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Environment Programme



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Timor-Leste National Waste Audit Analysis Report

August 2023



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

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

PacWaste Plus Programme

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

About PacWaste Plus

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

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

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

Key Objectives

Outcomes & Key Result Areas

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

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

Key Result Areas

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

Learn more about the PacWaste Plus programme by visiting



www.pacwasteplus.org

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Map of Timor-Leste



Source: World Atlas, 2021

Glossary

Acronym	Definition
C&D	Construction and Demolition (Waste)
C&I	Commercial and Industrial (Waste)
DCMR	Data Strategy & 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
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 Timor-Leste 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 Timor-Leste

Core KPIs	Result	Supplementary KPIs	Result
1. Count / capacity of modern waste facilities	0 / 0	1. Cost of disposal to landfill (\$/annum)	No data
2. Count / capacity of unregulated waste facilities	4 / Capacity unknown	2. Weight of waste disposed (tpa)	No data
3. National recovery rate (%)	No data	3. Weight of waste recovered (tpa)	No data
4. Per capita waste generation rate (kg/capita/year)	172	4. Volume and type of stockpiled hazardous waste (m ³)	No data
5. Municipal Solid Waste (MSW) composition (%)	Figure (a)	5. Marine plastic pollution potential (tpa)	No data
6. Household waste capture rate (%)	No data	6. Awareness and support of waste management services (%)	No data
7. Household collection service coverage (%)	No data	7. Proportion of strategic waste management initiatives implemented (%)	84.62%
8. Fulfillment of MEA reporting requirements (%)	N/A	8. Commercial waste capture rate (%)	No data
		9. Commercial collection service coverage (%)	No data
		10. Total weight of disaster waste disposed (tpa)	No data

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

Legend

Sufficient data	Limited data	No data
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Timor-Leste MSW Composition

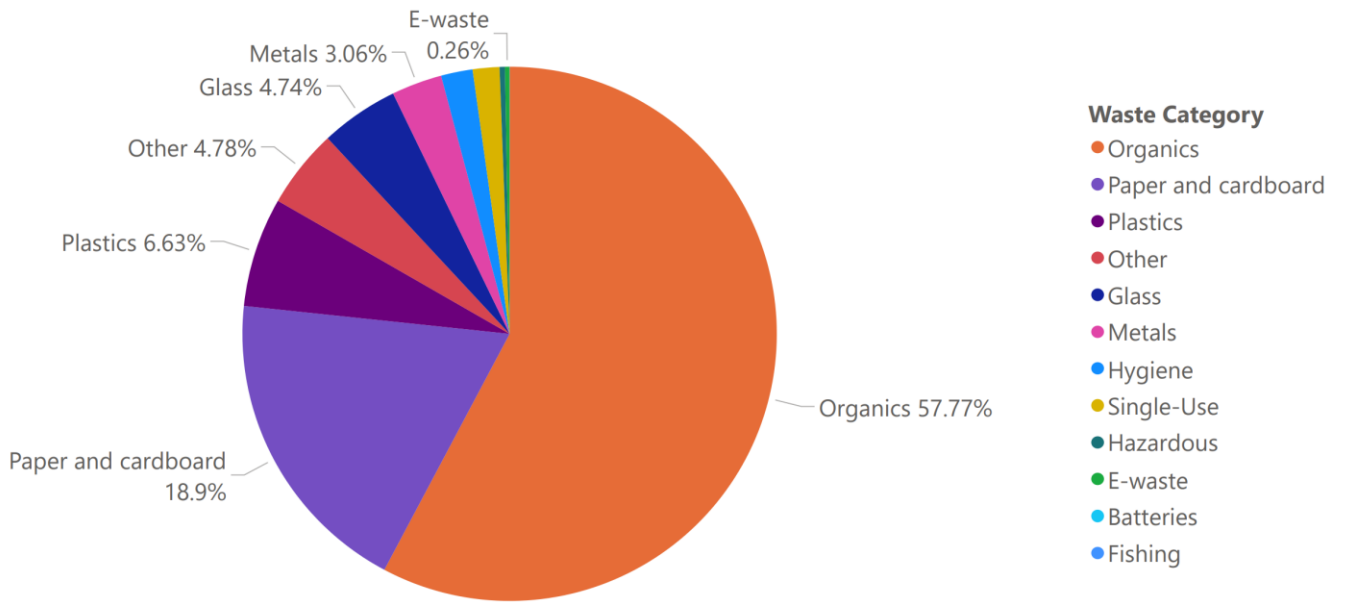


Figure (a) Timor-Leste Municipal Solid Waste (MSW) composition (% by weight)



1 Introduction

1.1 Background

Timor-Leste is one of fifteen countries which took part in the PacWaste Plus Programme implemented through Secretariat of the Pacific Regional Environment Programme (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.

