Small Island Developing States

WASTE MANAGEMENT Outlook

SUMMARY FOR DECISION-MAKERS

UN environment

Technology for Environment

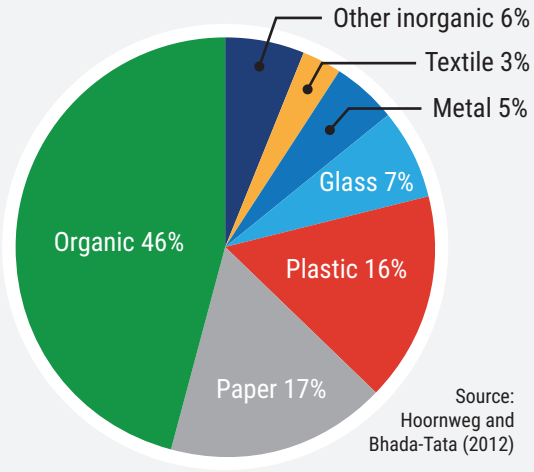
The State of Waste Management in SIDS

MUNICIPAL SOLID WASTE

GENERATION

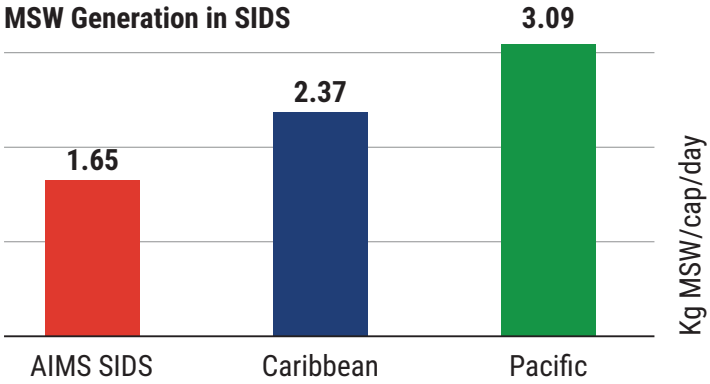
- SIDS inhabitants generate, on average, 2.3 kg MSW per person, **48% higher than the world average**.
- **Tourism** increases the quantity of waste generated in SIDS with **seasonal peaks**.

Average MSW composition in SIDS



Source: Hoornweg and Bhada-Tata (2012)

MSW Generation in SIDS



WASTE COLLECTION

- The average MSW **collection rate reaches 85%**. The other 15% is discarded into the environment or burned.
- **Outdated collection vehicles** and **narrow roads** are among the challenges to be addressed.

DISPOSAL

- Waste disposal via **landfilling**, illegal **dumping** and backyard **burning** are favored in most cases, at the expense of more sustainable waste treatment technologies such as composting, anaerobic digestion and recycling.
- **Roughly 80% of litter** ends-up in the **ocean** or on coastlines, potentially affecting **tourism**.
- **Sustainable practices are emerging**. Governance, behavioral and infrastructural challenges still hinder the implementation of these practices.

RECYCLING

- **Recycling rate** in SIDS is low and it is not measured effectively (**lack of data**).
- Recycling provides an **opportunity for job creation and improved livelihoods**, particularly for the informal sector and for women.

