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Hello, let’s save the Ocean.

Seychelles

Advancing SDG14.1 through Circular Solutions

Photo: The Ocean Agency / Ocean Image Bank

Executive Summary

Seychelles has demonstrated strong leadership and commitment to building a more sustainable waste system setting ambitious national targets to reduce per capita waste generation by **10%**, increase plastic packaging recycling by **25%**, and divert **25%** of total waste from landfill. Like many Small Island Developing States (SIDS), it faces structural challenges: **geographic isolation, limited land, and a small population** which make it difficult to achieve the economies of scale needed for cost-effective recycling and waste solutions.

To support evidence-based policy solutions, **the Seychelles Department of the Blue Economy partnered with the International Platform for Ocean Sustainability (IPOS)** to conduct this case study using **IPOS OceanGPT**, a large language model tailored for ocean-related decision-making. The study explores a central question:

Photo: OceanX

Which materials can be economically recycled in Seychelles, and which should be reduced or eliminated to cut marine pollution?

This work directly supports SDG target 14.1, which calls for significantly reducing marine pollution from land-based sources by 2025.

The report identifies the **materials with the strongest economic potential for local recycling**—PET bottles, aluminum cans, scrap metal, cardboard and paper, glass, and HDPE plastics—and recommends expanding efforts around these. It also flags **materials unlikely to ever be cost-effectively recyclable in SIDS**, including multi-layer films, polystyrene, PVC, PETG, and small-format flexible plastics. These should be prioritized for reduction, redesign, or elimination. In parallel, the analysis highlights **marine pollution risks** that stem not only from mismanaged plastics, but also from landfill leachate, domestic wastewater, agricultural runoff, and fishing gear debris. **Addressing these risks requires an integrated strategy that goes beyond recycling alone.**

Photo: OceanX

Based on this evidence, the report outlines **four strategic priorities** for action:

1. **Build a foundational knowledge base** with up-to-date local data to ensure a sound evidence base for decision-making.

2. **Stop ongoing leaks from landfills** through improved design, operations, and diversion of organics and recyclables.

3. **Reduce imports of non-recyclable plastics** via targeted bans, incentives for alternatives, and extended producer responsibility (EPR) mechanisms.

4. **Unlock investment for circular infrastructure**, including source separation systems, composting and anaerobic digestion, and a hub-and-spoke recycling model anchored on Mahé.

Each strategic priority is paired with policy and financing options designed to support implementation. Together, these actions provide a **roadmap for Seychelles to deliver on its sustainability goals, reduce land- and sea-based pollution, and demonstrate circular economy[1] leadership among island nations.**

1. A circular economy is a system where products and materials are kept in circulation through processes like reuse, recycling, remanufacture and composting. A circular economy approach tackles global challenges like pollution by decoupling economic activity from the consumption of finite resources. (Ellen MacArthur Foundation & UNEP, 2021)

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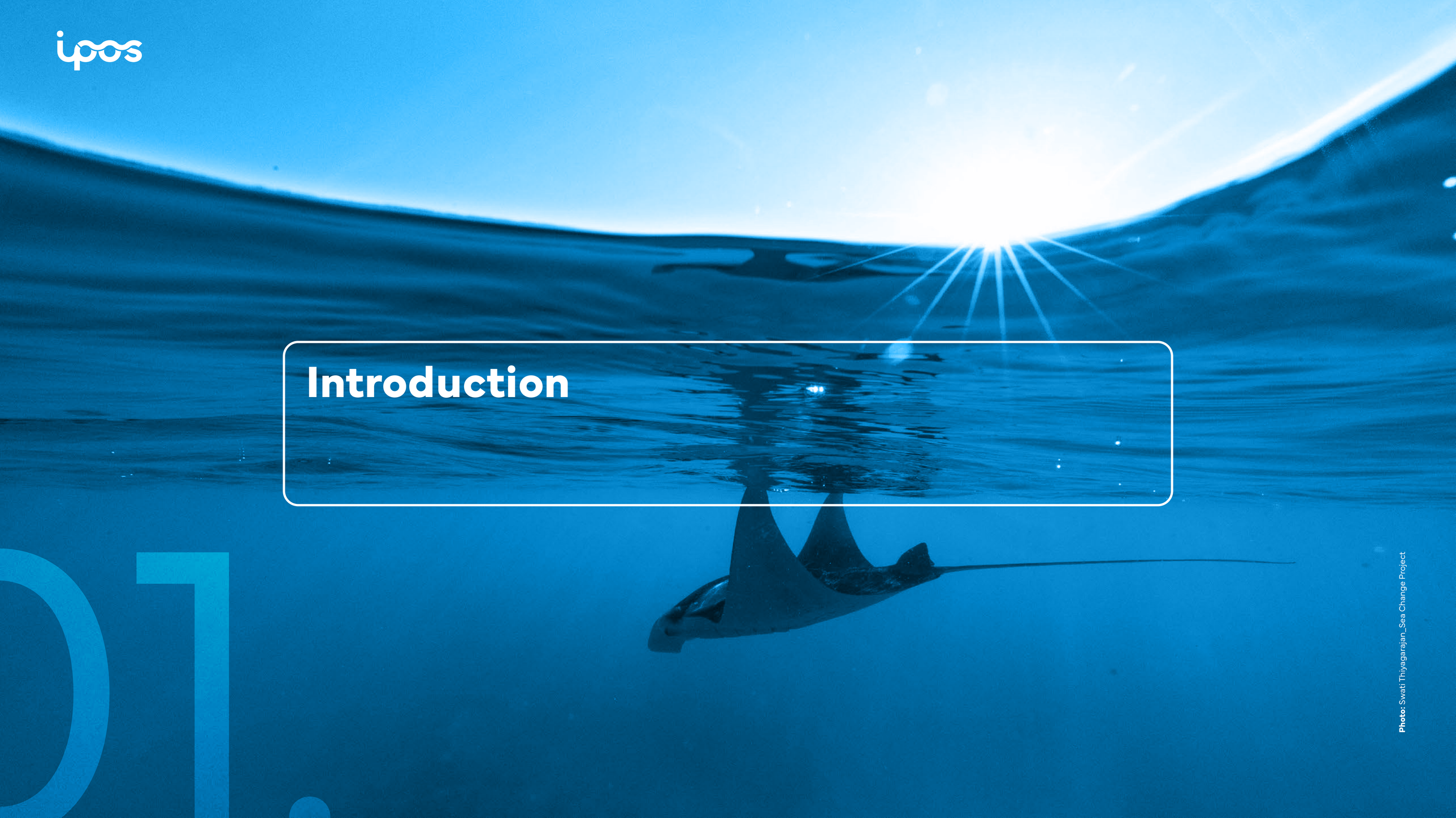


Photo: Swati Thiyagarajan_Sea Change Project

This report presents the findings of a case study developed in partnership with the Seychelles Department of the Blue Economy and the International Platform for Ocean Sustainability (IPOS) to explore the potential for circular economy solutions that can reduce marine pollution while supporting sustainable development. The work was conducted as part of a pilot to test the IPOS OceanGPT, a large language model tailored for ocean-related decision-making, by applying it to real-world policy and ocean science questions identified by the Seychelles government.

This collaboration between IPOS and Seychelles reflects a shared commitment to support national priorities while advancing global ocean sustainability goals. This case study directly supports **SDG 14.1: Prevent and significantly reduce marine pollution of all kinds**.

Photo: OceanX

The central research question addressed in this report is:

Which materials can be recycled economically in Seychelles and other Small Island Developing States (SIDS), and which materials are unlikely to ever be cost-effectively recyclable—making them priorities for reduction or elimination? Which materials are most important to reduce marine pollution?

The objective of this report is to provide Seychelles policymakers with **clear, evidence-based** prioritization of materials to guide Seychelles' policy, investment, and innovation efforts—particularly toward **low-cost strategies that reduce land- and ocean-based pollution**. Lessons from other SIDS are woven throughout to ensure relevance and applicability to the Seychelles context.

The report is structured as follows:

- **Section 1: Introduces** the objectives, targets and methodology of this report.
- **Section 2: Summarizes the current waste landscape** in Seychelles, including waste composition, infrastructure, and key constraints common to other SIDS.
- **Section 3: Identifies materials** that are (1) recyclable with economic potential, (2) unlikely to be cost-effectively recyclable in Seychelles and similar SIDS, and (3) most important to address to reduce marine pollution. These materials are prioritized for reduction, redesign, or low-cost processing alternatives.
- **Section 4: Introduces strategic priorities for action** including to (1) build an up-to-date knowledge base to inform decisions, (2) stop ongoing landfill leakage, (3) reduce imports of non-recyclable plastics, and (4) unlock investment for circular infrastructure. Each priority includes targeted policy actions and financing strategies to support implementation.

Photo: Swati Thiyagarajan_Sea Change Project

1.1. Objectives

This case study aims to support Seychelles in targeting the most problematic materials in its waste stream—those that are both not economically recyclable and significant contributors to marine pollution—through cost-effective, scalable strategies based on a circular economy approach.

1.2. Seychelles' Targets

Seychelles has set ambitious waste and emissions goals in line with its broader sustainability agenda. The **2020–2035 Solid Waste Master Plan** sets a bold vision to achieve **zero waste and zero emissions from the waste sector**.

It outlines a strategic infrastructure investment plan that includes:

- Development of facilities to reduce final disposal through improved recycling systems
- Upgrades to existing landfill sites to improve environmental and operational performance (COWI A/S & European Union, 2018)

In alignment with this, the Government through the forthcoming **Circular Economy Roadmap and Action Plan** has set additional measurable targets (World Bank, 2024):

10%

Reduce per capita municipal solid waste generation by **10%**

10%

Decrease total waste generation relative to GDP by **10%**

25%

Increase the recycling rate of plastic packaging by **25%**

25%

Divert **25%** of total waste from landfill disposal

Seychelles has also committed to a **conditional target to reduce methane related emissions from the waste sector by 80%**, from 71.2 $ktCO_2e$ (business-as-usual) to 17.8 $ktCO_2e$ (World Bank, 2024).

Photo: Lewis Burnett / Ocean Image Bank

Barriers to reaching targets

While Seychelles demonstrates strong political commitment to sustainable waste management, it faces a set of structural challenges common to many Small Island Developing States (SIDS). **Geographic isolation, limited land availability, and a relatively small population** make it difficult to achieve the economies of scale that typically underpin cost-effective waste solutions.