Waste management in Timor-Leste is limited by a lack of collection services and waste management infrastructure. Burning and dumping at disposal sites are the main methods of waste disposal in the country. The audit found no household or business waste collection services in the audited locations.

Approximately 200 communal disposal points are provided by the Public Administration and available for community use, and some areas in Dili are serviced by private sector businesses. At the time of the audit report, new landfills were planned for construction in the Seichal area (to replace dumpsites at Baucau), and at Tibar.

Investment in infrastructure, implementation of data-guided decision making, and increased general waste management education will improve the current situation.

1.2 Purpose and Aim

The purpose of this audit analysis and report is to establish a baseline position for Timor-Leste waste data and waste management systems.

The aim of this report is to:

- Validate pre-existing national waste audit data; and
- Build national waste insights based on new key performance indicators (KPIs) to understand waste management trends.

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

1.3 Scope

The scope of this report is limited to the following waste data collected in Timor-Leste:

- **Timor-Leste waste audit report 2021:** The audit was undertaken between August and September 2021 and provided an evaluation of household and business waste generated in Timor-Leste. Audit data and information was obtained via interviews and waste collections from 120 households and 20 businesses, followed by sorting and weighing. The audit report also provided an assessment of the state of Timor-Leste's landfills including landfill audits and stockpile assessments.

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

Timor-Leste consists of the eastern portion of the Island of Timor, as well as Atauro Island located north of Dili, Jaco Island on the eastern-most tip of the island, and Oecussi, an enclave situated in the northwestern part of the island and surrounded by Indonesia. Over the past fifty years, the population of Timor-Leste has steadily grown and has nearly doubled in size. As of 2020, the country is home to more than 1.3 million people. The population is well distributed across the island with approximately 31% residing in urban areas and the remaining 69% living in rural regions. Timor-Leste is divided into 13 districts or municipalities, with each having its own capital city. These districts or municipalities are further divided into sub-districts (or administrations), which in turn are divided into village administrative divisions known as 'Suku'. The villages can be composed of one or multiple hamlets.

The *Timor-Leste Strategic Development Plan 2011-2030* focuses on social capital, infrastructure development, and economic development. It aims to improve waste management, control pollution, and protect the environment. The National Directorate of Basic Sanitation Services in the Ministry of Public Works are responsible for developing policies and plans for waste management. The *National Sanitation Policy* sets standards, guidelines, and roles for government agencies to implement five-year plans for waste reduction, reuse, and recycling.

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

- National government: The government of Timor-Leste was delegated authority for matters regarding environmental protection legislation, which encompasses waste management.
- *Decree Law 26/2012 Basic Law on the Environment* defines waste and assigns responsibilities for managing solid waste: it requires the government, industry, and citizens to collect, store, process, reduce, reuse, and recycle waste. It prohibits the import of hazardous waste and imposes penalties for non-compliance. The law also requires the national government to establish landfills and waste treatment processes. The Public Prosecutors Office administers the law.
- Local/municipal government: The local/municipal government is responsible for the investment and maintenance of solid and liquid waste management systems.



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
Timor-Leste 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 household and business waste collection Services • Household and business waste composition • Customs data
2015 Timor-Leste 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 Timor-Leste Waste Audit 2021

The audit was undertaken between August and September 2021 and utilised the Waste Audit Methodology produced by Pacific Regional Infrastructure Facility (PRIF).

The audits took place over one month in Baucau and Covalima. Data was collected from households in urban, peri-urban, and rural areas as well as commercial premises. A total of 120 household and 20 commercial samples were gathered, half of the samples were taken from Baucau and the rest were taken from Covalima.

