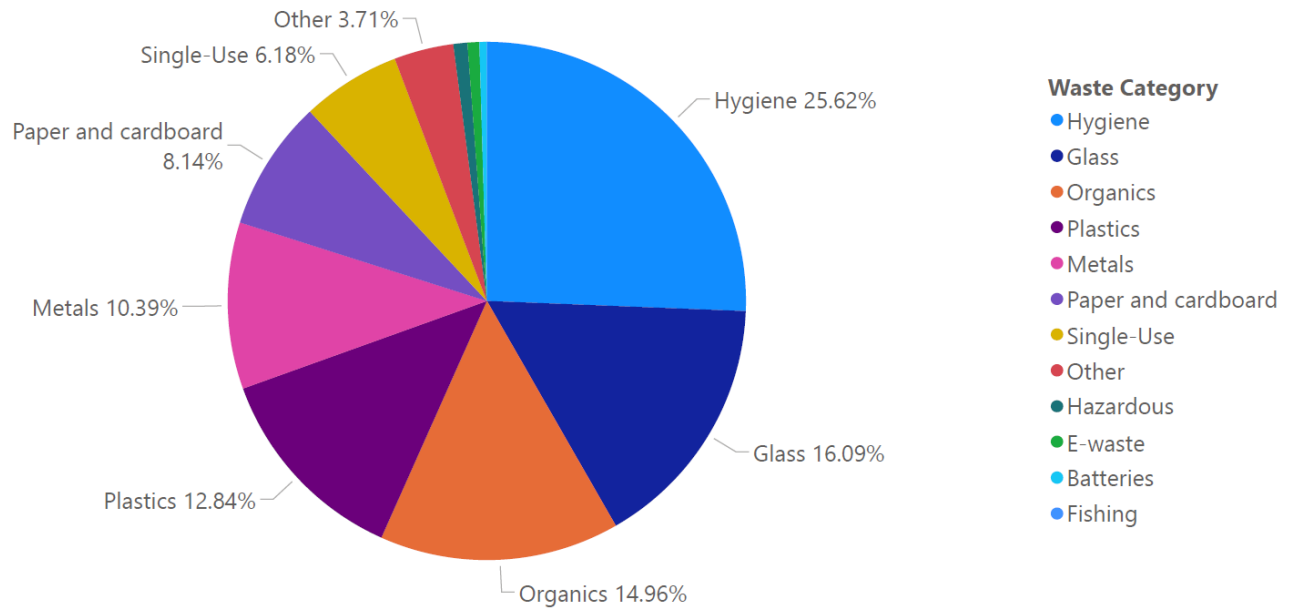


Figure (a) Cook Islands Municipal Solid Waste (MSW) Composition (% by weight)



1 Introduction

1.1 Background

The Cook Islands are 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 wastes to protect human health and the environment.

The Cook Islands' waste management practices are reliable and diversified. There are a range of collection services and disposal measures in place for different types of waste (e.g. commercial waste, household waste, hazardous waste). Moreover, the public's satisfaction of these services in the local area is high, and enterprises are willing to pay for them. Alternative methods of waste management to the provided collection services are still common (i.e. burning and burying).

1.2 Purpose and Aim

The purpose of this audit analysis and report is to establish a baseline position for Cook Islands 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 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 on the Cook Islands:

- **Cook Islands waste audit report 2021:** The audit was undertaken August to September 2020 and provided an evaluation of household and business waste generated in the Cook Islands. Audit data and information was obtained via interviews and waste collections from 146 households and 53 businesses, followed by sorting and weighing. The audit report also provided an assessment of the state of Cook Islands' landfills, including landfill audits and stockpile assessments.

The audit was undertaken soon after COVID-19 had been declared a global pandemic by the World Health Organisation. The audit report noted that business waste generation rates during the audit were significantly less than typically observed given tourism impacts on Cook Islands.

- 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 Cook Islands is a self-governing island country in the South Pacific Ocean in free association with New Zealand (a map is provided on Page 4 of this report). It comprises 15 islands with a total land area is 240 square kilometres. The population of the Cook Islands is about 15,040. Residents speak Cook Islands Māori and English. Over 74% of the population live on Rarotonga with about 10,898 people and it is the administrative centre for the region. Aitutaki is the second most populated island, with about 1,900 people.