Main Industrial Waste Generators in SIDS

Mining

Tourism

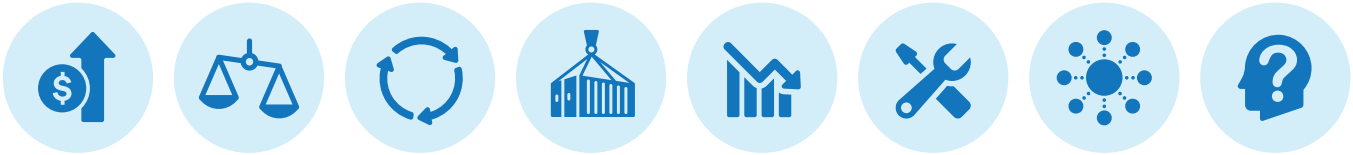
Forestry, Land clearing and logging

Fishing

Agriculture

Farming

Challenges to the development of Material Recycling in SIDS



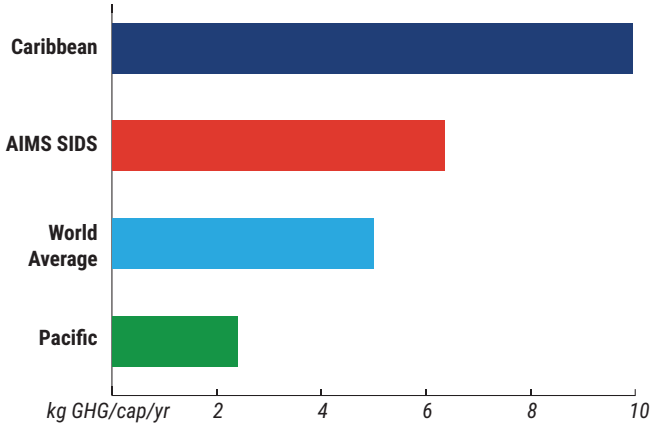
WASTEWATER

- Wastewater is generated by the **local population**, but also by **hotels**, **yachts** and **cruise ships**.
- Untreated, it can **contaminate fresh water**, causing **health issues**.
- Most wastewater in SIDS is **uncontrolled** or **untreated**. Only **32%** of people in SIDS are connected to **wastewater treatment systems** and **45%** to **wastewater collection systems**.
- **Sewage Treatment Plants** are often inadequate or inoperative.

EMISSIONS

- Gaseous emissions are **wastes**, often overlooked in waste management.
- Main sources of gaseous wastes on SIDS are **oil and gas operations**, **vehicles** and **diesels generators** (fossil fuel combustion), contributing to **climate change**, **air pollution** and **acid rain** formation.
- A significant **source of particulates** is **open burning of MSW**.

GHG emissions in SIDS



The Economic Impact of Mismanaged Waste in SIDS

Reducing waste can **save SIDS between USD35 and USD400 per tonne**, depending on the activity and the technologies used.

Sub-standard waste management practices lead to loss of ecosystems, acceleration of climate change effects, loss of national revenue (from tourism, for example), and the cost of healthcare for affected population. **The costs are borne by society**.

SIDS	Impact	Financial implication	Cost (USD/ capita/year)	Ministry to bear the cost
Palau	Health	Increased cost of pharmaceuticals, hospital time and lost labor productivity	36	Health Ministry
Palau	Fisheries	Land-sourced pollutants causing water pollution which cause loss of near shore fish catch	4.5	Economic Development Ministry
Palau	Beach pollution	Solid waste and marine litter requiring clean up	50	Health Ministry
St Lucia	Health	Increased cost of public health risks and damage to health	16	Health Ministry
St Lucia	Tourism	Loss of aesthetic value. Effects on tourism and residents, based on willingness to pay for preservation of the environment	156	Tourism Ministry, local governments
Trinidad and Tobago	Health	Increased cost of public health risks and damage to health	17	Health Ministry
Trinidad and Tobago	Tourism	Loss of aesthetic value. Effects on tourism and residents, based on willingness to pay for preservation of the environment	2	Tourism Ministry, local governments

Priority Waste Streams in SIDS

WHAT CAN BE DONE

HAZARDOUS WASTE

Including chemical, medical, electronic, lead-acid batteries, asbestos and used oil is a key priority in SIDS due to **lacking capacity** and **cost effectiveness**.

To better manage hazardous wastes SIDS can:

- **Build Regional cooperation models** to capitalize on synergies between countries.
- **Enforce legislation and regulations**, and **Conduct Audits**.

CONSTRUCTION AND DEMOLITION WASTE

To reduce C&D waste SIDS can:

- **deconstruction rather than demolition**
- **on-site waste separation**
- **reuse crushed stones and concrete as base material**
- **reuse rocks, bricks and concrete for land reclamation or shore protection**
- **give credit for returned unused construction materials**
- **only order amounts needed for a job**

TYRE WASTE

require **alternative solutions** to **landfilling** and **open burning**.

To reduce tyre waste SIDS can **quantify** the problem and **abopt environmentally sound technologies** like:

- Tyre-derived aggregates (TDA) to recover ground rubber, metal and devulcanized rubber (**materials recovery**).
- Convert waste tyres in conventional fuels or recycle them in steel production (**energy recovery**).

PLASTIC WASTE

SIDS **lack technologies** to manage plastic waste onshore. **International markets** start resisting plastic waste imports.

To **reduce** the **impact** of plastics **and better manage plastic waste**, SIDS can:

- Improve waste management systems;
- Find alternatives to single use plastics;
- Educate consumers to make environmentally friendly choices;
- Enable voluntary reduction strategies; and
- Ban or introduce levies on single-use plastic.

DISASTER WASTE

Disasters can generate the **equivalent of decades of waste**; and **extreme weather events** are expected to increase with **climate change**.

