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

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

Samoa National Waste Audit Analysis Report

June 2025

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

© Secretariat of the Pacific Regional Environment Programme (SPREP) 2025

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

Samoa national waste audit analysis report,
(June 2025). Apia, Samoa : SPREP, 2025.

47 p. ; 29 cm.

ISBN: 978-982-04-1447-1 (ecopy)

1. Recycling (Waste, etc.) – Technical reports – Samoa.
2. Waste management – Refuse and refuse
Disposal – Samoa. 3. Waste products – Analysis
– Samoa. I. Pacific Regional Environment
Programme (SPREP). II. Title.

363.728709614

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 PacWaste Plus programme acknowledges the Eunomia Research and Consulting Ltd 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

EUROPEAN UNION

SPREP Secretariat of the Pacific Regional Environment Programme

PacWastePlus PACIFIC WASTE MANAGEMENT

www.pacwasteplus.org

Table of Contents

Map of Samoa

Source: World Atlas, 2020

Glossary

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

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

Executive Summary

Waste data collation, analysis and reporting for the Samoa 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 Samoa

Core KPIs	Result	Supplementary KPIs	**Result**
1. Count / capacity of modern waste facilities	0 / 0	1. Cost of disposal to landfill ($/tonne)	US $28.53
2. Count / capacity of unregulated waste facilities	6 / Capacity unknown	2. Weight of waste disposed (tpa)	18,967
3. National recovery rate (%)	7.39	3. Weight of waste recovered (tpa)	1,514
4. Per capita waste generation rate (kg/capita/year)	96.12	4. Volume and type of stockpiled hazardous waste (m^3)	Asbestos0 E-waste 3 Healthcare and pharmaceutical 0 Used oil 350 Used tyres:139 Obsolete chemicals 0 Others 0
5. Municipal Solid Waste (MSW) composition (%)	Figure (a)	5. Marine plastic pollution potential (tpa)	22.2
6. Household waste capture rate (%)	94%	6. Awareness and support of waste management services (%)	93%
7. Household collection service coverage (%)	93%	7. Proportion of strategic waste management initiatives implemented (%)	84%
8. Fulfillment of MEA reporting requirements (%)	52%	8. Commercial waste capture rate (%)	100%
		9. Commercial collection service coverage (%)	100%
		10. Total weight of disaster waste disposed (tpa)	No data

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

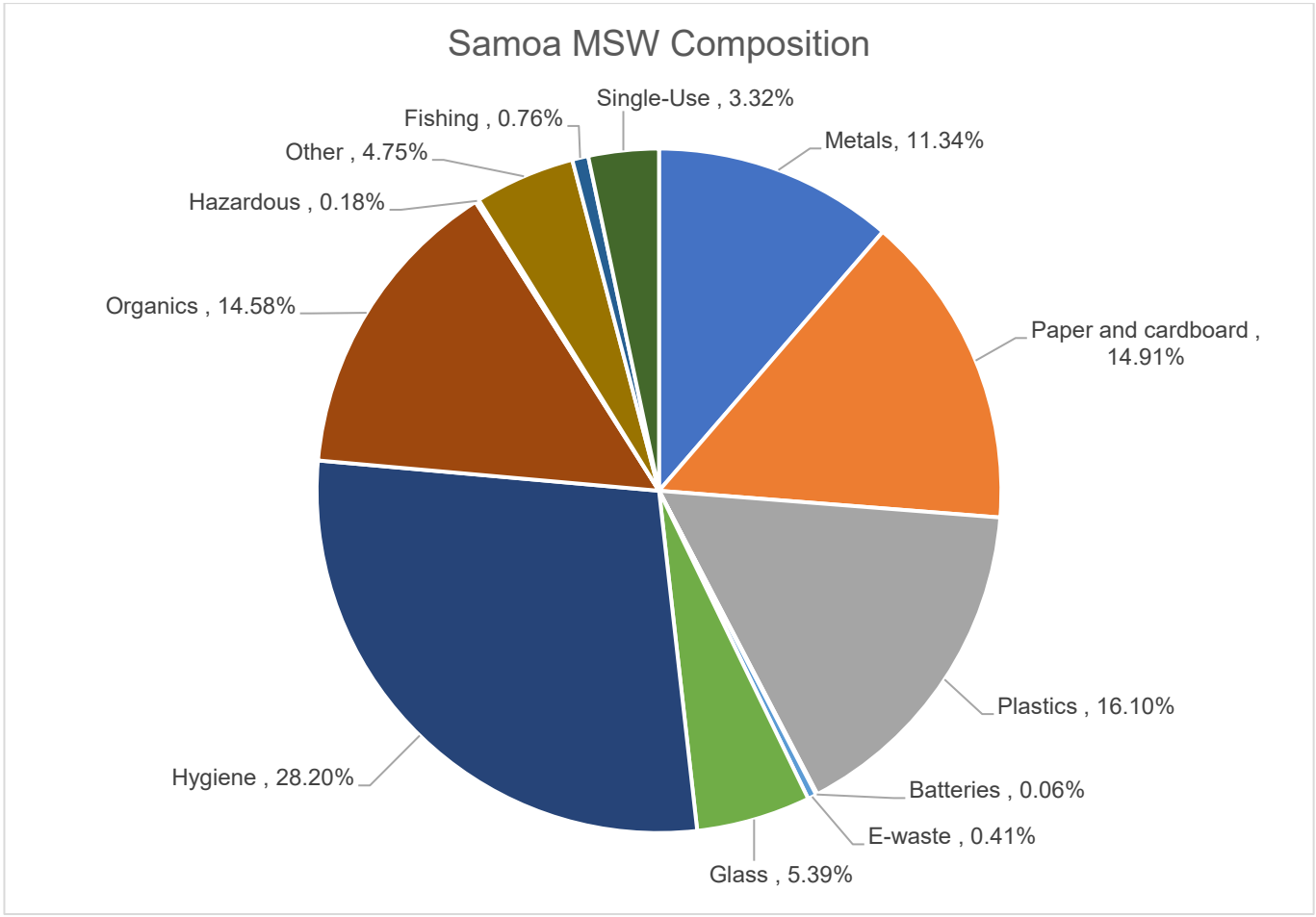


Figure (a) Samoa Municipal Solid Waste (MSW) Composition (% by weight)

1 Introduction

1.1 Background

Samoa 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 wastes to protect human health and the environment.