The current waste infrastructure is under increasing pressure as waste volumes continue to grow. Landfill sites are nearing capacity, and ongoing issues with operation and maintenance further constrain their effectiveness. A high volume of imported, short-lived goods (often heavily packaged) adds to the burden, with limited options for recycling or export.

Financially, the system relies heavily on public subsidies to operate. While commercial entities pay for their own waste disposal, most households and small businesses do not contribute directly to the cost of waste services, limiting the resources available for system improvements (World Bank, 2024).

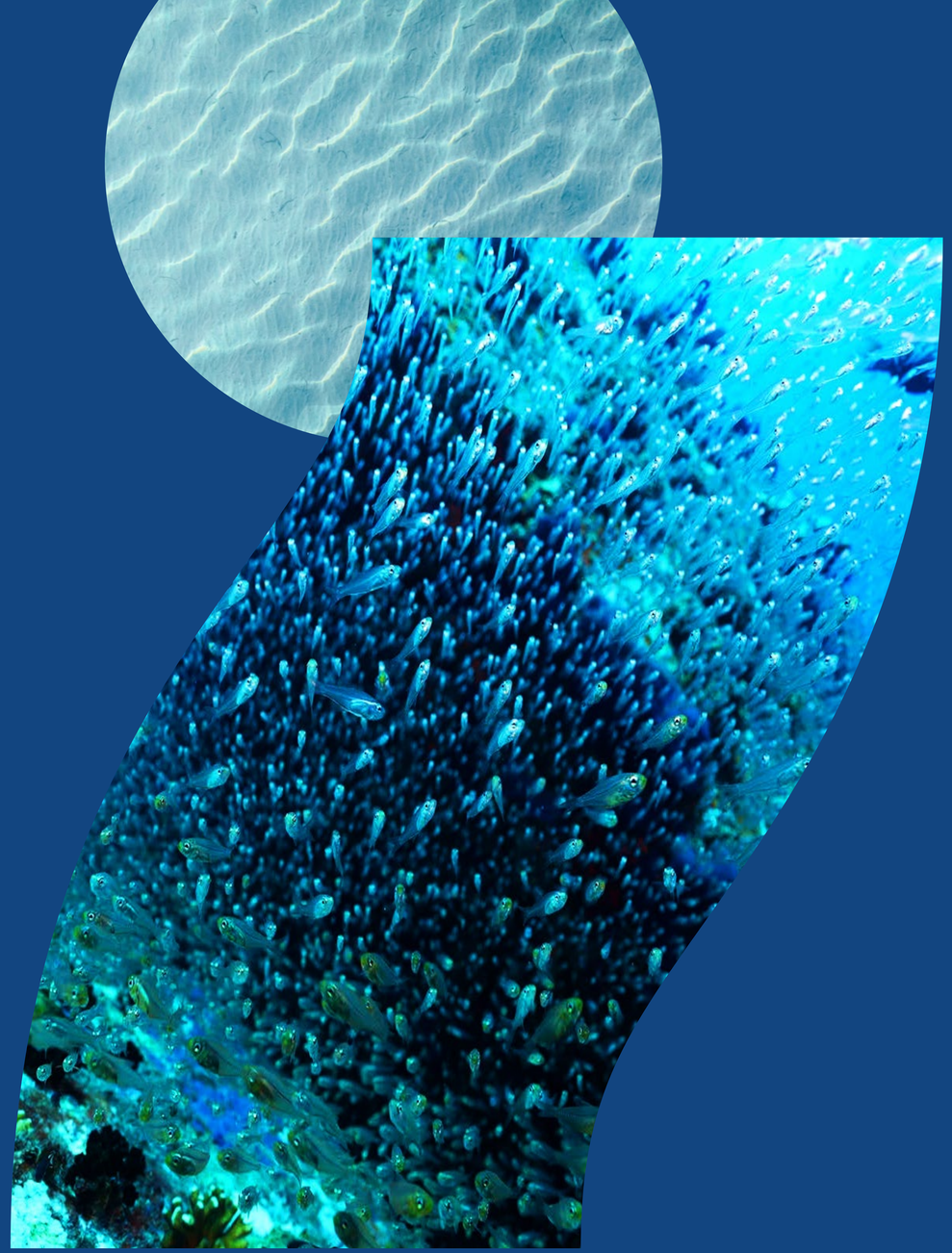


Photo: OceanX

1.3. Methodology

This report draws on a combination of AI-generated analysis, government provided data, and expert review to provide a robust and contextually grounded response to the core research question. The approach integrates insights from the IPOS OceanGPT, Seychelles' national documents, and comparative case studies from other Small Island Developing States (SIDS).

IPOS OceanGPT is used as a research copilot to **support the IPOS team** by identifying relevant answers to Seychelles' questions and drawing from published science and global case studies. Human experts define the report's overall structure, logic flow, and final recommendations, while IPOS OceanGPT provides justifications and case examples that help support those recommendations.

The research process followed four key steps:

1. **Sub-question Design:**
   To address the overarching research question, the analysis was broken down into a series of focused sub-questions.

2. **AI-Led Literature Synthesis via IPOS OceanGPT:**
   These sub-questions were posed to IPOS OceanGPT, a large language model developed by IPOS and trained on over 800,000 open-source ocean science and policy publications. In addition to global literature, the model was also supplied with national reports, datasets, and strategy documents provided by the Seychelles Department of the Circular Economy to ensure local relevance and specificity.

3. **Comparative SIDS Analysis:**
   The IPOS OceanGPT analysis was conducted both for Seychelles specifically and for other SIDS to provide a comparative perspective. This allowed for the identification of both shared constraints and transferable solutions relevant to small island contexts.

4. **Expert Review and Validation:**
   The draft responses and prioritization analysis generated by IPOS OceanGPT were reviewed by the IPOS team of ocean experts as well as three independent external topic experts[2], ensuring insights were grounded in sound reasoning.

This hybrid approach enabled rapid synthesis of a vast body of knowledge while ensuring the outputs remain context-sensitive, technically credible, and decision-useful for Seychelles and its partners.

2 **Internal Peer Reviewers:** Joi Danielson, Managing Partner, Vital Ocean; Vincent Kneefel, Chief of Impact, Vital Ocean; Dr. Kelsey Archer Barnhill, Deep Sea Coordinator, Towards IPOS; Tanya Brodie Rudolph, Co-lead, Towards IPOS; Adrien Vincent, Senior Consultant to Towards IPOS, Albatross Advisory; Prof. Sheila Heymans, Executive Director, European Marine Board. External Peer Reviewers: João Pequeno, Marine and Environmental Sciences Centre, University of Portugal; Prof. Ursula Siebert, Institute for Terrestrial and Aquatic Wildlife Research Institute, Hanover; Mike Webster, Indonesia Materials and Circular Economy, SYSTEMIQ Ltd.

Waste Composition & Management in Seychelles

2.1. Current waste generation and waste composition

The current waste generation in the Seychelles is estimated at around 80,000 - 90,000 tons per year.

Based on a medium development scenario (COWI A/S and European Union, World Bank, 2024). **By 2035, this amount is projected to increase to 130,000 tons.** This translates to around ~246 tons per day or an estimated 1.57 - 2.45 kg/person/day (Darmstadt University, 2017, World Bank et al., 2018).

Tourist waste generation is assumed to follow the urban population rate, with an average tourist stay of 10 days. The medium-growth scenario uses an 11% yearly increase in tourist numbers (based on 2014 - 18 data), while low and high-growth scenarios assume 5% and 15% increases respectively (COWI A/S & European Union, 2018). Even with this conservative estimate, assuming tourist waste generation mirrors the urban population rate, it likely underestimates actual waste contributions. **In many touristic regions, tourists generate substantially more waste than local residents.** Consequently, tourism's weight in overall waste generation in Seychelles is likely underrepresented in this model.

The waste characterization of Seychelles is based on several studies, most notably a 2017 Waste Characterization Study carried out by Darmstadt University (Darmstadt University, 2017, World Bank, 2024). Key findings can be found in the table beside:

Table 1. **Overall waste composition in the Seychelles.**

Waste Type	Percentage
Organic waste food & kitchen / garden	**31-50%**
Paper & Cardboard	**9-18%**
Plastics	**8-16%**
Plastics PET	**4%**
Other Plastics films, etc.	**9%**
Metal	**5-8%**
Glass	**3-5%**
Textile	**3%**
Electronic Waste	**1-2%**
Other rubber, mixed, etc.[3]	**14-29%**

3 'Other' includes construction wood, construction waste, tires and rubber, textiles, electronic waste and unsortable waste.

2.2. Waste collection, sorting and recycling

Photo: Nico Marin / Ocean Image Bank

Waste collection

Municipal waste collection in Seychelles covers all three main islands—Mahé, Praslin, and La Digue—and typically operates six days per week. The system is organized into two distinct streams: residential and commercial (COWI A/S & European Union, 2018).

Residential waste collection

For households, waste is collected from curbside communal bins (typically 240-liter capacity) by private contractors managed by the Landscape and Waste Management Agency (LWMA). Coverage is nearly universal, with close to 100% of residential waste collected. These services are fully subsidized by the government, meaning households do not pay directly. As population and urban development have increased —particularly on Mahé island— the number of collection points and private contractors has also grown, significantly raising LWMA's operating expenditures.

For 20 years, the primary contractor was STAR Seychelles (COWI A/S & European Union, 2018). However, as of April 2019, eight contractors signed six-year contracts for household waste collection and bin site cleaning on Mahé, Praslin, and La Digue for daily removal of domestic waste from communal bin sites, as well as the weekly collection of bulky and green waste (COWI A/S & European Union, 2018).