There is no specific waste management legislation in place for the Cook Islands. Instead, waste management falls under the umbrella of general environmental and public health legislation. The Cook Islands government developed the *National Solid Waste Strategy 2013–2016* 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. The document identifies the lack of reliable data on waste generation and management as a major barrier to understanding the national waste situation.

Government departments with waste responsibilities in the Cook Islands include:

- National government:
 - National Environment Services: responsible for developing environmental policy, enforces regulation on illegal dumping, controls and monitors pollution, ensures environmentally safe disposal of chemicals;
 - Ministry of Infrastructure Cook Islands: oversees waste collection services and disposal sites;
 - Ministry of Health: Administers the Public Health Act of 2004;
 - Ministry of Agriculture: Administers the Pesticides Act of 1987.
- Island Environment Authorities: Each island has an established Island Environment Authority. These authorities are responsible for creating environmental protection and improvement guidelines for the purpose of the Cook Islands' Environment Act.



2 Methodology

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

2.1 Data Sources

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

Table 1 Data sources examined and available data

Data Source	Methods for data collation	Reported data
Cook Islands waste audit 2021	<ul style="list-style-type: none"> • Sample collection from households and businesses • Sort and weigh of household/business waste • Household and business interviews • Landfill audit • Stockpile assessment 	<ul style="list-style-type: none"> • Access to general waste collection service • Household and business waste composition • Recyclable collection and composition • Funding assessment • Stockpile types and quantities • Landfilled waste composition and weight • Customs data for imported and exported goods
2021 Cook Island National census	<ul style="list-style-type: none"> • National census 	<ul style="list-style-type: none"> • Population data • Household data (size, number)

2.1.1 Cook Islands Waste Audit Report 2021

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

Data was collected from households in urban and rural areas, as well as commercial premises, over the course of 14 days. A total of 146 household participated in sort & weigh sampling, and 169 participated in interviews. 120 household samples were taken from Rarotonga and 26 from Aitutaki. A total of 53 business participated in sort & weigh sampling, and 62 participated in interviews. 49 commercial samples were taken from Rarotonga and 4 in Aitutaki.

In addition, around 95 landfill audits and 100 stockpile assessments were conducted. The waste composition, recycling potential, hazardous waste status and future treatment options were audited for Rarotonga and Aitutaki landfills over a two-week period.

Table 2 Sample locations for audits

Sample Location	Population (2021)	Classification
Rarotonga	10,898	Urban
Aitutaki	3,040	Rural

2.2 Data Analysis

Each country's audit reports, audit data, and other relevant data sources were inspected for relevant information which was subsequently collated into country specific databases. The extracted audit data was 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

- Audit data presented the composition proportions of waste sampled at Aitutaki and Rarotonga landfills, with volumetric estimates for each category, based on visual assessment only. To calculate the weights of landfilled waste on the Cook Islands, density conversion factors were used based on Australia's New South Wales Environment Protection Authority's (NSW EPA) "Disposal-based audit Commercial and industrial waste stream in the regulated areas of New South Wales, Appendix D- Material Density Conversion Factors".

The PRIF audited waste categories were matched to equivalent waste categories presented in the NSW EPA's density conversion factors list.

- The audit data provided for 'urban' areas (Rarotonga) and 'rural' areas (Aitutaki) (see **Table 2**) is assumed to be representative of the rest of the country.
- All population estimates used to calculate performance indicators are based on national census data from 2021.
- 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 with the aim of improving the efficiency of data collection activities by building on pre-existing data collection practices across the region.

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

- a waste facility register;
- household waste audits and community surveys;
- business waste audits and surveys;
- a policy survey; 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 KPI reporting results and data availability

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

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

Core KPIs		Supplementary KPIs	
1. Count / capacity of modern waste facilities		1. Cost of disposal to landfill (\$/annum)	
2. Count / capacity of unregulated waste facilities		2. Weight of waste disposed (tpa)	
3. National recovery rate (%)		3. Weight of waste recovered (tpa)	
4. Per capita waste generation rate (kg/capita/year)		4. Volume and type of stockpiled hazardous waste (m ³)	
5. Municipal Solid Waste (MSW) composition (%)		5. Marine plastic pollution potential (tpa)	
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 (tpa)	