Samoa's waste management practices are mostly limited to landfilling. Recycling efforts are primarily carried out by private operators, with some support from the government. A large proportion of organic waste is sustainably self-managed in rural communities. The remaining waste is commonly burnt, buried, or dumped.

The Samoa Recyclers and Waste Management Association was established to coordinate among recyclers and strengthen engagement with government agencies and international donors. The Waste Management Act 2010 provides a comprehensive legal framework for waste management and recycling activities, although progress in implementing the required mechanisms has been limited. The country requires investment in infrastructure, implementation of data-guided decision making, and increased general waste management education to improve the current situation.

1.2 Purpose and Aim

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

The aim of this report is to:

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

1.3 Scope

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

- **Samoa waste audit report 2021**: The audit was undertaken by Asia Pacific Waste Consultants in March 2020 (just prior to closure of borders due to COVID-19) and in May 2020 (after the reopening of the borders) and provided an evaluation of household and business waste generated in Samoa. Audit data and information was obtained via interviews and waste collections from 201 households of which 120 participated in interviews, and 47 businesses of which 39 participated in interviews, followed by sorting and weighing. The audit report also provided an assessment of the state of Samoa's landfills including landfill audits and stockpile assessments.
- 2021 IUCN Plastic Waste-Free Islands (PWFI) Project through World Bank
- 2023 National Waste Audit Analysis Report
- 2025 Additional Data collection & Consulting Waste Facility Register
- Information received from relevant stakeholders

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

Samoa, officially known as the Independent State of Samoa, is located in the South Pacific Ocean, about halfway between New Zealand and Hawaii. The capital city of Samoa is Apia, located on the island of Upolu. Samoa has a population of approximately 200,000 and a total land area of 2,831 square kilometres, most of the population lives on the island of Upolu and 80 percent of this population lives in rural communities. The four populated Islands of Samoa are Upolu, Savai'i, Apolima and Manono.

Samoa has an active waste management strategy and multiple stakeholders are responsible for its delivery. The *Waste Management Act 2010* provides a comprehensive legal framework for waste management and recycling activities in the country.

The *Samoa National Waste Management Strategy 2019-2023* is an updated version of the previous strategy developed by the Ministry of Natural Resources and Environment (MNRE). The strategy aims to improve waste management practices in Samoa.

The responsibility for managing solid waste is divided among various institutions in Samoa include:

- National government: The national government is responsible for creating national legislation, strategies, and policy frameworks for waste management, as well as fulfilling obligations under international conventions, primarily through the MNRE.
- Local government: Responsible for village-level affairs, including public health and village hygiene, and enforcing waste management laws at the community level.

Other committees and associations as well as private sectors also play a role in Samoa's waste management. Overall, the implementation of the strategy will require collaboration and engagement from all stakeholders, including government agencies, businesses, communities, and individuals.

2 Methodology

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

2.1 Data Sources

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

Table 1 Data sources examined and available data

Data Source	Year	Location/s	Sample Size/s	Method for Data Collection	Reported Data
Samoa Waste Characterisation and Situational Analysis World Bank & Plastic Waste-Free Islands - IUCN	2021	Savaii, Apia, Lefaga, Upolu	207	Household audit	Per capita generation, waste composition, total household waste generated
Samoa Waste Characterisation and Situational Analysis World Bank & Plastic Waste-Free Islands - IUCN	2021	Savaii, Apia, Lefaga, Upolu	155	Household survey	Waste collection coverage, Awareness of waste services
Samoa Waste Characterisation and Situational Analysis World Bank & Plastic Waste-Free Islands - IUCN	2021		37	Commercial audit	Per employee waste generation
Samoa Waste Characterisation and Situational Analysis World Bank & Plastic Waste-Free Islands - IUCN	2021		41	Commercial survey	Waste collection coverage
Niue National Waste Audit Analysis Report MRA Consulting Group	2023				
Waste Facility Register Eunomia Research & Consulting	2025	Samoa	6	Waste facility register surveys	Number and capacity of facilities, waste disposed, waste recovered, cost of landfill operation, hazardous waste stockpiled, disaster waste