While Seychelles has nearly universal formal waste collection coverage, especially for residential areas, anecdotal reports and parallels with other SIDS suggest that **informal practices such as the open burning of household waste may still occur in some communities.**

Table 2. **Municipal waste collection providers (LWMA, n.d.)**

Mahé

- North region - STAR Seychelles
- Central region - Ronny Truck Service (RTS)
- Central/East region - WASTEA and R Dynasty
- East region - WASTEA
- South region - S&S Cleaning Agency
- West region - HMR Group

Praslin

- Explorer Investment PTY
- B.S. Excavation

La Digue

- Island Waste Collection

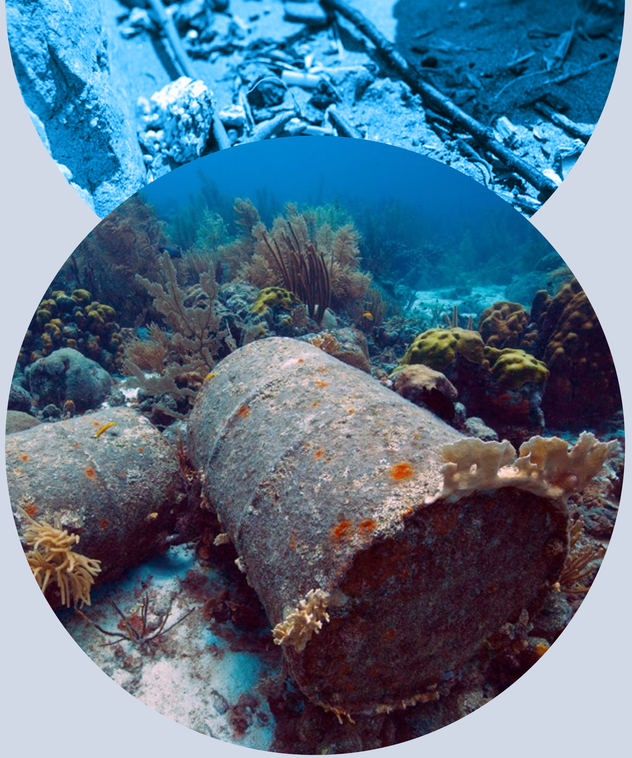


Photo: Jill Heinerth / Ocean Image Bank

Commercial waste collection

In contrast, commercial waste is not managed by LWMA; instead, businesses are required to arrange and pay for their own waste collection through direct contracts with private service providers as a condition of their operating permits. **This commercial waste stream is subject to minimal regulatory oversight**, and service levels can vary. Tourist areas often receive more frequent service due to higher waste volumes, but overall, **the system places a stronger emphasis on front-end collection than on downstream treatment or disposal.**

Waste processing and recycling

One of Seychelles' most recognized and successful recycling initiatives is the Redeem System—a national deposit-refund scheme that has become a key pillar of the country's early efforts toward a more circular economy.

Through this program, consumers pay a small levy on eligible beverage containers, including PET bottles, aluminum cans, and Seybrew glass bottles, which can later be returned to authorized redemption centers for a partial refund. The scheme not only **incentivizes waste recovery** but also supports income generation, particularly for informal waste collectors. PET and aluminum are then exported for recycling, while Seybrew bottles are washed and reused locally. Widely viewed as a model of success, the Redeem System receives strong public support and provides a practical foundation for expanding material recovery efforts in Seychelles (COWI A/S & European Union, 2018, Lai et al., 2016).

Despite the success of the Redeem System, waste sorting remains limited overall, and **there is no organic/non-organic source separation at the household level**. The country currently **lacks a national materials recovery** facility (MRF), and recyclables are typically hand-sorted in small-scale facilities or by informal actors, leading to limited processing capacity. The existing sorting infrastructure is largely concentrated on materials already covered by the Redeem System—PET and aluminum—with some additional recovery of scrap metal, cardboard, and paper (COWI A/S & European Union, 2018; Lai et al., 2016). One company, Navin's Paper Recycling Company, processes paper and cardboard locally, though it struggles to remain financially viable (Lai et al., 2016). There is **no central waste transfer station. The Solid Waste Masterplan for Seychelles (2020-2035)** recommends developing one on Mahé to consolidate and pre-treat waste prior to export (COWI A/S & European Union, 2018).

Outside of the Redeem System, recycling remains minimal, estimated at between 1-5% of the national waste stream (COWI A/S & European Union, 2018, World Bank, 2024). Recovery of other materials—such as non-beverage glass, mixed plastics, and e-waste—is limited, with most ending up in landfills. Some car battery collection and export takes place, but the handling of hazardous materials like sulfuric acid is not formally regulated. Still, the Redeem System illustrates the potential for targeted, well-managed recovery programs, and offers a promising base from which broader circular economy strategies can grow.

Landfill disposal

Landfilling is the primary method of waste disposal in Seychelles.

Seychelles has four active landfills, two on Mahé (Providence I and Providence II), one on Praslin (Amitié), and one on La Digue (L'Union). All are government-owned. The La Digue and Mahé landfills are (at least partly) engineered. Providence II, constructed in March 2015, is considered a sanitary landfill because it is lined with plastic (COWI A/S & European Union, 2018). It was built with EU funds to replace Providence I, which had reached capacity (Lai et al., 2016).

However, the leachate treatment plants at both Providence II and the La Digue landfill are out of operation (COWI A/S & European Union, 2018). **The main landfill on Mahé is expected to reach capacity in 2025-27.** Additional **landfill space is challenging given land scarcity** with potential landfill regions occupying valuable space that could be used for other purposes like agriculture or tourism (International Monetary Fund, 2017, COWI A/S & European Union, 2018).

Table 3. **Seychelles landfills context**

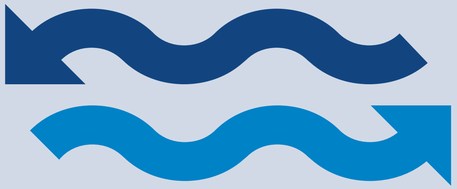
	Island	Design	Concern
Providence I	Mahé	Non-engineered - closed	**Leachate seeps into ocean daily** Frequent fires from uncontrolled methane buildup
Providence II	Mahé	Partially engineered 2 cells - 710 km³	Expected to reach capacity 2025-27 No leachate treatment No methane capture / flaring
Amitié	Praslin	Non-engineered	Close to agriculture land **No liners or leachate control**
L'Union	La Digue	Engineered sanitary landfill	**No leachate treatment** Located near coastal wetland and river

Other waste infrastructure

Incinerators: Small incinerators exist on various islands, **primarily operated by hotels**. A medical waste incinerator operates at the Seychelles hospital, and two non-operational incinerators are located at the seaport and airport (COWI A/S & European Union, 2018).

Composting: While some small-scale home composting initiatives exist at schools, hotels and farms, they are limited in scale and **lack centralized support**. The previously operational central composting plant on Providence landfill is out of function due to a lack of market for the compost (COWI A/S & European Union, 2018). In addition, **as organic waste is not collected separately** at the household and commercial level, **clean feedstock for composting or anaerobic digestion is hard to obtain**.

Figure 1. Map of main solid waste management facilities on Mahé (Meylan et al., 2018).



Waste regulation including import & export restrictions

Seychelles, as a Small Island Developing State (SIDS), imports most of its goods and exports only a small, specific part[4] of its waste, creating a linear system where waste accumulates rapidly with limited options for disposal or recovery.

The country's import and export regulations are shaped by national laws, international conventions, and practical constraints on infrastructure and scale.

The primary legal framework governing waste management in Seychelles is the **Environment Protection Act (EPA) of 1994, revised in 2016**. While not a dedicated "Waste Management Act," the EPA addresses waste management in several sections. It mandates authorization from the Ministry responsible for Environment (referred to as the Ministry) for waste disposal and empowers the Minister to establish regulations controlling waste management, including specifying product requirements related to hazardous substances or recycled content, and imposing fees on importers or manufacturers to cover disposal costs (COWI A/S & European Union, 2018).

4 Hazardous or recyclable materials recovered through the Redeem System.

2.3. Importing and exporting waste

Importing

Seychelles has implemented **import bans** on specific items: beverage containers not made of PET or glass (2013), plastic bags (2017), plastic utensils and polystyrene takeaway boxes (2017), and single-use plastic straws (2019) (COWI A/S & European Union, 2018, Government of Seychelles, 2016).

Importing waste and hazardous materials into Seychelles is prohibited, except under special conditions and for specific types of recyclable materials determined by the Minister. Contravening this regulation incurs penalties, including re-exportation at the importer's expense. The EPA further prohibits the export of hazardous waste without Ministry authorization and prior informed consent of the receiving country (Government of Seychelles, 2016).

Exporting

Due to the absence of domestic recycling infrastructure, **Seychelles relies heavily on the export of recyclable and hazardous materials for processing**. The most commonly exported waste streams include PET bottles and aluminum cans—primarily recovered through the Redeem System—as well as scrap metal, paper and cardboard, lead-acid car batteries, and, occasionally, electronic waste (e-waste) (COWI A/S & European Union, 2020; Lai et al., 2016). Exports are typically managed by private sector operators, who are required to obtain permits from the Ministry of Agriculture, Climate Change and Environment (MACCE) and adhere to Seychelles' obligations under the Basel Convention, which includes prior informed consent for the transboundary movement of hazardous waste. Exporters must also comply with international standards for handling, packaging, and transport to ensure environmental and public safety. The Seychelles Revenue Commission (SRC) is responsible for managing the customs declaration and clearance process for all waste shipments. These export channels remain a vital component of the country's waste management system, given its small scale and limited capacity for in-country material recovery.

Photo: OceanX

2.4. Comparative Analysis with other Small Island Developing States

Mauritius

Mauritius has made steady progress in addressing plastic pollution and improving its plastic recycling systems through a combination of policy reform, public engagement, and investment in circular economy initiatives. Recognizing the environmental and economic risks posed by plastic waste—particularly in a small island context—Mauritius has implemented a series of **legislative bans on single-use plastics, introduced producer responsibility mechanisms, and promoted partnerships between the public and private sectors**. While challenges remain, the country is laying important groundwork for a more sustainable and circular approach to plastic use and recovery (Foolmaun et al., 2022).

The key actions Mauritius has taken:

- Post-consumer PET bottles are collected through an informal network of paid pickers, NGOs, and 332 designated collection points and then shredded, baled, and exported, primarily to South Africa, for recycling.
- Polymers like HDPE, LDPE, polystyrene, and polypropylene are recycled locally in Mauritius and transformed into products such as tables, benches, and garbage bins.
- The government has implemented various initiatives to curb plastic usage including banning certain types of plastic bags and imposing excise duties to discourage their use.
- A roadmap for a plastic-free Mauritius by 2030 is underway, involving consultations with stakeholders to develop concrete policies, strategies, and action plans. This includes a phased banning approach, prioritizing certain plastic categories and ensuring the availability and affordability of biodegradable or natural alternatives.