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 KPI’s 1, 2, 5, 7 and 9.
- Limited data was provided within the audit report to calculate Core KPIs 1 and 2, and Supplementary KPIs 4, and 8.
 - No information on the maximum processing capacities of the waste facilities was provided.
 - Limited information provided on environmental controls in place for the Arorangi recycling facility.
 - Stockpile volume estimates were not given for all suggested hazardous waste categories.
 - There was limited information to accurately estimate of the cost of disposal to landfill.
 - All performance indicators requiring estimates for the weight of landfilled waste were calculated using density conversion factors published by the NSW EPA.
 - There was some information on commercial waste capture 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.
- No data was available in the report to calculate Core KPI 3, and Supplementary KPIs 3, 6, and 10.

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 the Cook Islands.

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 the Cook Islands to compare future data to, and to guide subsequent waste management or waste data related activities.



Core KPI 1: Count / capacity of modern waste facilities

Result	<p>Count of modern waste facilities: 3</p> <ul style="list-style-type: none"> Both Aitutaki landfill and Rarotonga landfill, the country's only two landfills, are licensed, staffed, have access to equipment, manage leachate, and use daily some form of daily cover system. The audit report also mentions there being a recycling centre in Arorangi, located within the Rarotonga Waste Facility. The centre is equipped with a sorting area for plastic and glass bottles at the rear, along with an industrial baler for compacting plastic, aluminium, and tin cans and a glass crusher. It is assumed that the facility is staffed. The waste facility site includes primary and secondary treatment ponds for wastewater. It is worth noting that at the time of the audit, damage from tropical storms had significantly impacted the leachate lining at the Aitutaki landfill. <p>Capacity of modern waste facilities (tonnes per annum): No data</p>
Assumptions	<ul style="list-style-type: none"> None
Data gaps	<ul style="list-style-type: none"> No data to indicate the maximum capacities (tpa) for Aitutaki and Rarotonga landfills. No information available on the recycling centre's environmental controls such as fire prevention. No storage or processing capacities (tpa) for any facility in the Cook Islands were able to be calculated.
Key considerations	<ul style="list-style-type: none"> All major waste facilities on the Cook Islands are classified as 'modern' facilities. Additional information is required on the Arorangi recycling facility to confirm the specific environmental controls in place, despite its location at the Rarotonga Waste Facility. It is recommended that maximum capacities for both facilities are investigated and reported on. It is recommended that the number, location, name, operations of all landfills, dumpsites and recovery facilities are collated for future reporting to this performance indicator.



Core KPI 2: Count / capacity of unregulated waste facilities

Result	<p>Count of unregulated waste facilities: 0</p> <ul style="list-style-type: none"> Aitutaki and Rarotonga landfills are both classified as ‘modern’ facilities by the definitions outlined in the DCMR Framework. Arorangi recycling facility is assumed to be a ‘modern’ facility as it is located within the Rarotonga waste facility site. <p>Capacity of unregulated waste facilities (tonnes per annum): No data</p>
Assumptions	<ul style="list-style-type: none"> None
Data gaps	<ul style="list-style-type: none"> None
Key considerations	<ul style="list-style-type: none"> Additional information is required to confirm the recycling centre can be classified as a ‘modern’ facility despite the range of processing technology available at the site. It is recommended that the number, location, name, and operations of all landfills/dumpsites and recovery facilities are collated for future reporting to this performance indicator.



Core KPI 3: National recovery rate

Results	<p>National recovery rate (%): No data</p> <ul style="list-style-type: none"> The Cook Islands operates a recycling centre in Arorangi at the Rarotonga Waste Facility. The centre is equipped with a sorting area for plastic and glass bottles at the rear, along with an industrial baler for compacting plastic, aluminium, and tin cans, and a glass crusher is housed within the recycling centre building. Residents separate glass, cans (aluminium and steel), plastic bottles (PET and HDPE), and glass bottles for recyclables. Recyclables are collected alongside rubbish and are manually loaded into a dedicated collection vehicle and trailer. This collection is undertaken by a private contractor commissioned by the Ministry of Infrastructure Cook Islands. Small businesses can also use the recyclables service. Collections are undertaken at the same time as household collections. Recyclables collected from households and businesses are taken to the Rarotonga Waste Facility or Aitutaki Waste Facility. Recyclables at the Rarotonga facility are stored separately in designated bays, including glass bottles, cans, paper, and cardboard (the latter is bailed). The site is nearing capacity. The Aitutaki facility has a plastic bottle baler and a baler for aluminium cans. No information regarding the amount of waste and recycling received and processed at the facility is given. The only waste recovery facility identified in the report is the Arorangi recycling centre.
Assumptions	<ul style="list-style-type: none"> None
Data gaps	<ul style="list-style-type: none"> Amount of waste received at recovery facilities (tonnes per annum).
Key considerations	<ul style="list-style-type: none"> The audit highlighted a good level of capture of glass for recycling on both Rarotonga and Aitutaki from households and businesses. The audit report identified that no export of recyclables is currently undertaken. High export costs for consolidated recycled material is a barrier to expanding current recycling operations. It is recommended that further investigation of barriers to recovery is undertaken.