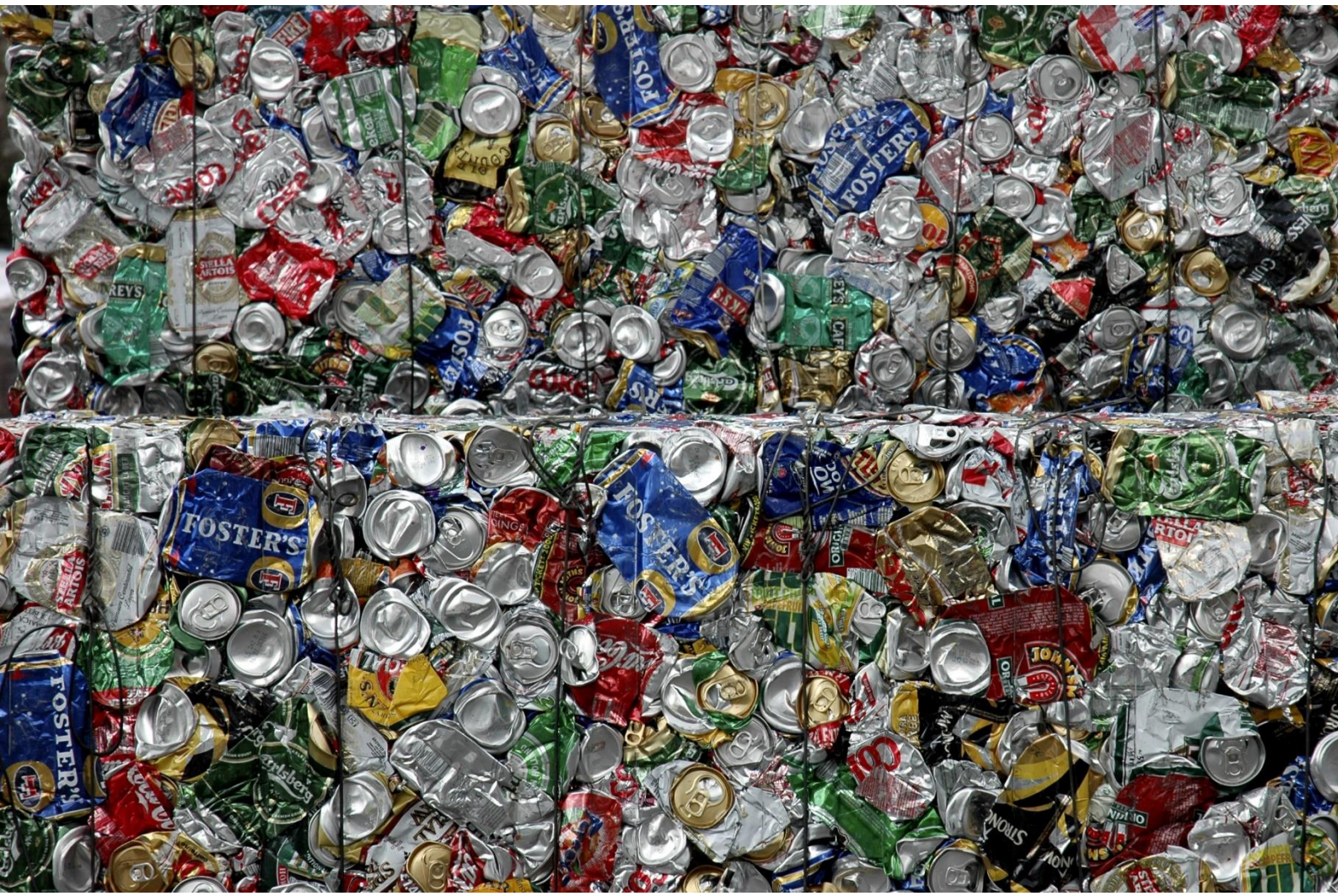
2.2 Data Analysis

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

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

2.2.1 Main Assumptions

- The audit data provided for 'urban' areas (Apia) and 'rural' areas (rural Upolu and Savai'i) (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.



2.2.2 Main Challenges

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

1. Oftentimes, facilities do not carry licenses and as such, capacity to accept waste is not always known. In most cases, operation exceeds capacity due to lack of foresight on the remaining capacity. In addition, planning for new waste facilities can be daunting due to limited options to locate a site. The reasons could be land tenure, site suitability especially for atoll islands, and community approval for potential sites within human settlements.

2. Most of the waste facilities did not undergo Environmental Impact Assessment and as such are operating without necessary environmental controls. This could have been addressed in the licensing process but is not happening due to limited options available to site the facilities.

3. Data collection relies on guess estimates due to lack of proper recording system of waste material flow and receipt of these materials in the facilities. The measurement of capture rate could be very challenging with the lack of data on wastes received in the facilities.

4. It is hard to determine recovery of materials to calculate national recovery rate since most of the materials remain stockpiled and not processed or exported and as such cannot be considered a return to economy.

5. Request for information from the countries is very challenging given the very limited time to deliver this project. Based on Consultants' experience working in the Pacific, requested data may be likely provided within four months at a minimum.

6. Most disposal sites are unregulated and are operating sub-standardly and cost may not reflect what should have been spent. Also, most disposal sites operate on a fixed budget and do not consider changing disposal pattern and as such performance improvement cannot be monitored through disposal costs.

7. There is difficulty in locating stockpiles since some of these are stored in backyards with no proper storage facility. Most of the stockpiles are unreported.

8. There seems to be ambiguity in measuring success of initiatives since there is no established M & E framework in national implementation of projects unless the project is regional in scope with donor funding

9. The disposal sites are not recording incoming disaster waste since these are emergency actions which are not closely monitored. There may have been disaster wastes dumped anywhere close to the affected areas and remain there for a long time. Demolition may take years.

10. While the introduction of Kobo Toolbox may be helpful in recording data on the spot, there is some degree of reluctance on its use with more preference still given to the paper record. An intensive training on its use as part of a separate data recording training would promote its wider use.

2.3 Key Performance Indicators

The DCMR Framework introduces a series of KPIs (see

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

Each of the KPIs were designed to be reported to using corresponding data collection methodologies, these are:

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

- landfill and stockpile audits

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

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

3 Audit Analysis Results

3.1 Summary of Data Availability

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

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

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

Legend

Calculated with additional data	Calculated in previous report	No data

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

In summary:

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 Solomon 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 Samoa to compare future data to, and to guide subsequent waste management or waste data related activities.

Core KPI 1: Count / capacity of modern waste facilities

Result	**Count of modern waste facilities: 0** • Samoa has two designated waste disposal sites: – Tafaigata, a sanitary dump located on the most populated island, Upolu. – Vaiaata, a semi-aerobic landfill located on the island of Savai'i. • It was confirmed that none of these sites pass the criteria for modern facilities. **Capacity of modern waste facilities (tonnes per annum): 0**
Assumptions	None
Data gaps	• No estimates or parameters were used to calculate the maximum annual processing capacity (tpa) at Tafaigata and Vaiaata.
Key considerations	• The National Solid Waste Management Strategy 2019-2023 highlights key priorities for improving landfill disposal in Samoa, including establishing monitoring systems for rubbish collection and landfill operations, developing manuals and regulations, and exploring options for expanding or relocating the landfill through public-private partnerships. • While the government owns and manages Samoa's landfill sites, private companies are responsible for the daily waste treatment, storage, and disposal operations. • Tafaigata landfill has a gatehouse, recyclables segregation area, hazardous waste incinerator, and wastewater lagoons. However, it cannot be classified as 'modern' as the original waste cells are full, and waste is currently being sent to cells with no lining and therefore lack leachate management. • According to the report, Vaiaata landfill on Savai'i has fewer on-site facilities than Tafaigata and limited monitoring. Whilst leachate is collected, the quality of leachate is not monitored. No information on the daily covering of waste was identified in the report. Therefore, it cannot be classified as a 'modern' facility under the DCMR framework.