In addition, landfill audits were planned and implemented. The Tibar disposal site at Dili is the only formal landfill in Timor-Leste. It is understood all other districts rely on open and uncontrolled dumping sites for disposal. However, as the audit was conducted in Baucau and Covalima, disposal behaviours can only be confirmed for these locations. The audit did not find recovered materials stockpiles in either of the Baucau and Covalima locations.

Table 2 Sample locations for audits

Sample Location	Population (2022)	Classification
Baucau	133,881	Rural
Covalima	73,909	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

- The audit data provided for 'rural' areas (Baucau and Covalima) (see Table 2) is assumed to be representative of the rest of the country, in this case, despite no audit data being available for the Dili 'urban' area.
- All population estimates used to calculate performance indicators are based on national census data from 2015, which predates the audit (completed in 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 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		
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:

The audit reports provided adequate information for Core KPIs 4, 5, and 8, and Supplementary KPI 7.

- There was limited data available to calculate Core KPIs 1 and 2.
 - Storage and processing capacities for waste facilities were not identified in the audit report.
- There was inadequate data and information available which rendered all other KPIs unable to be determined.
 - No specific operational costs were presented for the landfills in Timor-Leste.
 - Not all disposal facilities were represented in the audit report.
 - No measurements for recovered waste or waste recovery facility information was identified.
 - No estimates were provided for collection service access or coverage.
 - No hazardous waste stockpiles were identified in the audit report.
 - Limited data to calculate commercial KPIs.

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 Timor-Leste.

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 Timor-Leste 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: 0</p> <ul style="list-style-type: none"> A total of four sites were audited, comprising of the Tibar landfill, two uncontrolled dumpsites in Baucau (at Bahu and Tirilolo) and one uncontrolled dumpsite in Covalima (Haemanu). It is understood that the two dumpsites in Baucau were being used ahead of the planned construction of a landfill in the Seichal area (located to the east of Baucau). Tibar disposal site, in the capital city of Dili, is the only formal landfill in Timor-Leste. All other districts in the country rely on uncontrolled dumpsites for waste disposal. It is understood that waste at Tibar is partially compacted by bulldozers before profiling and intermediate covering is applied. It is not known if the cells in Tibar landfill are lined. As such, Tibar disposal site cannot be classified as a 'modern' waste facility. It is understood a new engineered landfill will be constructed at Tibar. At the time of the audit report, planning for the remediation of the current disposal site was underway. <p>Capacity of modern waste facilities (tonnes per annum): 0</p> <ul style="list-style-type: none"> Since none of the disposal facilities in Timor-Leste meet with 'modern' requirements, the capacity of modern facilities is 0.
Assumptions	<ul style="list-style-type: none"> None
Data gaps	<ul style="list-style-type: none"> Additional information is required to confirm if cell linings exist at Tibar landfill.
Key consideration	<ul style="list-style-type: none"> There are no landfills or dumpsites in Timor-Leste which are up to 'modern' standards. Lack of leachate management at these facilities means that both the environment and community are at risk of hazards due to contamination and material flow. No daily cover usage at the landfill sites means that these sites are very susceptible to material flow during climate-related weather events such as cyclones. Investment to upgrade existing landfills in Timor-Leste to meet with modern standards/best practice will lead to better outcomes for the local environment and community health.