Palau

Palau has emerged as a Pacific island leader in plastic waste reduction and recycling through a combination of strong legislative action, communitybased systems, and innovative reuse practices. Despite its small size and remote location, Palau has developed a robust framework for managing plastic waste, supported by effective public policies and a strong sense of environmental stewardship. Its initiatives span from **deposit-refund schemes and plastic bans to local recycling infrastructure and waste segregation systems**, creating an integrated model that demonstrates what is possible for SIDS facing similar challenges.

Palau's key efforts:

- Palau has a successful container deposit system for recyclable plastics, achieving a 90% recovery rate and processing approximately 3 tonnes of waste per month. This system is financially sustainable due to the dedicated recycling fund established under Recycling Act 2006 (Government of Palau, 2017).
- Palau has reduced plastic bag usage in their Plastic Bag Use Reduction Act (RPPL No. 10-14 2017) and single use plastic eating products (Styrofoam Cups and Plates, and Plastic Products Prohibition Container Deposit (Amendment) Act, 2018 (2018-0054) (Farrelly et al., 2020)
- Recycling Center: The Koror State Recycling Center processes various materials. Glass bottles are either repurposed through crafts or crushed for use in concrete pavements . The center also shreds tires for construction and filters cooking oil and used motor oil to be used as an additive in a Plastic-To-Oil facility (Government of Palau, 2017).
- Waste Segregation: Segregation facilities exist in 7 out of 12 hamlets in Koror, with plans for expansion. This system separates various waste types, including beverage containers, paper, cardboard, and different plastic types (caps, PET, HDPE, LDPE, and PP) (Government of Palau, 2017).

Barbados

Barbados has adopted a phased, well-signaled approach to eliminate single-use plastics (SUPs) and polystyrene. A dual strategy paired **regulation with economic incentives**, which helped stimulate material innovation while easing compliance.

The key actions Barbados has taken:

- A policy announcement in 2018 signalling a phased approach to eliminate SUPs and polystyrene, which gave businesses almost two years to adjust to policy actions.
- The ban was implemented in stages: importation of targeted items was prohibited in April 2019, followed by a ban on their sale and distribution in July 2019, with full enforcement from April 2020.
- The policy was developed in collaboration with industry leaders and supported by the newly established Ministry of Marine Affairs and the Blue Economy, fostering shared ownership of the transition (Clayton et al., 2020).
- To support adoption of alternatives, the government offered tax concessions to businesses importing biodegradable packaging.
- Barbados also introduced strict penalties under the Control of Disposable Plastics Bill, with fines up to US $25,000 or imprisonment for noncompliance, signaling serious commitment (Clayton et al., 2020).

Prioritization of Materials

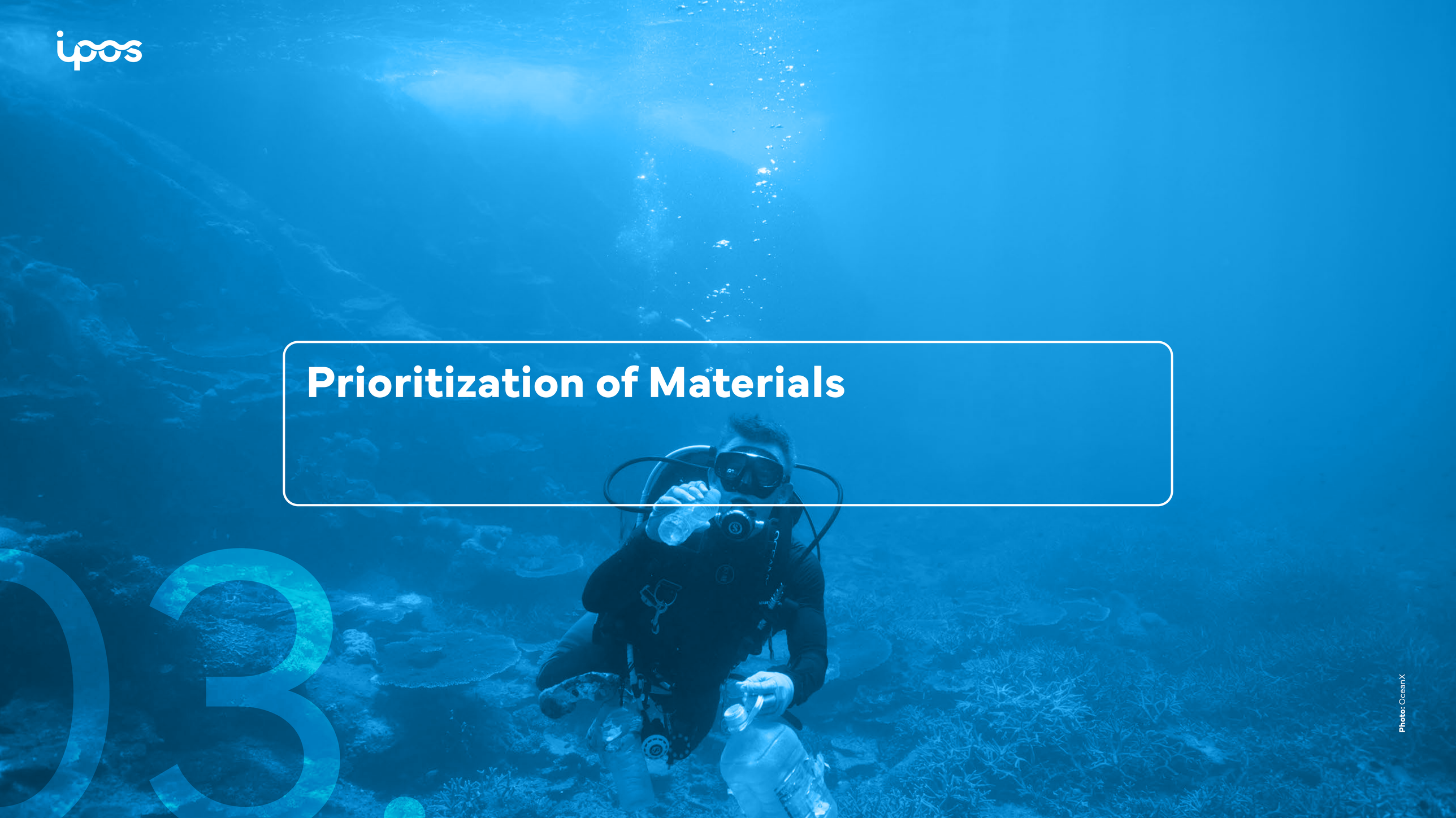


Photo: OceanX

3.1. Recyclable Materials with Economic Potential

A material flow analysis conducted on Mahé as part of the Solid Waste Management Study, (Agricole, et al., 2016), conducted in collaboration with the University of Seychelles, identified economically recyclable waste streams based on economic and ecological potential, recovery rate, and current landfill deposition rates (Lai et al., 2016). The study aimed to understand the current state of recycling systems, identify options for waste separation and collection improvement, and understand perspectives on recycling at the household level.

The following materials were identified as having the highest potential for recovery or recycling due to their inclusion in the Redeem System and established export markets[5]:

PET bottles: Already part of the Redeem System and currently collected and exploited. Relatively clean waste stream with export value.

Aluminum beverage cans: Also currently recycled through the Redeem deposit system. High market value per kilogram and lightweight for export.

Scrap Metal: Collected and exported by private companies, though in smaller quantities than what is landfilled.

5 Updated quantitative data on post-consumer recovery rates is limited. Accordingly, a new waste audit is recommended to validate the ongoing predominance of these materials in the waste stream (see Strategic Priority 1)

Largely unexploited materials with high recycling potential included:

Cardboard and paper: Some local processing occurs, but it is not yet cost-competitive. Export potential exists but low prices and high bulk makes transport costly.

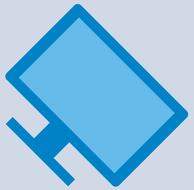
Glass: Limited recycling exists, primarily through Seybrew's glass bottle reuse scheme. Other glass is sent to landfills as it's heavy and costly to export.

HDPE rigid plastics: Not currently separated or recycled at scale, but widely used in packaging and containers. Clean HDPE has established international markets and also makes up a key component for local production of plastic lumber used in benches, bins, construction materials, and other durable products—making it a strong candidate for circular innovation in Seychelles.

Although HDPE and cardboard show potential for circular use, the lack of comprehensive economic feasibility data on collection, processing, and end-use markets in Seychelles warrants further investigation before committing major investment (see Strategic Priority 1).

Materials with potential but facing notable barriers for recycling included:

Organic waste: Represents up to 50% of Seychelles' solid waste stream and has potential for composting and anaerobic digestion which could significantly reduce landfill volume but would need separation at source and upfront investment in infrastructure to process organic waste (COWI A/S & European Union, 2018).



WEEE (Waste Electric and Electronic Equipment): Valuable components (e.g. metals) are recoverable but require safe handling, regulation and economies of scale.

Car batteries: Already collected and exported for recycling, though handling of sulfuric acid is not formally regulated or consistently monitored.

These materials, especially PET bottles, aluminum cans, scrap metal, cardboard/paper, glass bottles, e-waste and used lead-acid batteries are commonly prioritized for recycling in most SIDS, although some regional variations occur. For example, in Pacific SIDS like Samoa, Fiji, and Vanuatu, composting of organics is often a primary focus due to the high proportion of biodegradable waste and strong agricultural reuse potential.

Despite making up a large portion of the waste stream (up to ~50%), composting and anaerobic digestion of organic waste are not widely practiced in the Seychelles. A number of other SIDS (e.g., Mauritius) are expanding plastic recycling to HDPE and even some mixed plastics, especially in light of marine pollution concerns.