Core KPI 2: Count / capacity of unregulated waste facilities

Result	**Count of unregulated waste facilities**: **6** • The facilities that fall under this category includes the two landfills, the two recycling facilities and 2 incinerators within the Tafaigata Landfill. **Capacity of unregulated waste facilities (tonnes per annum): No data** – Tafaigata landfill: 50,000m^2 capacity remaining at time of audit. Designated waste cells are at capacity and need extension. – Vaiaata landfill: 80,000m^2 capacity remaining at time of audit.
Assumptions	None
Data gaps	• No estimates or parameters were used to calculate the maximum annual processing capacity (tpa) of Samoan disposal sites. • No information is available on the current and total capacity of the sites. • No recent information is available on the incinerators.
Key considerations	• 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. • Lack of leachate management at these facilities means that both the environment and community are at risk of hazards due to contamination and material flow. • No daily cover usage at the landfill sites means that these sites are very susceptible to fire incidents and material spillage during climate-related weather events such as cyclones. • The identified unregulated facilities present investment opportunities to upgrade existing sites to align with best practice. Reducing the number of these facilities will lead to better outcomes for the local environmental and community health.

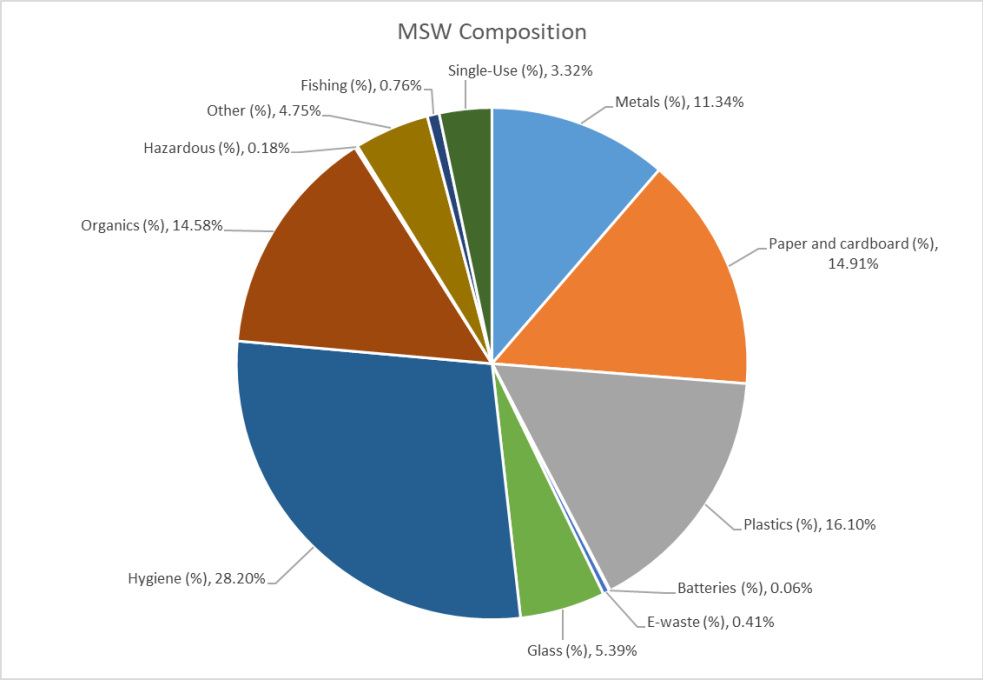
Core KPI 3: National recovery rate

Results	**National recovery rate (%): 7.39%** • Private operators are responsible for all of Samoa's recycling sector. Operation is focused in Apia only. While the government is keen to divert as much waste from the landfill, policies to promote recycling in Samoa are still in the pipeline. • Waste targeted by the private sector includes: Used lead acid batteries, e-waste, glass bottles, aluminium cans, and other scrap metals, PET, used oil • Systematic source separation does not occur in Samoa apart from the beverage container collection cages in Apia. These materials are collected and brought to the Material Recovery Facility at Tafaigata run by the Samoa Recycling and Waste Management Association (SRWMA). • Waste pickers work at landfill to recover valuable recyclable materials. These are then sold to recyclers who compact and ship the materials internationally, or else they are stockpiled in Samoa. • Green waste is often segregated and composted by householders, but no data was available to quantify this.
Assumptions	• Personal communication with the two operating recyclers revealed a recovery of 1,514 tpa of waste in Samoa. • The total waste generated in Apia can be used to calculate a recovery rate within Apia of 24.07% - the proportion of waste which is targeted for recovery in Samoa that is successfully recovered (1,514 tpa) over the amount of waste which is generated annually in Apia (6,289 tpa). • However, the total tonnage of waste generated across Samoa is 20,481 tpa, bringing the recovery rate down to 7.39%. This means recycling should be extended to the rest of the country.
Data gaps	• There is limited information on the total quantity of waste received by disposal facilities. Only information for Tafaigata landfill and the recycling companies was provided. • The waste received at the disposal facilities are not categorised properly and as such targeted materials for recovery cannot be estimated.
Key considerations	• Using the available data collected from the recyclers and audit data of generation rate, approximately 24% of the generated materials in Samoa targeted for recovery are successfully diverted from landfill each year. However, this may not represent a national figure since recycling in Apia was only considered. It is likely though that significant recycling is only happening in Apia. If all the generated waste received in all the facilities are considered, the recovery rate would be 7.39% which is underestimated considering that no significant recycling is happening across the country. • It is recommended that future audits follow the suggested methodologies presented in the DCMR framework to collate data for calculation of this performance indicator.