Core KPI 4: Per capita waste generation rate

Results	Per capita waste generation rate (kg/capita/year): 115 <ul style="list-style-type: none">– kg/capita/day: 0.314– kg/household/day: 1.00
Assumptions	<ul style="list-style-type: none">• Household waste audit data was converted from a per household basis to a per capita basis, then grouped and averaged based on geographic position (i.e. rural or urban), and extrapolated using census data of the national population.• Aitutaki (part of the Southern Islands) was classified as 'rural', and used to extrapolate data across the rest of the Southern Islands (also classified as 'rural') for which there was a lack of data.• Where there was no data available for the Northern Islands (i.e. Mangaia, and other islands), an assumed 'rural' average waste generation rate was used based on data from household audits from Aitutaki.• Population statistics used are from 2021 census results.
Data gaps	<ul style="list-style-type: none">• No information recorded for most of outer islands.• Not all regions, islands or towns / villages represented in audits have corresponding data represented in the 2021 census.• No information available on waste generation rates in semi-urban areas.
Key considerations	<ul style="list-style-type: none">• Future per capita waste generation rates will provide insights into waste management trends and changes for the Cook Islands.





Core KPI 5: Municipal Solid Waste (MSW) Composition

Results

Hygiene waste is the most prevalent waste type found in household waste compositions on the Cook Islands. This is followed by glass and then organics.

- Hygiene waste: 25.62%
- Glass: 16.09%
- Organic: 14.96%

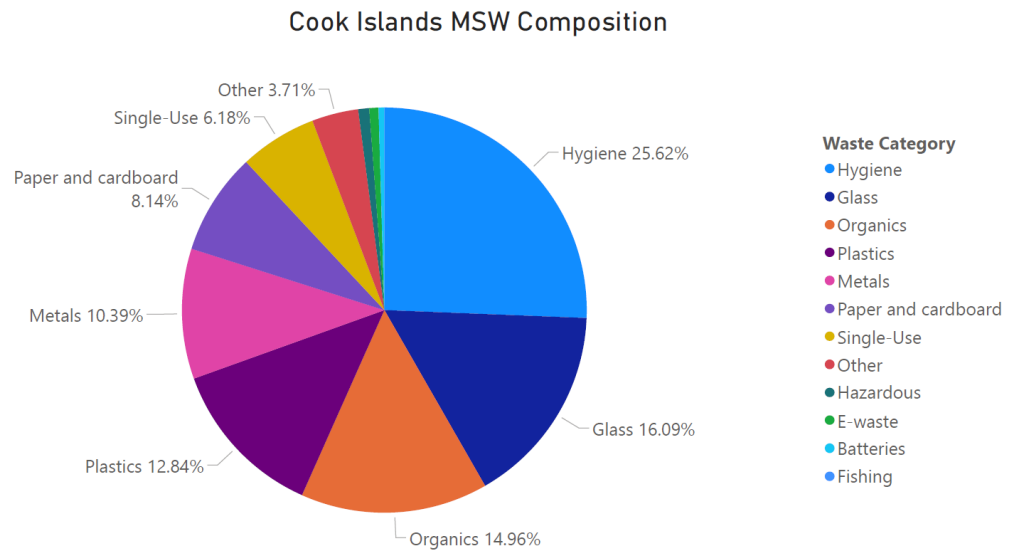


Figure 1 Cook Islands Municipal Solid Waste (MSW) Composition (% by weight)

Assumptions

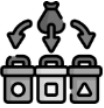
- None

Data gaps

- No samples taken in the Northern Islands.
- Waste data for Aitutaki was used to represent the outer islands.