3.2. Materials that are not Cost-Effectively Recyclable

The Ellen MacArthur Foundation in collaboration with its Global Commitment signatories encourages the elimination of the following materials as these materials tend to have low recyclability, contaminate other recycling streams, pose hazards to human health or the environment, and are disproportionately costly to collect and process (Ellen MacArthur Foundation & UNEP, 2021):

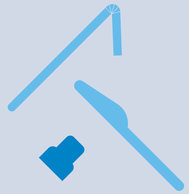
Photo: OceanX

Multi-layer / multi-material films: Used in products like snack bags, sachets, and juice pouches. Difficult or impossible to separate into recyclable components. No viable recycling pathway; typically landfilled or incinerated.

Polystyrene (PS) and Expanded Polystyrene (EPS): Found in foam trays, takeout containers, and packaging fillers. Lightweight but bulky, easily contaminated, and has low recycling value. Rarely accepted in recycling systems and costly to process (Seychelles already bans the import of polystyrene take away containers).

PVC (Polyvinyl Chloride): Used in shrink wraps, some blister packs, and certain bottles. Problematic in recycling streams due to chemical hazards and potential to contaminate other plastics. It contains potentially harmful additives like heat stabilizers (Pb, Zn, and Sn compounds), dioxins, plasticizers (phthalates), and Bisphenol A (BPA). Limited or no market for recycled PVC.

PETG (Glycol-modified PET): Common in shrink sleeves and some rigid containers. Incompatible with standard PET recycling and can degrade the quality of recycled PET. Difficult to detect and separate in MRFs.

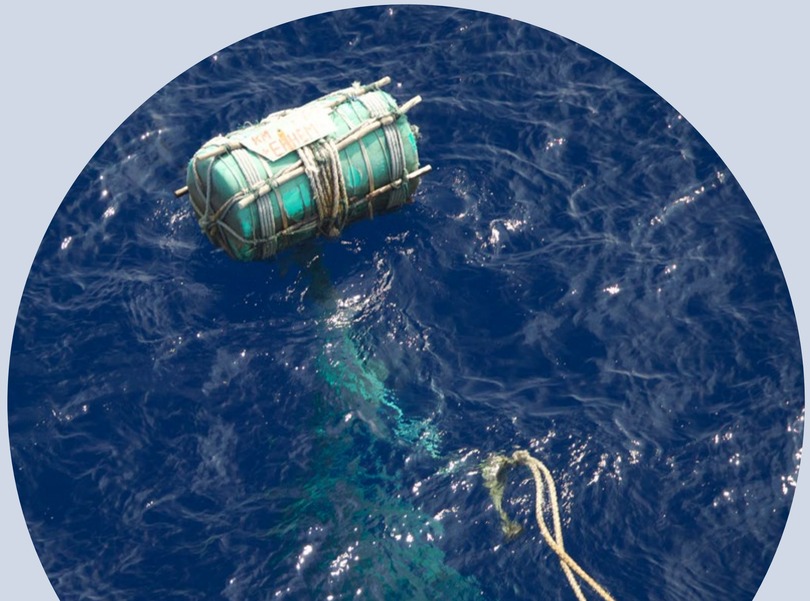


Small-format packaging: Includes straws, cutlery, sachets, tear-off lids, coffee pods, and bottle caps. Too small to be effectively sorted and collected; typically lost in the waste stream or contaminating other recyclables. (Seychelles already bans the import of single use plastic straws, and plastic utensils).

Colored or opaque PET (e.g. black PET): Often used in trays and some bottles. Undetectable by optical sorters and incompatible with clear PET recycling, lowering the value and quality of recycled output.

Flexible plastic films (LDPE, LLDPE): Found in carrier bags, wrappers, and some pouches. While technically recyclable, they are rarely recycled in practice due to high contamination and lack of consistent markets (Seychelles already bans the import of plastic bags, and containers not made of PET/glass).

Photo: OceanX



This categorisation draws on global assessments (e.g. Ellen MacArthur Foundation & UNEP report, 2021), but localized data on the prevalence and specific leakage patterns of these materials in Seychelles is not currently available. A field audit would help confirm whether these global priorities for elimination align with Seychelles' actual marine litter composition (see Strategic Priority 1).

Photo: Shaun Wolfe / Ocean Image Bank

3.3. Materials with the Highest Marine Pollution Risk

Seychelles faces a dual challenge: addressing its local sources of marine pollution (both land- and ocean-based) while also mitigating the impacts of transboundary debris from other countries.

Despite being a relatively small polluter, Seychelles bears a disproportionate burden of plastic accumulation on its beaches and reefs due to its position within major Indian Ocean current systems.

Thanks to high waste collection coverage—particularly for household waste—many of the plastic items commonly found polluting marine environments in other countries are less prevalent in Seychelles. However, some leakage still occurs, primarily from littering, open dumping, overfilled bins in coastal areas, and runoff from landfills during heavy rains, allowing plastics to reach rivers and coastal waters as well as transboundary plastics coming from other nations (e.g., Sri Lanka, India and Indonesia (Vogt-Vincent et al., 2023)).

Land-based sources

Land-based pollution in Seychelles includes leachate leakage from landfills, domestic wastewater, plastics, industrial discharges, pesticides, and agricultural fertilizers (Faye & Konté, 2023).

Leakage from landfills
Significant volumes of leachate and waste escape from Providence I and II landfills on Mahé. Providence I lacks a bottom liner and leachate collection system, and Providence II's treatment plant is nonfunctional. Leachate and untreated waste runoff are reported to flow into the sea daily and into nearby rivers and estuaries, particularly during heavy rain events. These discharges carry plastics, organic pollutants, heavy metals, and pathogens into marine ecosystems, posing threats to coral reefs, mangroves, and seagrass beds (COWI A/S & European Union, 2018, Lai et al., 2016).

Domestic wastewater and sewage
Untreated or poorly treated sewage from urban areas and tourism infrastructure enters marine waters. Coastal water quality issues are particularly noted near urbanized parts of Mahé and Praslin (Faye & Konté, 2023).

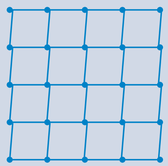
Mismanaged solid waste and plastics
Littering, open dumping, and overfilled bins in public areas—especially near coastlines and tourism hotspots—lead to plastic leakage into waterways and beaches. Small-format plastics, plastic bags, and sachets are the most common types found in local cleanups (Lai et al., 2016).

Agriculture runoff and pesticides
The use of fertilizers and pesticides in coastal agriculture contributes to nutrient and chemical runoff, increasing the risk of algal blooms, eutrophication, and chemical stress on marine habitats (Faye & Konté, 2023).

Industrial discharge
Small-scale industries such as fish processing plants, garages, and workshops discharge untreated or poorly managed effluents, including oils, detergents, metals, and chemicals into drains that discharge into coastal waters (COWI A/S & European Union, 2018).

Ocean-based sources

Ocean-based sources contribute additional threats to Seychelles' marine ecosystems, including ghost fishing gear, microplastics, heavy metals, polycyclic aromatic hydrocarbons (PAHs), and pesticide residues from maritime activities (Marzuki et al., 2022). While the focus is often on landbased pollution, ocean-based pollution is becoming increasingly significant.



Ghost gear and fishing debris
Lost or abandoned nets, lines, and ropes entangle marine animals and damage coral reefs. Ghost gear is widely recognized as one of the most harmful and persistent forms of marine debris in Seychelles (Oceanika team, 2023).

Maritime and vessel waste
Discharges of plastics, oily waste, sewage, and bilge water from vessels—especially near ports and anchorages— contribute to localized marine pollution (Marzuki et al., 2022). Seychelles has acceded to four Annexes of the International Convention for the Prevention of Pollution from Ships (MARPOL 73/78) formalizing their commitment to reducing marine pollution from maritime activities.

Transboundary Marine Debris
While this report focuses primarily on domestic waste streams, transboundary marine debris represents a significant pollution source for Seychelles. Ocean current modeling and field studies (e.g., Vogt-Vincent et al., 2023) show that a considerable share of plastics found on Seychelles' beaches—especially on outer islands like Aldabra—originates from other Indian Ocean nations. Addressing this challenge will require targeted actions, including continued engagement in the UN Global Plastics Treaty, regional collaborations, partnerships, as well national audits to distinguish between transboundary vs. domestic origins to ensure comprehensive composition and source attribution data.

Strategic Priorities for Action

04.

Photo: OceanX

The strategic actions outlined in this section are designed to support and accelerate implementation of Seychelles' key national policy frameworks related to waste, climate, and sustainable development. These include:

- **The Solid Waste Master Plan (2020–2035)**, which outlines infrastructure upgrades, landfill lifespan extension, and diversion of organic waste.
- **The National Circular Economy Framework** which sets measurable targets for waste generation reduction, recycling rates, and landfill diversion.
- **Seychelles' Nationally Determined Contributions** (NDCs) under the Paris Agreement, which commit to reducing methane emissions from waste by 80%.
- **The Seychelles Blue Economy Strategic Policy Framework**, which prioritizes marine ecosystem protection and sustainable resource use.

Each proposed action below is linked to these national plans and contributes directly to achieving SDG 14.1 and broader climate and circular economy goals.

Seychelles faces complex challenges in addressing marine pollution and building a functioning circular economy. However, not all actions are equally urgent or impactful. Based on the material flows, pollution risks, and systemic gaps outlined above, **four priority interventions emerge as critical to prioritize both to protect Seychelles' marine ecosystems and to lay a foundation for long-term circular solutions:**

1. Build knowledge base

Build a robust up-to-date knowledge base with local data to ensure that decisions are efficient and legitimate.

2. Stop landfill leaks

Prevent plastics, toxins, and leachate from polluting rivers and the sea by upgrading landfill containment and treatment systems.

3. Reduce imports of non-recyclables

Ban or phase out hard-to-recycle plastic products like sachets and polystyrene, and promote reusable or recyclable alternatives.

4. Invest in circular infrastructure

Build composting and recycling facilities locally to turn organic waste and key recyclables into valuable local products.

4.1. Foundational Research – Building the Knowledge Base

Circular economy strategies rely on sound data, clear stakeholder roles, and an understanding of economic feasibility.

In the Seychelles context where much of the available data is outdated or anecdotal, and informal practices remain underreported, establishing a robust evidence base is the essential first step. Without this foundation, policy decisions risk being misaligned, inefficient, or lacking legitimacy[6].