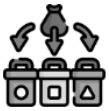
Core KPI 4: Per capita waste generation rate

Results	**Per capita waste generation rate (kg/capita/year): 96.12** – kg/capita/day: 0.263 – kg/household/day: 1.74
Assumptions	• 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, semi-urban or urban), and extrapolated using census data of the national population. • An assumed 'rural' average waste generation rate was used based on household audit data provided for 'rural' Upolu and Savai'i. • The populations of each island in Samoa were sourced from the 2021 national census.
Data gaps	• No information collected for the two islands of Manono and Apolima.
Key considerations	• Future per capita waste generation rates will provide insight into waste management trends and changes for Samoa.

Core KPI 5: Municipal Solid Waste (MSW) Composition

Results	Hygiene is the most prevalent waste category for household waste in Samoa. This is followed by plastics, paper and cardboard, organics, and metals, detailed below: Hygiene: 28.2% Plastics: 16.1% Paper and cardboard: 14.9% Organics: 14.6% Metals: 11.3% Figure 1 Samoa Municipal Solid Waste (MSW) composition (% by weight) 
Assumptions	• Recorded waste audit composition categories were organised into broader categories as used in the PRIF waste audit guidelines. Past audits may record different categories. • The islands of Apolima and Manono were assigned average 'rural' household waste composition proportions based on Savai'i and rural Upolu.
Data gaps	None
Key considerations	• The prevalence of hygiene wastes prompted the development of initiatives to address this issue. There is an ongoing nappy composting project piloted in Samoa. • Plastics is present in significant proportion of the waste stream and as such the ongoing and pipelined plastic initiatives should be sustained. • Subsistence to locally grown or produced food items contributed to the prevalence of organics in the household waste stream. Organics recovery systems, such as a local or national composting service could help support local farmers and reduce the amount of organic waste destined for landfill.

	• Periodic updating of waste composition is valuable to determine changing consumption and disposal patterns as well as impacts of the pandemic and climate change or weather events which may have changed the proportions of waste types sourced from households. • Household waste compositions provide an insight into the types of waste contained inside the MSW stream. Knowledge of the waste types and proportion of these wastes present within the household waste stream allows for targeted decision making and prioritisation of problem waste types.



Core KPI 6: Household waste capture rate

Results	**Household waste capture rate (%): 99.30** – Total weight of household waste generated = 19,758 – Total weight of household waste captured responsibly = 19,620
Assumptions	• The survey and audits did not collect measurements of the weight of waste captured by management services. As such, census data was used and extrapolated across household audit results. $$Household\ waste\ capture\ rate\ (\%) = \frac{weight\ of\ managed\ waste\ (tpa)}{total\ household\ waste\ generated\ (tpa)}$$ Total weight of managed waste is calculated as the product of: $$weight\ of\ managed\ waste\ (tpa) = \frac{household\ collection\ coverage\ (\%)}{total\ household\ waste\ generated\ (tpa)}$$ Collection service coverage (%) is the product of: $$household\ collection\ coverage\ (\%) = \frac{number\ of\ households\ with\ some\ form\ of\ collection\ service}{total\ number\ of\ households}$$ Total household waste generated is the summation of waste generation tonnages for all sampling locations. Waste generation rates for individual sampling locations are calculated by: $$total\ household\ waste\ generated\ (tpa) = average\ waste\ generation\ rate\ of\ location\ \left(\frac{\frac{kg}{capita}}{year}\right) \times location\ population$$ • Using data from Upolu (Apia) and Savai'i to represent all urban and rural areas during KPI calculation results in an inflated calculation result for the weight of managed waste. Extrapolation to the national level results in a very high collection coverage.
Data gaps	• No audit or interview data was recorded on Apolima and Manono. • No information pertaining to the weight of waste captured by waste management services in Samoa.
Key considerations	• A waste capture rate of 94% at the national scale is unrealistic. The audit report states that only 50% of households use the government-provided free collection services in Samoa. (The data used to reach this figure was not identified in the audit report or the raw dataset.) • The calculation for this performance indicator was heavily reliant on a range of assumptions. Most notably, the urban and rural zone collection coverages were extrapolated at the national level, based on survey results presented in the audit report.

	• It is recommended that future data collection includes data from multiple locations representing both rural and urban areas. • This KPI is expected to change significantly in the future as relevant data is collected to calculate the household waste capture rate more accurately.

Core KPI 7: Household collection service coverage

Results	**Household collection service coverage (%): 99.44** • Wastes from households are collected free of charge in Samoa, thus there is a high collection coverage. • The presented figure should be validated using collection zones designated by the government.

Assumptions	• Interview results indicating the number of households with access to a collection service were extrapolated to the national level. From a total of 155 household interviews:
	  ○ 99% service coverage was reported in Upolu.
	  ○ 100% service coverage was reported for Savai'i.
	• With Upolu (Apia) and Savai'i being used representatively for all urban and rural areas during KPI calculation, extrapolation to the national level portrayed that Samoa had near-perfect collection coverage.
	• Both of the sampled islands conducted interviews in areas with existing collection services.

Data gaps	• No data collected for Manono and Apolima. • Information on service coverage within the report pertaining to areas outside of audited locations is limited.
Key considerations	• A coverage of 99% is likely unrealistic. Data from the MNRE in 2019 reported a collection service coverage of 38% for the island of Upolu. The result can be validated from the collection zoning plan of the government to achieve more realistic results compared to surveys. • This figure will become more accurate as additional data is collected using the DCMR Framework's suggested community survey. The survey data collection method will provide more representative results in the future. The result of this indicator is expected to change significantly

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

Results	**Fulfillment of MEA reporting requirements (%): 51.67%** **Convention** / **Status** / **Reporting requirements** / **Reports delivered** **Basel Convention** / Accession / Annual reports (20) / 3 **Minamata Convention** / Ratification / First national report due in 2019 (1) / 1 **Stockholm Convention** / Ratification / 5 reporting cycles (5) / 2
Assumptions	• Only MEA's with mandatory reporting requirements were included in the calculation of this KPI. • For conventions like the Waigani Convention, strict reporting requirements are not enforced and so are not included in the calculation.
Data gaps	None
Key considerations	• Whilst Samoa has satisfied the requirements of reporting to the Minamata Convention, Samoa is behind on national reports for the Stockholm Conventions.