Key considerations

- Data for the outer islands was not captured. The composition of waste in these rural areas may differ considerably from what was found in Rarotonga and Aitutaki.
- 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	<p>Household waste capture rate (%): 84.35%</p> <ul style="list-style-type: none"> – Total weight of household waste generated = 1,723 – Total weight of household waste captured responsibly = 1,454
Assumptions	<ul style="list-style-type: none"> • The survey and audits did not capture each household’s disposal method, nor the weight of waste captured by management services, so census data was used and extrapolated across household audit results. <p style="text-align: center;"><i>Household waste capture rate (%) = $\frac{\text{weight of managed waste (tpa)}}{\text{total household waste generated (tpa)}}$</i></p> <p>Total weight of managed waste is calculated as the product of:</p> <p style="text-align: center;"><i>weight of managed waste (tpa) = $\frac{\text{household collection coverage (%)}}{\text{total household waste generated (tpa)}}$</i></p> <p>Collection service coverage (%) is the product of:</p> <p style="text-align: center;"><i>household collection coverage (%) = $\frac{\text{number of households with some form of collection service}}{\text{total number of households}}$</i></p> <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> <p style="text-align: center;"><i>total household waste generated (tpa)</i></p> <p style="text-align: center;"><i>= average waste generation rate of location $\left(\frac{\text{kg}}{\text{capita}} \right)$</i></p> <p style="text-align: center;"><i>× location population</i></p>
Data gaps	<ul style="list-style-type: none"> • None
Key considerations	<ul style="list-style-type: none"> • The majority of household waste generated in the Cook Islands is captured by waste management services. • The remaining proportion of waste generated which is not captured via waste management services is at risk of being burned, littered, buried, or dumped, and uncaptured waste poses a risk to both environmental and community health.



Core KPI 7: Household collection service coverage

Results	<p>Household collection service coverage (%): 84.35%</p> <ul style="list-style-type: none">• The audit reported that 94% of surveyed households in Rarotonga had access to some form of waste collection service, and 93% in Aitutaki.• Census data from 2021 reported:<ul style="list-style-type: none">– 92% of the Rarotongan population had access to some form of waste collection service.– 69% of the population on the Southern Islands had access to some form of waste collection service.– 36% of the population on the Northern Islands had access to some form of waste collection service.
Assumptions	<ul style="list-style-type: none">• The performance indicator was calculated based on information from 2021 census data and the number of households.• To calculate this performance indicator, it was necessary to make assumptions on the proportion of the population (by Island group and for Rarotonga) which had access to:<ul style="list-style-type: none">– Public waste collection– Drop-off points– Composting services
Data gaps	<ul style="list-style-type: none">• None
Key considerations	<ul style="list-style-type: none">• The audit report provided adequate data for use in Rarotonga, and data from Aitutaki which could be extrapolated to the rest of the country. However, the 2021 Cook Islands national census provided additional comprehensive information that allowed a weighted average for Rarotonga, the Northern Island group and Southern Island group to be calculated.



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

Fulfillment of MEA reporting requirements (%): 15.56%			
Convention	Status	Reporting requirements	Reports delivered
Basel Convention	Accession	Annual reports (18)	2
Stockholm Convention	Accession	5 reporting cycles (5)	1
<ul style="list-style-type: none"> None 			
<ul style="list-style-type: none"> Only MEA's with mandatory reporting requirements were included in the calculation of this KPI. For conventions like the Waigani Convention of which the Cook Islands is a member, strict reporting requirements are not enforced and so are not included in the calculation. 			
<ul style="list-style-type: none"> The Cook Islands 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): NZ \$315.18
Assumptions	<ul style="list-style-type: none"> None 	
Data gaps	<ul style="list-style-type: none"> It was estimated that the cost of operating Rarotonga landfill was around NZ\$ 100,000 to \$150,000 per annum. <ul style="list-style-type: none"> This calculation assumed a median cost of NZ \$125,000 per annum. The annual tonnes of waste disposed was calculated as 397 tpa. (See Supplementary KPI 2) No operational costs were provided for Aitutaki landfill or the Arorangi recycling centre. 	
Key considerations	<ul style="list-style-type: none"> 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. 	