Core KPI 2: Count / capacity of unregulated waste facilities

Result	<p>Count of unregulated waste facilities: 4</p> <ul style="list-style-type: none"> A total of four sites were audited, comprising of the Tibar landfill, two uncontrolled dumpsites in Baucau (at Bahu and Tirilolo) and one uncontrolled dumpsite in Covalima (Haemanu). It is understood that the two dumpsites in Baucau were being used ahead of the planned construction of a landfill in the Seichal area (located to the east of Baucau). Tibar disposal site, in the capital city of Dili, is the only formal landfill in Timor-Leste. All other districts in the country rely on uncontrolled dumpsites for waste disposal. The waste audit took place in Baucau and Covalima, and as such, reliance on uncontrolled dumpsites can only be confirmed for these locations. The four disposal sites identified within the audit report are all classified as ‘unregulated’ due to the lack of leachate management systems and/or implementation of daily cover. <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"> No estimates or parameters were used to calculate the maximum annual processing capacity (tpa) of any of the four Timor-Leste disposal sites. Disposal sites in areas besides Dili, Baucau, and Covalima were not examined in the audit. It is assumed that they are also ‘unregulated’ but are not included in the facility count for this indicator because the total number is unknown. No information is available on the total capacity of the sites and if they are exceeding storage capacity.
Key consideration	<ul style="list-style-type: none"> All facilities are ‘unregulated’. The number, location, name and operations of all landfills and dumpsites should be collated for future reporting purposes. Lack of leachate management at these facilities means that both the environment and community are at risk of hazards due to contamination and material flow. No daily cover usage at the landfill sites means that these sites are very susceptible to material flow during climate-related weather events such as cyclones. 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	<p>National recovery rate (%): No data</p> <ul style="list-style-type: none"> • Audit reports provided no information regarding the existence or operations of recycling facilities in Timor-Leste. • Previous studies note the existence of multiple private sector recyclers targeting plastics and steel. It was not confirmed if these operations were still active in the audit report. • A memorandum of understanding (MOU) has been signed by the Government of Timor-Leste for the construction of a recycling plant.
Assumptions	<ul style="list-style-type: none"> • None
Data gaps	<ul style="list-style-type: none"> • No information on the total quantity of waste received by all facilities (tpa). • No information on the total mass of material diverted from landfill (tpa). • No dedicated recovery facilities noted in audit reports. • No information on the estimated mass of material recovered per annum (tpa) at any facility.
Key consideration	<ul style="list-style-type: none"> • A national recovery rate was not able to be calculated. • Poor market conditions for some consolidated recycled materials are a barrier to expanding current recycling operations.



Core KPI 4: Per capita waste generation rate

Results	<p>Per capita waste generation rate (kg/capita/year): 172</p> <ul style="list-style-type: none"> – kg/capita/day: 0.471 – kg/household/day: 2.53
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, semi-urban or urban), and extrapolated using census data of the national population. • Where districts had no data, an assumed 'rural' average waste generation rate was used based on household audit data. • Population data used to calculate per capita information was based on 2015 census results.
Data gaps	<ul style="list-style-type: none"> • No information recorded outside of Baucau and Covalima.
Key consideration	<ul style="list-style-type: none"> • Future per capita waste generation rates will provide insight into waste management trends and changes for Timor-Leste.



Core KPI 5: Municipal Solid Waste (MSW) Composition

Results

Organics is the most prevalent waste type for household waste in Timor-Leste. This is followed by paper & cardboard waste and then plastic.

- Organics: 57.77%
- Paper & Cardboard: 18.99%
- Plastics: 6.63%

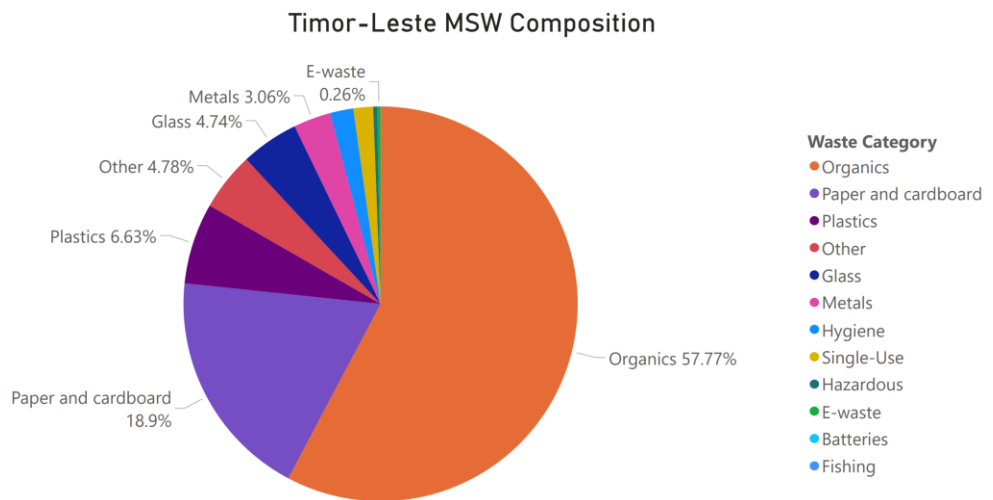


Figure 1 Timor-Leste Municipal Solid Waste (MSW) composition (% by weight)

Assumptions

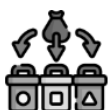
- None

Data gaps

- Future and past audits may record different categories. Presented categories are based on the categories identified by the PRIF audit guidelines.