To increase preparedness SIDS can:

- Improve disaster-response planning.
- Undertake regular street sweeping and cleaning of drains to reduce the risk of clogging (for instance, floods).
- Ensure financial contingencies for debris clearing and for the recovery phase.
- Take preventative action to deconstruct already unstable buildings.
- Targeted training for local government.

Disaster Waste in the Small Islands		
Tsunami (Earthquake)	**Flood (Heavy Rain)**	**Cyclone (Strong Wind)**
Mixed waste (destroyed housing/building). Bulky waste (furniture, white ware, car bodies, green waste).	Contaminated mixed waste with muddy water (destroyed housing, furniture, white ware, car bodies, trees, commercial goods at stores).	Mixed waste (fallen trees, green waste, destroyed housing).
Relatively clean and re-usable if segregated on site (easier to recover materials).	Contaminated and not re-usable and unsanitary (difficult to recover materials).	Relatively clean and re-usable if segregated on site (easier to recover materials).

Upcoming Issue

NANOMATERIALS

Potential threat to **human health** and the **environment**. SIDS should progress waste management programmes for nanoparticles.

Technologies for SIDS

Before technologies are purchased a thorough assessment process is needed including:

Addressing government's key needs as well as local operational **requirements**

The financial viability of technologies, their cost/benefit, and policy levers that can **facilitate deployment**

An **assessment process** that includes screening, scoping and detailed assessment involving a wide range of stakeholders

Quantitative procedures to consider **varying scenarios**

Look at how the proposed technology **affects the waste system** rather than just the efficiency of the technology itself

The ability of **local people** to maintain and operate the technology

Placing importance on information **expertise** and **stakeholder participation**

Environmentally sound technologies may be applicable for:

Waste collection and transfer

Composting and biogas

Incineration

Landfills

Hazardous waste treatment

Wastewater

What Needs to Happen to Improve Waste Management in SIDS

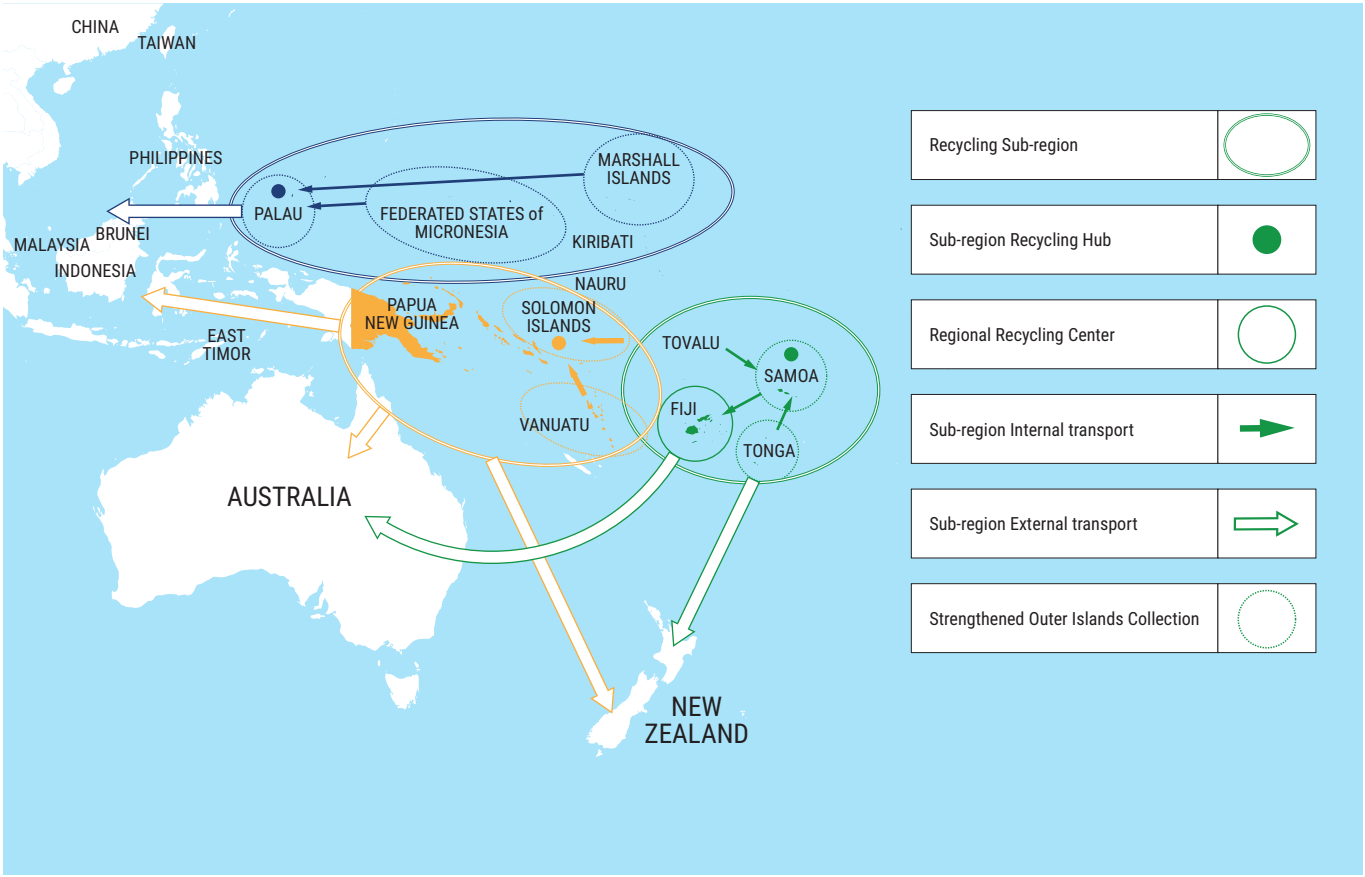
NATIONALLY AND LOCALLY
Integrated waste management requires an effective legislative framework to enable financial planning and technological infrastructure improvements, while maintaining an inclusive engagement with stakeholders.