Supplementary KPI 2: Total weight of waste disposed

Supplementary KPI 2: Total weight of waste disposed	
Results	Total weight of waste disposed (tonnes per annum): 397
Assumptions	<ul style="list-style-type: none"> Volumetric data from the audit was converted to weight using density conversion factors published by the NSW EPA.
Data gaps	<ul style="list-style-type: none"> No weights of wastes sampled at landfill were recorded by the audit.
Key considerations	<ul style="list-style-type: none"> Future audits should follow the suggested methodology presented in the DCMR Framework. Where possible, data regarding weights of landfilled waste should be accessible for use in the calculation.



Supplementary KPI 3: Total weight of waste recovered

Supplementary KPI 3: Total weight of waste recovered	
Results	Total weight of waste recovered (tonnes per annum): No data
Assumptions	<ul style="list-style-type: none"> None
Data gaps	<ul style="list-style-type: none"> No weight data for landfilled waste or recovered waste was recorded during the audit.
Key considerations	<ul style="list-style-type: none"> While recycling infrastructure does exist on the Cook Islands, the amount of waste which this infrastructure collects, stores and recovers from the country's total waste generated is not able to be calculated with currently available data. 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 & infrastructure, and a comparative data point for other countries and time periods.



Supplementary KPI 4: Volumes of stockpiled hazardous waste

Supplementary KPI 4: Volumes of stockpiled hazardous waste	
Results	Volumes of stockpiled hazardous wastes (m³): <ul style="list-style-type: none">– Asbestos: No data– E-waste: 100 m³– Healthcare and pharmaceutical waste: No data– Used oil: No data– Used tyres: No data– Obsolete chemicals: No data <ul style="list-style-type: none">• The audit recorded 17m³ of stockpiled “hazardous” waste in the country.
Assumptions	<ul style="list-style-type: none">• None
Data gaps	<ul style="list-style-type: none">• Volumetric data was not always recorded. At times counts or weights of stockpiles were recorded.• The audit utilises stockpile categories based on PRIF guidelines, which include a ‘hazardous’ category, composing of: paint, fluorescent tubes, household chemicals, asbestos, clinical (medical), gas bottles, mercury, containerised used oil, hazardous (other).<ul style="list-style-type: none">– Individual estimates for chemicals, asbestos, and clinical waste, and used oil were not provided.
Key considerations	<ul style="list-style-type: none">• Some e-waste stockpiles have been reported on. However, the volume of other hazardous waste stockpiles in the Cook Islands remains unknown.• 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 the Cook Islands.• 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.



Supplementary KPI 5: Marine plastic pollution potential

Results	
Results	Marine plastic pollution potential (tonnes per annum): 34.6
Assumptions	<ul style="list-style-type: none"> Assumes a national weight of mismanaged waste, based on household audit samples. <ul style="list-style-type: none"> 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 proportion of plastics captured in MSW composition.
Data gaps	<ul style="list-style-type: none"> Requires a more reliable metric for mismanaged waste.
Key considerations	<ul style="list-style-type: none"> Waste plastics which are not managed in an environmentally sound manner are assumed to pose a significant risk of polluting oceans and estuarine waterways. Waste plastics made up a high proportion of the MSW in the Cook Islands, at about 12% percent of waste generated. Therefore, mismanaged waste plastics which are not captured and potentially polluting marine environments should be considered for proper management.



Supplementary KPI 6: Awareness of waste management services

Results	
Results	Awareness of waste services (%): No data
Assumptions	<ul style="list-style-type: none"> None
Data gaps	<ul style="list-style-type: none"> Unable to calculate based on audit reports as this performance indicator requires completion of community survey, specifically gathering responses on: <ul style="list-style-type: none"> Number of positive responses indicating awareness Number of available services
Key considerations	<ul style="list-style-type: none"> Completion of 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 effective use of existing waste management services.