Supplementary KPI 1: Cost of disposal to landfill

Results	**Cost of disposal to landfill ($/tonne): US$28.53** • This estimate is based on the data from the Tafaigata Landfill with an estimated 1.1M Tala projected expenditure and the disposal rate (15,806 tpa) based on the 2021 audit. The Vaiaata disposal rate is estimated at 20% of the Tafaigata Landfill's disposal rate and operating expenditure amounts to 384,960 Tala (personal communication).
Assumptions	• The annual operating cost is only a projection based on previous contracts pending receipt of the actual data. • The disposal rate for Tafaigata Landfill was calculated based on the Upolu population of 160,382 who likely uses Tafaigata Landfill at a rate of 0.27 kg/person/day based on 2021 audit finding. The Vaiaata Landfil disposal was assumed to be 20% of the Tafaigata Landfill disposal.
Data gaps	None
Key considerations	• Completion of the waste facility register suggested by the DCMR Framework will provide sufficient data to accurately calculate this indicator and a benchmark for comparing disposal costs against previous periods, other countries, and the region.

Supplementary KPI 2: Total weight of waste disposed

Results	**Total weight of waste disposed (tonnes per annum): 18,967**
Assumptions	• The disposal rate for Tafaigata Landfill was calculated based on the Upolu population of 160,382 who likely uses Tafaigata Landfill at a rate of 0.27 kg/person/day based on 2021 audit finding. The Vaiaata disposal rate is estimated at 20% of the Tafaigata Landfill's disposal rate (personal communication).
Data gaps	• The tonnages were only estimates and not actually recorded.
Key considerations	• This performance indicator provides an indication of the effectiveness of a country's waste management system in diverting waste from the environment via landfill. This result can be used to evaluate the need for additional investment into waste disposal infrastructure and identify opportunities for improved recycling. • This measurement is expected to change considerably once data is collected from other facilities in the future using the waste facility register suggested in the DCMR Framework.

Supplementary KPI 3: Total weight of waste recovered

Results	**Total weight of waste recovered (tonnes per annum): 1,541** • This result is a summation of recovery weights sourced directly from the audit report and raw dataset. • Waste targeted by private sector recovery operators includes: – Used lead acid batteries – E-waste – Glass bottles – Aluminium cans, and other – Scrap metals – PET – Used oil
Assumptions	None
Data gaps	None
Key considerations	• The quantity of recovered materials increased from the 2023 analysis from 1,080 tpa to 1,514 tpa. • Calculation of this performance indicator requires the completion of the waste facility register with the inclusion of data for any recovery facilities operating in Samoa. This will provide an indication of the effectiveness of a country's waste management systems, recovery systems and infrastructure, and a comparative data point for other countries and time periods.

Supplementary KPI 4: Volume and type of stockpiled hazardous waste

Results	**Volume and type of stockpiled hazardous wastes (m^3):** – Asbestos: 0 (for audited sites) – E-waste: 3 m^3 – Healthcare and pharmaceutical waste: Insufficient data – Used oil: 350 m^3 – Used tyres: 139 m^3 – Obsolete chemicals: 0 (for audited sites)
Assumptions	The quantity of stockpiled used oil was taken from the feasibility study conducted prior to the development of a Used Oil Management Plan.
Data gaps	• Additional stockpiles of hazardous wastes are assumed to exist but cannot be confirmed since no facility registers were returned. • A used oil collection facility is now operating within the Tafaigata Material Recovery Facility. However, there may be more quantities stockpiled in vehicle companies and repair workshops around Samoa which have been recorded.
Key considerations	• The actual volume of other hazardous waste stockpiles in Samoa remains unknown. • Landfill audits, stockpile assessments, and the completion of the waste facility register as proposed by the DCMR Framework will provide the necessary information to calculate this indicator.

Supplementary KPI 5: Marine plastic pollution potential

Results	**Marine plastic pollution potential (tonnes per annum): 22.21**

Assumptions	• Weight of mismanaged waste is estimated from the household audit.
	  ○ This calculation uses the total weight of waste generated, subtracted by the weight of waste captured by collection services. The difference is the estimate for mismanaged waste used in this calculation.
	  ○ Mismanaged waste is defined as all waste which is not captured in collection services, and ends up buried/burned/littered etc.
	• Uses a proportion of plastics captured in MSW composition.

Data gaps	• Requires a more reliable metric for mismanaged waste.
Key considerations	• Waste plastics which are not managed in an environmentally sound manner are assumed to pose a significant risk of polluting oceans and estuarine waterways.

Supplementary KPI 6: Awareness of waste management services

Results	**Awareness of waste services (%): 92.9**
Assumptions	The survey question assessed the collection service as a whole, and was not directed to all possible waste services. Therefore, a value of 1 was assigned as number of available services in the formula to calculate awareness.
Data gaps	No presentation of different waste services in the survey questionnaire
Key considerations	• Monitoring the community's awareness provides an indication of the success of education initiatives and the effective use of existing waste management services. • A significantly high percentage of the population is aware of the waste services provided.