Priorities therefore include the following:

National Waste Audit and Material Flow Analysis

- Conduct an updated, nation-wide waste characterization study to determine current waste volumes, composition (by material and sector), seasonal variation, and geographic distribution across islands. This will inform decisions regarding equipment, infrastructure, and potential local markers (Shah et al., 2019).
- Assess material flows to identify leakages, stockpiles, export volumes, and recycling/reuse points.
- Prioritize assessing high-impact categories like organic waste, flexible plastics, PET, and e-waste.

Objective: Provide an empirical basis to prioritize material types for reduction, redesign, or recovery based on volume, pollution risk, and economic feasibility.

6 Data gaps across all material categories remain a core constraint. The most cited waste characterization study was conducted in 2017 and does not reflect seasonal, geographic, or sectoral variations in current waste streams. Moreover, no comprehensive data exist on economic feasibility, leakage rates, or stakeholder roles across different materials. This reinforces the need to begin all strategic interventions with a coordinated national audit and feasibility study.

Economic Feasibility Study

- Assess the full lifecycle cost of recycling different material types within Seychelles, including transportation, infrastructure, and export vs. local processing options (Bennett et al., 2024).
- Evaluate the viability of Extended Producer Responsibility (EPR), levies, green procurement, and market-based incentives.
- Identify opportunities for regional aggregation or innovation (e.g., plastic lumber, compost).
- Consider potential revenue streams from selling recycled products and the cost savings from reduced waste disposal (Ono & Tsusaka, 2023).

Objective: Determine which waste streams can support sustainable business models or public-private partnerships, and where subsidies or grant mechanisms are needed.

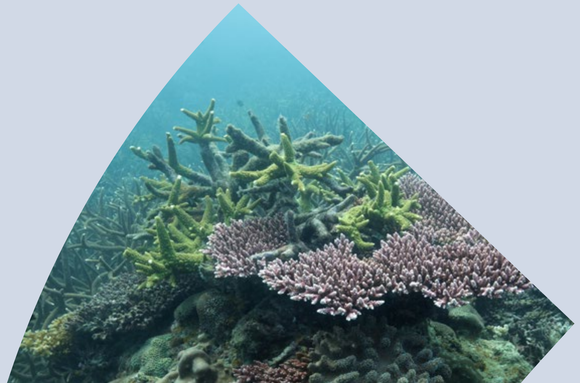


Photo: OceanX

Stakeholder Mapping and Governance Planning

- Identify all public, private, and civil society actors involved in waste generation, collection, processing, regulation, education, and enforcement.
- Clarify mandates, current roles, capacity gaps, and overlapping responsibilities.
- Co-develop a stakeholder engagement strategy to ensure inclusive governance, shared ownership, and capacity building.

Objective: Enable more effective, transparent implementation by clarifying who is responsible for what, where coordination is needed, and where support is lacking.

Photo: OceanX

Financing Strategy for Strategic Priority 1

This foundational action could be supported through World Bank technical assistance, Green Climate Fund readiness support, or regional cooperation under the Indian Ocean Commission or African Circular Economy Alliance. It could be led by the Seychelles Department of the Circular Economy, with inputs from the Landscape and Waste Management Agency (LWMA), MACCE, University of Seychelles, and relevant private sector partners.

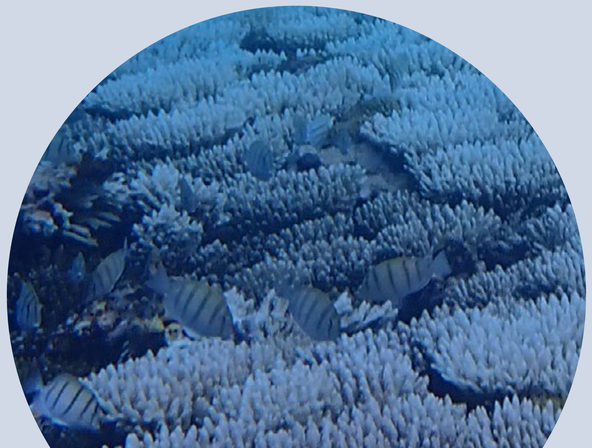
4.2. Stop Ongoing Leaks from Landfills

Seychelles' most immediate and preventable source of marine pollution is the ongoing leakage of untreated leachate from its landfills, especially at Providence I and II on Mahé.

These sites release plastics, organic waste, heavy metals, and pathogens into rivers, estuaries, and coastal waters—posing **serious threats to coral reefs, seagrasses, and public health** (COWI A/S & European Union, 2018). La Digue's landfill also lacks treatment infrastructure, and all landfill sites require upgrades to prevent leachate leakage and reduce environmental risk. Investments are needed to install proper containment systems, repair or replace non-functional leachate treatment plants, and divert organic waste to reduce landfill load (COWI A/S & European Union, 2018). In addition, ongoing, **long-term monitoring of the water bodies around Providence II should be prioritized** to protect local fisheries and safeguard the surrounding natural environment (Meylan et al., 2018).

Photo: Swati Thiyagarajan_Sea Change Project

Photo: Swati Thiyagarajan_Sea Change Project



Policy and Regulatory Actions

To complement infrastructure investments aimed at stopping landfill leakage, Seychelles could consider several policy options to strengthen long-term environmental safeguards and improve landfill management. One option is to **establish national technical standards for landfill design and operation**, requiring features such as bottom liners, leachate collection systems, and stormwater diversion infrastructure. These standards would bring consistency across landfill sites and align with global best practices referenced in the Seychelles Solid Waste Master Plan (COWI A/S & European Union, 2018).

A second option is to **introduce a leachate monitoring and compliance framework**, which could include regular sampling, public reporting, and enforcement mechanisms enabling the Department of Environment to take corrective action if pollution thresholds are exceeded. Seychelles might also consider **mandating the preparation of a national landfill rehabilitation and closure plan**, led by LWMA, to guide upgrades across all islands, including Providence I and II on Mahé, and sites on La Digue and Praslin (Lai et al., 2016).

Photo: OceanX

Financing Strategy for Strategic Priority 2

To address this urgent marine pollution threat,the most effective funding mechanism is a blended approach anchored by the proposed World Bank loan (World Bank, 2024). This concessional financing can support critical infrastructure upgrades, including the repair or replacement of leachate treatment systems, installation of liners and stormwater controls, and closure or expansion of landfill cells as needed.

To complement this, Seychelles can seek grant co-financing from climate and environmental funds such as the Global Environment Facility (GEF) or Green Climate Fund (GCF) tied to the benefits of reducing leachate leakage such as marine pollution reduction and coral protection, climate adaptation benefits, and methane mitigation (linked to organic waste diversion). Such grants could de-risk the World Bank loan, especially for biodiversity and climate-linked outcomes that don't generate direct financial returns. Technical assistance from partners such as the World Bank, UNDP, or the EU could further strengthen project design, safeguards, and long-term landfill planning across all islands.

Over time, Seychelles could also explore performance-based financing mechanisms, such as carbon credit schemes, that reward measurable reductions in pollution or methane emissions.

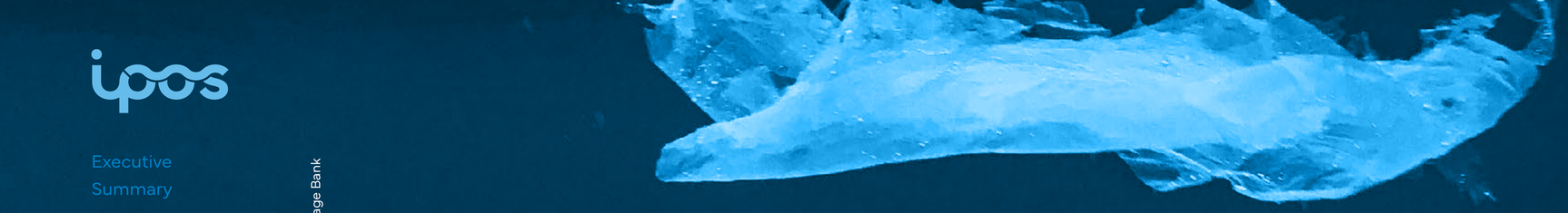


Photo: Naja Bertolt Jensen / Ocean Image Bank

4.3. Reduce Imports of Non-Recyclable Plastics

A third priority is to reduce the volume of plastic waste that cannot be economically recycled and is prone to environmental leakage.

This includes multi-layer sachets, polystyrene, PVC, PETG, and other problematic packaging types (Ellen MacArthur Foundation & UNEP, 2021) and requires a multi-pronged strategy that combines policy reform, market transformation, public awareness, and private sector engagement. Given Seychelles' small scale and dependence on imports, the most effective approach is to focus on **prevention at the source**, supported by **targeted regulation** and **systemic incentives**. Policy measures such as **bans, import restrictions, and incentives for recyclable alternatives** can significantly reduce both local waste volumes and marine pollution risk.

The progressive steps already taken by Seychelles to reduce plastic waste through a series of import bans, including restrictions on non-PET or non-glass beverage containers (2013), plastic bags (2017), plastic utensils and polystyrene takeaway boxes (2017), and single-use plastic straws (2019) (COWI A/S & European Union, 2018; Government of Seychelles, 2016) can be expanded.

Import restrictions can be expanded to other difficult-to-manage products with sustainable alternatives, such as:

Cotton bud sticks

Packets & wrappers

Single-use drinks containers with removable caps/lids

Sanitary items

Bans on known non-recyclable plastic packaging and products—particularly multi-layer sachets and flexible films often used in imported food and personal care items would be effective. This could be done using a phased banning approach like Mauritius, focusing on specific categories over time (Foolmaun et al., 2022) and/or as part of a **regional collaboration** for product standards where Seychelles joins forces with regional blocs (e.g., Indian Ocean Commission, African SIDS) to harmonize import regulations and product standards, develop shared procurement guidelines that exclude non-recyclable plastic types. This approach also leverages collective bulk purchasing power of multiple island States to potentially be able to shift supply chains.

Table 4. **Policy and Regulatory Actions**

Material type	Options to reduce and eliminate
Multi-layer/ multi-material films	**Ban import;** switch to mono-material or reusable formats
Polystyrene (PS/EPS)	**Extend single-use plastic ban** to include all foam containers
PVC	**Ban in packaging;** restrict in imported household products
PETG	**Discourage or ban use;** promote PET alternatives
Small-format packaging	**Ban or redesign;** encourage refill/reuse models
Flexible plastic films (LDPE)	**Discourage use;** promote reusable bags and rigid containers

These policy actions align with ongoing international efforts such as the upcoming UN Global Plastics Treaty, which aims to establish binding global standards for plastic production, design, and management.