Supplementary KPI 7: Proportion of strategic waste management initiatives implemented

Results	<p>Proportion of waste management initiatives implemented (%): 83.33%</p> <ul style="list-style-type: none">– Number of successfully implemented initiatives = 10 out of 12– Number of pipeline initiatives = 2• Implemented initiatives include:<ul style="list-style-type: none">– Environment Act 2003 including the plastic bag import ban– Single Use Plastic Ban Policy 2018-2023– Solid Waste Management Policy 2016-2026– National Solid Waste Management Strategy 2013-2026• Pipeline initiatives include:<ul style="list-style-type: none">– Introduction of the Solid and Hazardous Waste Bill– Introduction of a ban on Single Use Plastics
Assumptions	<ul style="list-style-type: none">• None
Data gaps	<ul style="list-style-type: none">• None
Key considerations	<ul style="list-style-type: none">• The Cook Islands have several implemented and upcoming waste management initiatives which reflect the country's efforts towards proper waste management. However, at the time of the audit, no specific waste management legislation was in place. Waste management falls under general environmental and public health legislation.• The Cook Islands' <i>National Solid Waste Strategy 2013 - 2016</i> offers insight and perspective on waste management, highlighting the absence of information on waste management and production as a barrier to understanding it's waste situation.





Supplementary KPI 8: Commercial waste capture rate

Results	Commercial waste capture rate (%): Insufficient data <ul style="list-style-type: none">• Measured as the fraction of the total waste captured through formal waste management services over the total waste generated by businesses.• Without estimates of commercial waste generation rates and the number of businesses, this indicator cannot be calculated.
Assumptions	<ul style="list-style-type: none">• None
Data gaps	<ul style="list-style-type: none">• No estimate for the number of businesses in the Cook Islands in the audit report.• No information available on the total amount of waste generated by businesses.• No information on waste generation rates by business type in the audit report.
Key considerations	<ul style="list-style-type: none">• Accurate calculation relies on an estimate of total numbers of businesses in the country categorised by business type, and an estimate of the commercial waste generation rates for each business type.• Completion of business surveys suggested in the DCMR Framework will provide an indication of how many businesses are using collection services, and other forms of waste management, and to what extent these businesses access the service.





Supplementary KPI 9: Commercial collection service coverage

Results	<p>Commercial collection service coverage (%): 75.72%</p> <ul style="list-style-type: none"> 52 businesses in Rarotonga and 8 businesses in Aitutaki were interviewed during the audit. <ul style="list-style-type: none"> Rarotonga coverage: 92.31% Aitutaki coverage: 38.50%
Assumptions	<ul style="list-style-type: none"> Results for businesses sampled assumed to be representative of the remaining Cook Island businesses.
Data gaps	<ul style="list-style-type: none"> No information on service coverages or number of participating businesses beyond the conducted surveys were identified. The audit report did not quantify access to other disposal methods used by businesses (e.g. waste disposal-points or self-haul), however the different disposal methods indicated by respondents was listed.
Key considerations	<ul style="list-style-type: none"> Based on interviews conducted in Rarotonga and Aitutaki, around 75% of businesses in the Cook Islands have access to some form of waste collection service. Accurate calculation relies on understanding the total number of businesses participating nationally, and specific collection service coverages for businesses. Completion of business surveys suggested in the DCMR Framework, would provide an indication of how regular, accessible, and affordable collection services are for businesses.



Supplementary KPI 10: Weight of disaster waste disposed

Results	<p>Weight of disaster waste disposed (tpa): No data</p> <ul style="list-style-type: none"> Measured as a sum of the recorded weight of disaster waste disposed to landfill or received and stockpiled at waste facility following a disaster event. No disaster waste data was recorded during the examined audits.
Assumptions	<ul style="list-style-type: none"> Only captures disaster waste which ends up disposed of or stored at waste facilities, including landfills, disposal sites and recovery facilities. Assumes that the waste facility register has been completed to capture disaster waste information separately of other waste loads received post-event (i.e. information on disaster waste categorised separately to other waste types/streams).
Data gaps	<ul style="list-style-type: none"> The calculation of this performance indicator relies on estimations of the weight of disaster waste (tonnes) landfilled or received at a waste disposal facility following disaster events.
Key considerations	<ul style="list-style-type: none"> Calculation of this performance indicator provides an estimate of the amount of disaster waste being effectively managed and the total amount of disaster waste generated in a year. Calculating this KPI can be undertaken by regularly updating the waste facility register. Tracking the vehicle capacity and percentage fullness of the load of any 'disaster waste' carrying vehicles entering the facility will help reconcile waste amounts disposed if these wastes are not managed separately.



EUROPEAN UNION



SPREP
Secretariat of the Pacific Regional
Environment Programme



ISBN 978-982-04-1242-2



9 789820 412422