Key consideration

- The prevalence of organics in the household waste stream is likely due to reliance on local subsistence agriculture, as rural communities often have fewer options for food and goods, which can result in a greater reliance on locally grown or produced items.
- Organics recovery systems, such as a local or national composting service could help support local farmers and reduce the amount of organic waste destined for landfill.
- The last household audit took place just under five years ago. Impacts of the pandemic and climate change / 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 (%): No data</p> <ul style="list-style-type: none"> – Total weight of household waste generated = 230,288 tpa – Total weight of household waste captured responsibly = no data
Assumptions	<ul style="list-style-type: none"> • None
Data gaps	<ul style="list-style-type: none"> • There was no measurement of collection service access during the audit, and as such this performance indicator could not be calculated. It is likely that there is no formal collection service in Timor-Leste aside from the collection points in Dili. • As Dili was not audited during the 2021 waste audit, the amount of waste collected via the drop-off points in Dili is not able to be quantified.
Key consideration	<ul style="list-style-type: none"> • Aside from collection-drop off points in Dili, it has been assumed that there is no formal waste collection service in Timor-Leste.



Core KPI 7: Household collection service coverage

Results	<p>Household collection service coverage (%): No data</p> <ul style="list-style-type: none"> • Aside from waste drop-off points in Dili, there are no formal collection services in Timor-Leste. As Dili was not audited during the 2021 waste audit, the coverage of collection services via the drop off points is not able to be quantified.
Assumptions	<ul style="list-style-type: none"> • None
Data gaps	<ul style="list-style-type: none"> • There was no measurement of collection service access during the 2021 waste audit, and as such this performance indicator could not be calculated. • It is likely that there is no formal collection service in Timor-Leste aside from the collection points in Dili.
Key consideration	<ul style="list-style-type: none"> • Expanding coverage in Timor-Leste would result in better waste management outcomes for the country. Waste which is not captured via waste management services is at risk of being burned, littered, buried, or dumped, and poses a risk to both environmental and community health.



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

Results	<p>Fulfillment of MEA reporting requirements (%): Not applicable</p> <ul style="list-style-type: none"> Timor-Leste has not signed the 1995 Waigani Convention or the Basel Convention. However, it is a Special Observer to the Pacific Islands Forum. Australia has established regulations, called the Hazardous Waste (Regulation of Exports and Imports) (Imports from Timor-Leste) Regulations 2003, for the import of hazardous wastes from Timor-Leste. Timor-Leste has ratified the Montreal and Kyoto Protocols.
Assumptions	<ul style="list-style-type: none"> None
Data gaps	<ul style="list-style-type: none"> Only MEA's with mandatory reporting requirements were included in the calculation of this KPI. For conventions such as the Rotterdam Convention, strict reporting requirements are not enforced and so are not included in the calculation.
Key consideration	<ul style="list-style-type: none"> Timor-Leste is not party to MEA's relevant to waste and waste management



Supplementary KPI 1: Cost of disposal to landfill

Results	<p>Cost of disposal to landfill (\$/tonne): No data</p> <ul style="list-style-type: none"> No figures were identified in the audit report on the operational costs for any of the facilities analysed. The report states that it is expected that the expenses of maintaining open dumping sites in Baucau and Covalima are low since there is minimal management undertaken, mainly burning and basic upkeep.
Assumptions	<ul style="list-style-type: none"> None
Data gaps	<ul style="list-style-type: none"> No information presented in audit reports on the annual facility operating cost for any facilities. No information to calculate the annual quantity of waste disposed (tpa).
Key consideration	<ul style="list-style-type: none"> There was no data available to calculate this KPI. 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): No data <ul style="list-style-type: none">Information regarding the total amount of waste disposed at Tibar and the audited disposal sites in Baucau and Covalima was not provided.
Assumptions	<ul style="list-style-type: none">None
Data gaps	<ul style="list-style-type: none">No information to calculate the annual quantity of waste disposed (tpa) at disposal facilities.
Key consideration	<ul style="list-style-type: none">No information was available regarding the amount of waste disposed at dumpsites and landfill in Timor-Leste.The calculation of this KPI requires the completion of the waste facility register . It provides 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 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 information presented on recorded weights of any waste recovered at any disposal site in Timor-Leste in examined audit reports.Lack of dedicated recovery facilities in Timor-Leste mentioned in audit report.
Key consideration	<ul style="list-style-type: none">The calculation of this KPI requires the completion of the waste facility register . It provides 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: Volume and type of stockpiled hazardous waste