Incentivize importers and retailers to promote alternatives combined with Extended Producer Responsibility.

To encourage a shift away from non-recyclable plastics, Seychelles could **introduce tax breaks or import duty reductions** for businesses that choose approved recyclable or reusable packaging alternatives, **making sustainable options more financially attractive**.

In parallel, the government could **establish a "green label" or public recognition program** to celebrate and promote businesses that proactively eliminate problematic plastics from their operations. This dual approach would not only incentivize responsible sourcing but also enhance brand visibility and consumer trust for businesses committed to circular economy practices.

Some countries have tied these actions to an **EPR system for imports where non-recyclable plastics have a higher fee than recyclable, reusable and/or biodegradable packaging** which might have no tax or even an incentive (above). However, successful EPR systems must be implemented with consideration to **ensure fees are not shifted to the end-consumer**. This then encourages companies to design out problematic materials and shift towards recyclables or reusable formats.

Photo: OceanX

Expanding the Levy System to Incentivize Broader Material Recovery.

Building on the success of the existing Redeem levy system for PET bottles and aluminum cans, Seychelles could consider **introducing levies on a wider range of goods**, such as HDPE plastic and additional forms of glass. The current system has effectively encouraged the collection and diversion of these materials from landfills, largely driven by the informal sector. Expanding this model to include additional materials could generate similar environmental benefits by **incentivizing recovery, reducing illegal dumping, and fostering greater participation in recycling across a broader range of packaging types**.

Financing Strategy for Strategic Priority 3

Implementing this transition will require a coordinated funding strategy that blends regulatory reform with catalytic investment. A first step is to establish an EPR system that includes differentiated fees: higher charges for non-recyclable packaging, and reduced or waived fees for recyclable, reusable, or compostable alternatives.

Revenues from this system could generate a sustainable revenue stream earmarked for three primary areas: (1) building institutional capacity to enforce bans and standards, (2) funding awareness campaigns and technical support for businesses, and (3) supporting innovation and local uptake of sustainable alternatives. This includes grants or co-financing to importers or retailers piloting new materials, as well as joint regional procurement to reduce costs and attract suppliers.

To accelerate adoption, the government could also seek climate or circular economy-linked grants (e.g. GEF, Green Climate Fund, or UNEP's Circularity Platform) to fund initial EPR setup, monitoring systems, and incentives for alternatives. Donor funding and blended finance models (e.g. through the World Bank or regional development funds) can further support capital intensive needs, such as testing labs, eco-label certification systems, or centralized procurement for public sector alternatives. Aligning with regional initiatives can also help reduce costs and create shared investment platforms. Combined with strategic use of import tariffs and green public procurement, this financing model would enable a progressive transition towards more circular packaging.

Photo: OceanX

4.4. Unlock Investment for Circular Infrastructure

The fourth strategic priority is to unlock affordable, long-term investment in the core infrastructure needed to support a circular economy—paired with reliable revenue streams from waste operations to ensure financial sustainability and payback over time. In Seychelles and other SIDS, waste infrastructure must be tailored to small, dispersed populations and limited land availability.

Yet current systems remain heavily reliant on basic collection and landfilling, with limited capacity to sort, treat, or recover value from waste streams. Addressing this requires a two-pronged approach: **firstly** securing coordinated investment in systems that can separate organic and non-organic waste in order to reduce pressure on landfills, and **secondly** enabling local value creation from recyclables and compostable materials.

Key priorities include:

- **Source-separation systems and sorting infrastructure** to allow households and businesses to easily separate organic and non-organic waste.
- **Dedicated organic waste treatment infrastructure**, such as composting and anaerobic digestion (AD) facilities, to divert high-volume organic waste from landfills and turn it into useful products like compost and biogas.
- **Recycling logistics and transfer infrastructure**, especially to enable efficient collection from outer islands and aggregation on Mahé.
- **A small-scale materials recovery and processing hub** on Mahé, capable of handling PET and other high-value plastic types, to reduce dependency on export markets and enhance local value retention.
- **Engage with and include Informal Waste Collectors in the community** in planning to strengthen material recovery systems, enhance social inclusion, and ensure the circular economy strategy reflects and supports existing local practices.

Photo: Naja Bertolt Jensen / Ocean Image Bank

4.4.1. Processing organic waste

Seychelles government could explore **enforcing waste diversion targets**, particularly for organic waste, to **reduce pressure on landfill sites and minimize leachate volumes**. Achieving this would require additional investment in system-wide changes, including multi-bin separation at the household level, separate waste collection trucks, and the establishment of composting and/or anaerobic digestion facilities. **This approach aligns with aspirations set out in the Solid Waste Master Plan for Seychelles (2020-2035) and the Circular Economy Roadmap and reflects international guidance from UNEP** on transitioning toward more sustainable waste systems (UNEP et al., 2013).

Developing a circular composting industry presents a significant opportunity for Seychelles to reduce landfill costs, replenish degraded soils, and boost local agricultural productivity. A well-designed composting ecosystem—especially one that valorizes nutrient-rich organic streams like fish processing waste—can **shift waste from being a burden to becoming a valuable input for food security and climate resilience**.

Research from the Republic of Palau illustrates the untapped potential of fish waste: composting just 15% of their fish processing waste could meet 25% of the country's phosphorus needs. A similar approach in Seychelles could **reduce fertilizer imports while fostering a local bioeconomy**. To catalyze this opportunity, a **supportive policy environment is needed**— one that makes composting financially viable, technically sound, and institutionally supported.

Policy and Regulatory Actions

Proposed Policy Measures: The main policy objective is to create conditions for a viable composting market to emerge—where one is not yet economically feasible today. For entrepreneurs and social enterprises to succeed, they need a reliable supply of clean organic feedstock, a guaranteed market for quality compost, and shared responsibility for initial costs and risks. These policy measures are designed to close those critical gaps and enable circular businesses to take root and thrive.

1. Mandate Source Separation of Waste:
Require households, businesses, and institutions to separate organic and non-organic waste at the point of disposal. This ensures cleaner feedstocks, reducing contamination and improving the efficiency and economics of composting operations. Fiji, Mauritius, and Saint Lucia have successfully piloted similar models.

2. Establish Government Offtake and Pricing Guarantees:
To de-risk private investment, the government can guarantee a minimum purchase price for compost that meets defined quality standards. Mandating public institutions (e.g., landscaping, parks, schools, agriculture projects) to source locally produced compost create predictable demand.

3. Enable Public-Private Partnerships (PPPs):
Encourage PPPs by facilitating collaboration between local authorities, NGOs, academics, and private businesses. In Dhaka, Bangladesh, a composting PPP between the city, an NGO (Waste Concern), and a fertilizer company has thrived since 1995. Municipalities can provide land; NGOs can manage the project, and private actors can handle marketing.

4. Introduce Targeted Financial Incentives. Support entrepreneurs through:

- Tax exemptions or reduced import duties on composting equipment.
- Matching grants, concessional loans, or start-up capital, as seen in Jamaica and Vanuatu.

5. Secure Long-Term Access to Land and Facilities:
Provide long-term leases on land, buildings, or transfer stations to composting enterprises. This lowers entry barriers and enables investment. Jamaica's Riverton City pilot demonstrates the success of this approach.

6. Promote Research and Technical Support:
Involve local universities and research centers to provide compost testing, develop nutrient profiles (especially for fish-waste-based compost), and share best practices. This ensures high product quality and confidence for agricultural uptake.

7. Launch Education and Awareness Campaigns:
Public understanding of soil health, organic matter, and compost benefits is vital and should be prioritized to ensure successful policy changes. Government-led campaigns can support adoption of composting practices and increase demand from farmers and landscapers.

Financing strategy for Strategic Priority 4.4.1.
(processing organic waste, reducing landfill pressure)

Achieving meaningful diversion of organic waste from landfills will require a coordinated investment in collection systems, logistics, and treatment infrastructure. While the environmental benefits—particularly reductions in leachate, methane emissions, and marine pollution—are substantial, the financial and operational costs can be significant.

Key investment needs include the introduction of multi-bin systems for household waste collection and businesses, acquisition of separate waste collection trucks to transport organics independently from general waste, and construction of composting and/or anaerobic digestion (AD) facilities. Smaller, decentralized composting facilities may be appropriate for outer islands or rural areas, while a larger central facility on Mahé could serve urban and peri-urban zones.

Photo: OceanX

To fund this transition, Seychelles could combine grant financing for pilot projects and technical assistance with concessional loans for capital infrastructure. The Green Climate Fund (GCF) and Global Environment Facility (GEF) offer suitable mechanisms, particularly when framed around methane reduction, soil restoration, and marine pollution prevention.

Additionally, blended finance models involving donor-backed guarantees or performance-based grants could be used to crowd in private sector participation, especially for compost marketing or AD energy generation. Tourism-linked green fees or eco-levies could also provide a steady domestic funding stream for ongoing operational costs.

Photo: OceanX

4.4.2. Building a Hub-and-Spoke Recycling System

Seychelles could build a Hub-and-Spoke Recycling System - one that enables a consolidated circular economy approach by **enabling efficient collection of recyclables from its multiple islands and transporting them to a central recycling hub on Mahé**. This hub would be designed not just for sorting and baling a more controlled waste stream, but also for locally processing identified high-value materials, such as PET, HDPE, and glass, into products needed in the local economy. These products could range from construction materials and plastic lumber to reusable containers and packaging.

Important policy objectives are to **reduce dependence on exports of pollution/waste, to cut down on illegal dumping and landfill pressure, and to create local jobs and value from waste**. However, achieving this requires overcoming challenges common to SIDS: small volumes, dispersed geography, high logistics costs, and a lack of scale. To make this vision viable, the system must be cost-shared, logistically integrated, and economically incentivized—with a strong enabling environment for both public investment and private enterprise.

Policy and Regulatory Actions

1. Establish a National Recycling Logistics Plan:
Design efficient collection routes using existing transportation infrastructure (e.g., ferries, barges) to minimize costs and environmental impact or acquire or retrofit vessels specifically designed for transporting recyclables, ensuring safe and efficient transfer between islands (Gillespie & Halog, 2022). Consider the archipelago configuration and use scheduled backhaul routes (e.g., return trips on supply boats) to reduce transport costs from outer islands to Mahé.