Supplementary KPI 7: Proportion of strategic waste management initiatives implemented

	Proportion of waste management initiatives implemented (%): 84.00 – Number of successfully implemented initiatives = 21 out 25 – Number of pipeline initiatives = 4 • Implemented initiatives include: – Samoa's Waste Management Act 2010 – National Environment Sector Plan 2017-2021 – National Waste Management Strategy 2019-2023 • Pipeline initiatives include: – Container deposit scheme – Wastewater treatment residential extension – Review of MNRE legislation
Assumptions	None
Data gaps	None
Key considerations	• A recent addition is the *Waste (Plastic Bag) Management Regulations* signed in 2018, which bans plastic shopping bags, packaging, straws, styrofoam food containers, and cups, with exemptions for some food packaging. The ban takes effect over several stages, allowing businesses and the public time to prepare.

Supplementary KPI 8: Commercial waste capture rate

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

Supplementary KPI 9: Commercial collection service coverage

Results	**Commercial collection service coverage (%): 100** • The report confirms that businesses on all of Samoa's populated islands have access to collection services based on a commercial survey undertaken as part of the waste audit exercise. • Businesses are responsible for their own waste disposal, either by transport directly to landfill or via collection contractors. The report details the frequency and zones for Upolu and Savai'i.
Assumptions	None
Data gaps	• No information on the total number of businesses participating in collection services nationally. • The audit report did not quantify access to alternative collection services used by businesses (e.g., waste disposal-points or self-haul) however the different disposal methods indicated by respondents were listed.

Key considerations	• Accurate calculation relies on understanding the total number of businesses participating nationally, and specific collection service coverages for businesses. • Completion of business surveys suggested in the DCMR Framework, would provide an indication of how regular, accessible, and affordable collection services are for businesses.

Supplementary KPI 10: Weight of disaster waste disposed

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

4 Conclusion

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

1. There could be a big opportunity to promote the DCMR framework at the national level to enable the availability of more reliable regional data for strategic planning by SPREP through this project. However, this would entail more intensive training at the country level to ensure uptake of knowledge and sustained compliance to the framework. In addition, there should be a pilot year set-up for data collection before new annual KPI calculations are made.

2. Samoa had the benefit of having two waste audits conducted within the same year in 2021 through the through the Plastic Waste-Free Islands Project by IUCN and the Waste Characterisation and Situational Analysis through the World Bank. This provided the opportunity to gather as much data as possible. With further investigation of the raw data, calculations of most of the KPIs were done in this study.

3. The two audit results prompted Samoa to develop policies to address targeted waste issues such as single-use plastics, organics, and nappies.

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

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

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

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

5 Appendix

5.1 Collection Methods

The KPIs are calculated from a range of data sources.

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

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

5.2 KPI Calculations

5.2.1 Calculations for Core KPIs

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

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

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

KPI	Data Source/s	Formula and Notes	Definitions
	Household Community Survey **Census data**	$\frac{Tonnes\ per\ annum\ of\ waste\ captured\ responsibly}{Tonnes\ per\ annum\ of\ waste\ generated}$ This calculation needs to consider the locations where compositional waste audits and surveys were undertaken to apply the audit results appropriately over the PICT. Waste generation and access to formal waste management services vary between settlement types (urban/rural, main island/outer islands, etc.) and as these settlements are distributed uniquely in each PICT it needs to be considered in the calculation. This will be addressed in Section 3.0 Analysis of KPI Results to provide more detail about how the calculation was addressed for each PICT.	and disposed of or recovered in an environmentally responsible manner. Waste capture can include: • Waste collected by a household collection service. • Waste that is self-hauled to a licensed waste disposal facility. • Materials that are source separated and diverted to a recovery facility.
7. Household collection service coverage (%)	**Household Community Survey** **Census data** **Waste department records** (for validation)	**Household collection service coverage** Calculated using the below formula: $\frac{Number\ of\ people\ surveyed\ with\ access\ to\ a\ service}{Total\ number\ of\ people\ surveyed}$ This calculation needs to consider the locations where compositional surveys were undertaken to apply the results appropriately over the PICT. Access to waste services varies between settlement types (urban/rural, main island/outer islands, etc.) and as these settlements are distributed uniquely in each PICT it needs to be considered in the calculation. This will be addressed in Section 3.0 Analysis of KPI Results to provide more detail about how the calculation was addressed for each PICT.	• **Collection service** – a waste collection, transportation, and disposal service for household waste. Collection services can be either a house-to-house kerbside collection or community drop-off point. It is a requirement that the collection service be: • Regular – services are

KPI	Data Source/s	Formula and Notes	Definitions
			provided consistently in a way the does not lead to negative environmental impacts or disrupted engagement. • Accessible – drop-off points should be close to households included in the service. • Affordable – if the service is user-pay, then it should be priced in a manner that is affordable to the target population. **Coverage** – the proportion of the total households that have access to a regular waste collection service.
8. Fulfilment of MEA reporting requirements (%)	**Policy Survey**	**Fulfilment of MEA reporting requirements** Calculated using the below formula: $\frac{Number\ of\ satisfactorily\ completed\ reports}{Total\ number\ of\ reports\ required}$	**Fulfilment** – to satisfy the condition of a reporting requirement to be fulfilled, it must: • Delivered on time (whether by a specific deadline or at a regular reporting interval) • Presented in the required format and units of measurement.

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

5.2.2 Calculations for Supplementary KPIs

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

KPI	Data Source/s	Formula	Relevant Definitions and Notes
			• Organics recovery – the mulching or composting of mixed organics to produce new products. • Energy recovery – waste processing that allows for the capture and reuse of energy.
4. Volume and type of stockpiled hazardous waste (m^3)	**Waste Facility Register** **Alternative: Drones** to identify unreported stockpiles	**Volume and type of stockpiled hazardous waste** The volume in cubic metres (m^3) for each hazardous waste stream: • Asbestos • E-waste • Healthcare and pharmaceutical waste • Used oil • Used tyres • Obsolete chemicals.	**Stockpile** – an accumulation of materials over a specified quantity and time, held in reserve or storage, that typically occurs during: • Temporary storage until enough material is accumulated to treat or dispose of it efficiently. • Temporary storage while commodity prices are low, until the value of the recovered materials rises. • Inappropriate and permanent waste disposal. **Type of Hazardous waste** – waste or