Supplementary KPI 4: Volume and type of stockpiled hazardous waste	
Results	<p>Volume and type of stockpiled hazardous wastes (m³):</p> <ul style="list-style-type: none"> – Asbestos: no data – E-waste: no data – Healthcare and pharmaceutical waste: no data – Used oil: no data – Used tyres: no data – Obsolete chemicals: no data
Assumptions	<ul style="list-style-type: none"> • None
Data gaps	<ul style="list-style-type: none"> • No hazardous waste stockpiles were identified or examined during the audit.
Key consideration	<ul style="list-style-type: none"> • The volume of hazardous waste stockpiles in Timor-Leste is unknown. • 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

Supplementary KPI 5: Marine plastic pollution potential	
Results	<p>Marine plastic pollution potential (tonnes per annum): No data</p>
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 consideration	<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.



Supplementary KPI 6: Awareness of waste management services

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 – Number of survey participants
Key consideration	<ul style="list-style-type: none"> • Completion of the 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 (%): 84.62%</p> <ul style="list-style-type: none"> – Number of successfully implemented initiatives = 11 out of 13 – Number of planned/pipeline initiatives = 2 • Implemented initiatives include: <ul style="list-style-type: none"> – Investment Strategy for the Management of Solid Urban Waste in Dili (2016) – Decree-Law 2/2017 – Urban Solid Waste Management System – Strategic Development Plan 2011-2030 • Pipeline initiatives include: <ul style="list-style-type: none"> – A memorandum for the development of a national recycling plant, signed by the National Government. – Plastic clean-up initiatives at the local level.
Assumptions	<ul style="list-style-type: none"> • None
Data gaps	<ul style="list-style-type: none"> • None
Key consideration	<ul style="list-style-type: none"> • The Government of Timor-Leste has implemented several decree-laws to enable waste management via legislation: <ul style="list-style-type: none"> – Decree-Law 26/2012, the Basic Law of the Environment, contains a section on solid waste management. – Decree-Law 3/2016 gives Municipal Administrations the authority to manage water and solid waste systems. – Decree-Law 2/2017 established Timor-Leste's urban solid waste management system, which was previously non-existent.



Supplementary KPI 8: Commercial waste capture rate

Results	<p>Commercial waste capture rate (%): Insufficient data</p> <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 information provided on the total amount of commercial waste successfully captured by management services. No information provided for the number of businesses in Timor-Leste in the audit report. No information on the total amount of waste generated by businesses.
Key considerations	<ul style="list-style-type: none"> Accurate calculation relies on an estimate of total businesses in country, and total commercial waste generated, and adequately representative commercial waste generation rates. Completion of community surveys will provide an indication of both how many businesses are using collection services, and to what extent businesses use the service.



Supplementary KPI 9: Commercial collection service coverage

Results	<p>Commercial collection service coverage (%): Insufficient data</p> <ul style="list-style-type: none"> Household and commercial waste collection services were not identified as being provided in the Baucau and Covalima audit locations. Though the audit locations did not reveal any residential or commercial waste collection services, the report noted that the Dili Public Administration offers communal waste disposal points across the capital city. Additionally, private sector companies service certain areas.
Assumptions	<ul style="list-style-type: none"> None
Data gaps	<ul style="list-style-type: none"> No information provided on the access that businesses have to alternative collection services (e.g. waste disposal-points or self-haul). No information on the total number of businesses participating nationally.
Key considerations	<ul style="list-style-type: none"> Accurate calculation relies on understanding the total number of businesses participating nationally, and specific collection service coverages for businesses. Completion of the business survey 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 for any ‘disaster waste’ carrying vehicles entering the facility will help reconcile waste amounts disposed if these wastes are not managed separately.





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