2. Provide Capital Support for a Central Recycling Hub on Mahé:
Fund or co-finance construction of a central materials recovery facility (MRF) or small-scale recycling innovation center that will do local processing of PET, HDPE, and glass with equipment subsidies, tax incentives, or donor support. Select the location based on accessibility, existing infrastructure and proximity to local markets (Smith et al., 2016).

3. Expand the Existing Levy and Redeem System:
Build on the success of PET and aluminum redemption by expanding deposit-return schemes to HDPE, glass, and other plastics and use these levies to help fund transport and processing infrastructure (Cerezal et al., 2023, COWI A/S & European Union, 2018).

4. Enable Public-Private Partnerships for Processing and Product Development:
Support SMEs or cooperatives to convert recyclables into products for the local economy (e.g. construction blocks, tiles, crates, pallets) offering long-term site leases and secure feedstock access through municipal contracts reducing entrepreneurial risk. Require or incentivize the use of recycled-content materials in public construction and procurement (e.g., road base, benches, bins, aggregates for construction) (Graham, 2024).

5. Invest in Training, R&D, and Technical Assistance:
Collaborate with University of Seychelles and technical colleges to support R&D into material reuse and product innovation.

6. Explore Regional Collaboration:
Investigate joint initiatives with neighboring islands to share transportation resources and maximize economies of scale (Graham, 2024).

Financing strategy for Strategic Priority 4.4.2. (Establishing a Hub-and-Spoke Recycling System)

Establishing a hub-and-spoke recycling system anchored by a central facility on Mahé will require a strategic financing approach that blends public investment with private sector engagement and concessional funding. Given the capital-intensive nature of recycling infrastructure and the small scale of island markets, a PPP model offers a promising pathway.

Under this model, the government would finance and retain ownership of the core infrastructure, while day-to-day operations could be contracted to a private company or social enterprise through a long-term concession. This arrangement enables the State to retain strategic control while leveraging private sector efficiency, technical know-how, and innovation. Similar models have proven effective in other island contexts—for example, the Wisynco-PepsiCo-Jamaican government partnership for PET bottle recycling demonstrates how PPPs can successfully scale resource recovery (Smith et al., 2016).

To attract private participation, Seychelles can offer targeted incentives such as tax exemptions on recycling equipment, matching grants for co-investment, and preferential procurement agreements that commit to sourcing recycled products for public projects (Graham, 2024). Local recyclers, cooperatives, or green SMEs could be invited to co-invest, fostering local ownership and entrepreneurship.

Photo: OceanX

To supplement domestic financing, Seychelles can engage multilateral institutions like the African Development Bank, World Bank PROBLUE Trust Fund, Green Climate Fund (GCF), the Global Environmental Facility (GEF) or UNDP to access concessional loans or blended finance instruments. These institutions are increasingly funding circular economy initiatives that reduce marine pollution and create green jobs. The recycling hub's ability to generate revenue from high-value materials such as PET and aluminum—and to produce downstream products like construction blocks or tiles— strengthens its case for support.

Finally, the country can pursue international grant opportunities such as the Special Climate Change Fund (SCCF) or donor-backed results-based financing models, where funds are disbursed based on waste diversion volumes or employment created (Graham, 2024).

Table 5. **Summary Options for Policy Action**

Priority 1.

Pathways to build Knowledge Base

1. National waste audit & material flow analysis
2. Economic feasibility study
3. Stakeholder mapping & governance planning

Priority 2.

Options for policy actions to stop ongoing leaks from landfills

1. National standards for landfill design and operation
2. Leachate management and compliance framework
3. National Landfill Rehabilitation and Closure Plan led by LMWA

Priority 3.

Options for policy solutions to reduce imports of non-recyclable materials

1. Prevention at source through targeted regulation
2. Incentivise change through systemic incentives
3. Discourage use by expanding import bans and use of import tariffs
4. Support green public procurement

Priority 4.

Options to create enabling conditions for a circular infrastructure:

A. **Organic waste &**

B. **Hub-and-spoke recycling system**

1. Invest in infrastructure
2. Adopt a participatory approach
3. Create enabling conditions through regulation, entrepreneur cost reduction and/or guaranteed sales

Table 6. **Summary Options for Financial Solutions**

Priority 1.

Secure finance from:

1. World Bank
2. Green Climate Fund
3. Regional cooperation in Indian Ocean Commission
4. African Circular Economy Alliance

Priority 2.

Secure finance from:

1. World Bank concessional financing for critical infrastructure upgrades
2. Co-financing with Global Environmental Facility or Green Climate Fund linked to climate adaptation benefits

Technical assistance from:

1. World Bank
2. UN Development Program, European Union
3. Performance based financing mechanisms, for example establishing carbon credits

Priority 3.

Create revenue streams through:

Extended Producer Responsibility (EPR)

Accelerate actions through climate related grants through:

1. Global Environmental Facility
2. Green Climate Fund
3. UN Environment Program Circularity Platform

Priority 4.

A. **Adopt a blended finance with a PPP model**
B. **Foster local ownership through co-investment**

Supplement funding needs with:

1. African Development Bank
2. PROBLUE
3. Green Climate Fund
4. Global Environmental Facility
5. UN Development Program
6. Special Climate Change Fund
7. Tourism linked green levies/eco-levies

Conclusion

05.

Photo: OceanX

This report offers options for how Seychelles can transition from a linear, import-heavy waste system to a more circular economy that reduces marine pollution, recovers valuable materials, and supports local livelihoods. By identifying which materials can and cannot be economically recycled in the SIDS context—and which should be redesigned or phased out—the report presents targeted strategies for waste reduction, recycling and composting, and investment in scalable infrastructure suited to island realities.

The four strategic priorities outlined—(1) building a contextualised and nuanced knowledge base, (2) halting pollution from landfills, (3) reducing imports of non-recyclable plastics, and (4) enabling investment in circular infrastructure - also directly contribute to Sustainable Development Goal (SDG) 14.1, which calls for preventing and significantly reducing marine pollution, particularly from land-based activities, by 2025. These actions also advance progress toward SDGs 11, 12, and 13 by promoting sustainable cities, responsible consumption and production, and climate resilience. Together, they chart a practical path for Seychelles to lead on circular economy innovation in Small Island State contexts.

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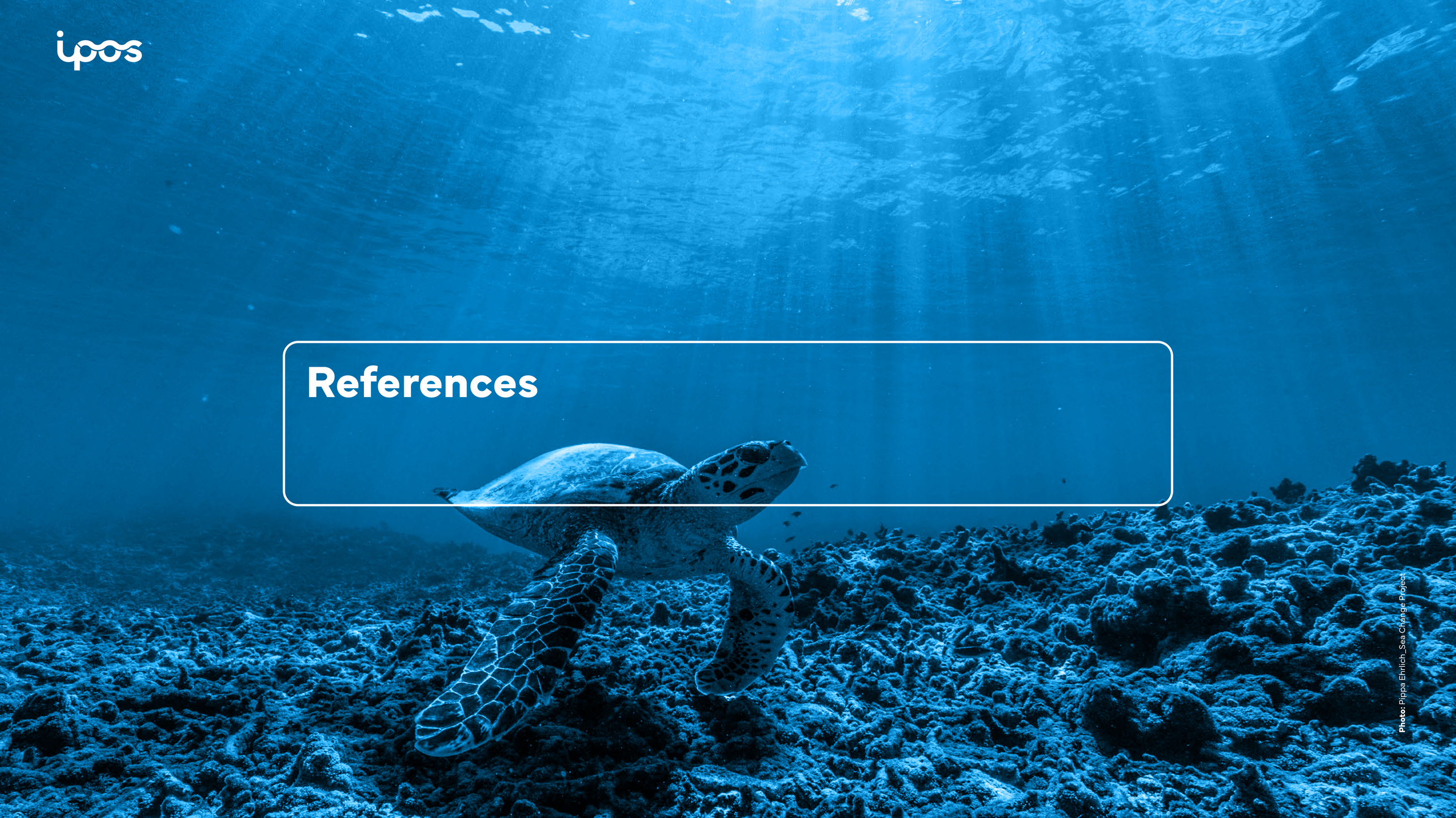

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