KPI	Data Source/s	Formula	Relevant Definitions and Notes
			waste products that present a risk to environmental or human health, either now or in the future.
5. Marine plastic pollution potential (tonnes per annum)	**Household waste audit** **Household Community Survey** **Census data**	**Marine plastic pollution potential** Calculated in two steps, first quantify the weight of waste in tonnes per annum that is mismanaged using **KPI 4 Rate of household waste generation** and **KPI 6 Household waste capture rate:** Mismanaged waste = $\boldsymbol{KPI\ 4} \times population \times (1 - \boldsymbol{KPI\ 6})$ Secondly, estimating the amount of plastic that has the potential to become marine pollution using the composition of plastic as a percentage (%) identified in **KPI 5 MSW Composition:** Marine plastic pollution potential = $Mismanaged\ waste \times plastic\ composition\ (\%)$	**Marine plastic pollution** – Waste plastics which are not managed in an environmentally sound manner, hence have a risk of polluting oceans and estuarine waterways. The KPI scope only considers macroscopic plastic waste (i.e., plastic that can be identified visually through compositional audits) originating from household sources. **Potential** – a theoretical estimate of the potential weight of plastic that ends up in the ocean annually.
6. Awareness and support of waste management services (%)	**Household Community Survey**	**Awareness and support of waste management services** Calculated using the below formula: $\frac{Number\ of\ positive\ responses}{Number\ of\ available\ services\ \times Number\ of\ participants}$	**Awareness** – based on responses from the community awareness survey, the extent to which knowledge of waste management services is common in a community or on the country level. **Waste management services** – Services available to the public for waste management, including: • Access to waste collection services.

KPI	Data Source/s	Formula	Relevant Definitions and Notes
			• Access to waste drop-off points. • Availability of local recycling services. • Availability of local composting services.
7. Proportion of strategic waste management initiatives implemented (%)	**Policy Survey**	**Proportion of strategic waste management initiatives implemented** Calculated using the below formula: $\frac{Number\ of\ initiatives\ implemented\ nationally}{Number\ of\ planned\ initiatives\ national\ +\ regional}$	**Strategic waste management initiatives** – Actions (usually in the form of projects, policy interventions or new regulation) that are established by national and regional waste strategies. **Implemented** – successfully executed actions that are delivered during the reporting period.
8. Commercial waste capture rate (%)	**Commercial waste audit** **Commercial Community Survey** **National commercial information** (i.e. number, types, and geographic distribution of businesses across the PICT)	**Commercial waste capture rate** Calculated using the below formula: $\frac{Tonnes\ per\ annum\ of\ waste\ captured\ responsibly}{Tonnes\ per\ annum\ of\ waste\ generated}$ This calculation needs to consider the locations where compositional waste audits and surveys were undertaken to apply the audit results appropriately over the PICT. Waste generation and access to formal waste management services vary between settlement types (urban/rural, main island/outer islands, etc.) and as these settlements are distributed uniquely in each PICT it needs to be considered in the calculation. This will be addressed in Section 3.0 Analysis of KPI Results to provide more detail about how the calculation was addressed for each PICT.	**Capture rate** – the proportion of total commercial waste generated that is successfully captured and disposed of or recovered in an environmentally responsible manner. Waste capture can include: - Waste collected by a commercial collection service or that is self-hauled to a licensed waste disposal facility. - Materials that are source separated and diverted to a recovery facility
9. Commercial collection service coverage (%)	**Commercial**	**Commercial collection service coverage** Calculated using the below formula:	**Collection service** – a waste collection, transportation, and

KPI	Data Source/s	Formula	Relevant Definitions and Notes
	Community Survey **National commercial information** (i.e. number, types, and geographic distribution of businesses across the PICT)	$\frac{Number\ of\ people\ surveyed\ with\ access\ to\ a\ service}{Total\ number\ of\ people\ surveyed}$ This calculation needs to consider the locations where compositional surveys were undertaken to apply the results appropriately over the PICT. Access to waste services varies between settlement types (urban/rural, main island/outer islands, etc.) and as these settlements are distributed uniquely in each PICT it needs to be considered in the calculation. This will be addressed in Section 3.0 Analysis of KPI Results to provide more detail about how the calculation was addressed for each PICT.	disposal service for commercial waste. Collection services can be either a provided as a kerbside collection or as a designated drop-off point. It is a requirement that the collection service be: • Regular – services are provided consistently in a way the does not lead to negative environmental impacts or disrupted engagement. • Accessible – drop-off points should be close to businesses included in the service. – • Affordable – if the service is user-pay, then it should be priced in a manner that is affordable to the target businesses. **Coverage** – the proportion of the total businesses that have access to a regular waste collection service.
10. Total weight of disaster waste disposed (tpa)	**Waste Facility Register** **Alternative: Datasets** collected not yet	**Total weight of disaster waste disposed** Calculated as the sum of weight of disaster waste (tonnes) landfilled or received at a waste disposal facility in a country following disaster events.	**Weight** – measured as a weight-based summation of all waste facilities. **Disaster Waste** – Large quantities of

KPI	Data Source/s	Formula	Relevant Definitions and Notes
	reported to the Waste Facility Register **Alternative : Drones** to identify unreported stockpiles		waste caused by disasters. **Disposed** - waste that is appropriately collected and landfilled, as opposed to waste which gets dumped, burned, buried, littered, or otherwise.

6 References

Samoa Bureau of Statistics, 2022. Samoa Population And Housing Census 2021. Available at: https://sbs.gov.ws/documents/census/2021/Census-2021-Final-Report_221122_051222.pdf

World Bank Group, 2021. Samoa Waste Characterization and Situation Analysis Report. Available at: https://www.gefislands.org/sites/default/files/downloads/best-practices/Samoa-Waste-Audit-Report-2021.pdf


EUROPEAN UNION

SPREP
Secretariat of the Pacific Regional
Environment Programme

PacWastePlus
PACIFIC WASTE MANAGEMENT