REGIONALLY
Focused Regional cooperation on hazardous waste, recycling, marine litter, greenhouse gas emission reduction and/or wastewater is necessary for SIDS to move towards a circular economy. Regional cooperation can enable SIDS to learn from each other's experiences.

A **'hub and spoke'** regional cooperation model, similarly to the one used for recycling in the Pacific, would provide a viable method to manage priority waste streams on SIDS.

Standardized and improved data collection methods are needed to enable data-led decision making for SIDS and provide a common measurement system.

Example of "Hub and Spoke" regional cooperation model for recycling in the Pacific



National and Local actions to improve Waste Management Systems in SIDS

Coordination: Clarify roles, responsabilities and coordination among all levels of government.
Legislate: Improve disposal, provide tools for reduction, reuse and recycling wastes. Develop Integrated Waste Management Strategies and Action Plans to provide a consistent policy framework to guide improvements.
Enforce: Enforcement of current waste legislation.
Monitor: Collect data for evidence-based policy development, Improve monitoring and evaluation. Quantify priority wastes locally and develop effective and economically sustainable programmes of action.

Plan: Allocate budget and identify funding streams to support implementation of IWM including charging systems, deposit refund schemes, taxes and subsidies.
Budget: Other funding sources include international funding bodies, private sector and community contributions.
Incentivize: Design financial incentives to promote recycling as a secundary resource economy. Support investment by the private sector by creating enabling conditions.

Engage: Involve the private sector, community groups, informal sector, and civil societies to capitalise on their know-how and strenghten buy-in and cooperation.
Raise Awareness to reduce waste and improve implementation of legislations. Awareness initiatives are best when practical and implemented in conjunction with other broader initiatives.
Educate: Inter-generational long-term education programmes are vital for the uptake of a circular economy.
Formalize: The informal Sector is crucial for waste diversion and formalising their role creates jobs, particlarly for women, improving helth and safety conditions.

Assess: Conduct a sustainability assessment (socio-economic and environmental considerations) involving key stakeholders before purchase.
Consider Fitness: Technologies must be simple to operate, reliable, and easy to repair and maintain with local parts and skills.
Maintenance Capacity: Local people should be trained to be able to maintain and operate the equipment.
Integrated approach: Examine how the proposed technology affects the entire waste system rather than just the efficiency of the technology itself.

About this SIDS Waste Management Outlook

It covers all **58 SIDS** in the Caribbean, Pacific, and AIMS
(Atlantic, Indian Ocean, Mediterranean and South China Seas) regions.

It adopts an integrated approach by addressing **solid**, **liquid** and **gaseous wastes**,
with the goal to provide a **pathway for SIDS** to gradually move **to** a **circular economy**.

Waste Management contributes to all 17 Sustainable Development Goals

Graphic supplied with assistance from Zoë Lenkiewicz, WasteAid UK and contributor to Be Waste Wise

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