

Palau

Status: Archipelago of over 500 islands covers an area of 488 km² with a combined coastline of 1,519km. Palau consists of two main islands, Babeldaob and Koror. The former is the largest island of Palau, comprising 10 of the country's 16 states, and is connected to Koror by way of a bridge. Ngerulmud, is located 20km northeast of Koror and is the nation's capital. Kayangel is a coral atoll lying 45km north of Babeldaob. The islands of Peleliu and Angaur lie approximately 50km to the south of Koror Island. The two smallest islands, Sonsorol and Hatohobei, are between 560km and 640km southwest of Koror. Hundreds of small, uninhabited rock islands lie between Peleliu and Koror Islands.

Population: Palau's population in 2015 was 17,661 (GoP, 2015), including approximately 2,300, or 13%, living in rural locations (Knoema, 2015).

Accessibility: Flights into Palau from Guam and Honolulu

Statistics around Waste (including plastic waste data): Palau is subject to plastics from foreign and local sources and excess plastics are likely to build-up in Palau due to its geography. The land mass is just under 190 square miles, but it boasts over 900 miles of coastline and an Exclusive Economic Zone (EEZ) of over 237,000 square miles. With a coastline almost 5 times of Palau's land mass there is ample room to accumulate marine plastics on its shores. It is also nestled in the same region as the top five countries identified as accountable for 55-60 percent of global plastic leakage into the ocean: China, Indonesia, the Philippines, Thailand, and Vietnam.¹

Recent 2022 (Beraud) study found the concentration of small marine plastics in seawater, sediments and beach sand around a pristine reef area² Based on preliminary marine debris studies in Palau, it is probable that even if plastic production stopped tomorrow, large amounts of plastic would still accumulate on the shores of Palau for years to come.

An estimated 12% of Palau's waste stream consists of plastic. An estimated 2t are mismanaged daily, entering the marine environment through the release from uncontained disposal sites or by direct littering. As a result, an estimated 716t of plastic waste became marine debris in the waters around Palau in 2010. If this is not addressed, the amount is expected to rise to 1,350t per year by 2025. Of the 3.4t of plastic generated each day, approximately 0.372t may derive from PET or high-density polyethylene (HDPE) plastic bottles, eligible for recycling under a container deposit scheme (CDS). Based on an average reduction rate of 40% in mismanaged waste with a CDS in place, approximately 0.09t of PET and HDPE plastic could be recycling each day. This could increase to an 80% or above reduction rate, depending on access to recycling collection services and viable markets, among others. Nonetheless, a 40% reduction in mismanaged PET and HDPE would result in approximately 685t of plastic becoming marine debris each year.

	Coastal population	Waste generation rate [kg/person/day]	% Plastic in waste stream	% Inadequately managed waste	Waste generation [kg/day]	Plastic waste generation [kg/day]	Inadequately managed plastic waste [kg/day]	Plastic waste littered [kg/day]	Mismanaged plastic waste [kg/person/day]	Mismanaged plastic waste in 2010 [tonnes]	Mismanaged plastic waste in 2025 [tonnes]	
Palau	23,446	1.2	12	56	28,135	3,362	1,895	67	0.084	716	1,350	

Source Jambek 2016

¹ Ocean Conservancy 2015. The excessive appearance of plastics in Palau is related to the path of global currents. The North Equatorial Counter Current originates in the tropical Western Pacific around the Philippines, Indonesia, and Papua New Guinea. This current occasionally drifts northward to hit the west coast of Palau and intensify the amount of debris that hits the west coast from the aforementioned nations Heron et al. 2006

² <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0270237>

Palau's solid waste management is well established in Koror. Palau successfully recycles 50 percent of the on island waste.³ Palau benefits from a strong tourism economy and ongoing financial assistance from the United States of America. Approximately 70 per cent of Palau's population resides in Koror, the country's commercial and business centre, resulting in relatively good infrastructure and access to services. Waste collection and segregation is effective with half of plastics being exported for recycling⁴.

As Palau is composed of many islands over a relatively large area given its land mass, the expense to transport waste plastics and marine plastics to a facility off island or to the economic center of Koror is large. This creates a problem in a lack of collection pathway for locally produced waste and in options for disposal and upcycling for collected marine plastics.

	Single Use Plastic Policy	Dedicated Single Use Plastic Orders, Acts and Regulations							Economic Instruments to internalise costs					Recycling	National Campaigns targeting SUP	R&D Alternatives
		Plastic bags	Polystyrene plates	Straws	Styrofoam food Containers	Cups plates cutlery	PET	Plastic Ice blocks pouches nappies	Container Deposit Scheme	Levy Plastic Bags	Duty SUP	ARDC	Single Use Diapers	Recycling Of plastics		
Palau																

Legal Policy Framework *Plastic Bag Use Reduction Act (Title 11) 2018 (SB-1027)* (promoted by President Whipps when he was Senator through observing success of the ban in Yap bans the importation of non-biodegradable or -compostable bags. Retailers prohibited from providing these bags. Both food product and grocery bags are covered under this ban. This act has also legislated a plastics education program into the school curriculum and a public awareness campaign. The Title 11 has been further amended by the *Responsible Tourism Education Act 2018*, requiring tour operators supply tourists with reusable alternatives to disposable plastic or polystyrene cups, bottles, straws and food containers.

Recycling Act 2006 (Nos. 7-24) initiated the CDS and Recycling Fund for the recycling of PET, HDPE, and metal beverage containers (i.e., beer, spirits, wine, tea, coffee, soda, noncarbonated water, non-alcoholic drinks, and plain water).

Economic Instruments: Palau's CDS achievements to date are impressive. This suggests that producer responsibility schemes may also be well supported. The CDS that was established in 2011 successfully recycles glass, plastic, and metal beverage containers achieving an 80% recovery rate. The Koror Redemption Centre, also constructed in 2011, receives redeemable containers from businesses and residents. Cash disbursements are paid for smaller amounts (10,000).⁵ The Redemption Centre is equipped with balers which prepare recyclable materials for sale to the private sector who export to international markets. The redemption centre is also focused on closed loop activities including shredding and composting of organics, cardboard and paper with the potential for biogas technology currently under investigation. Glass containers are crushed and hand blown into new containers and bottles. The glass blowing furnace is fueled by oils derived from pyrolysis of plastics.

A CDS that recovers 40% of HDPE and PET plastic bottles in Palau may achieve the following reductions in marine debris each year: n 5t in floating plastic n 22t in sunken plastic n 5t in beach plastic. Further benefits attributed to a CDS are a potential reduction in annual damage costs for Palau's 77 local fishing vessels (approximately US\$601). If the beaches were cleaned up, over US\$8,040 would be saved, of particular relevance to the amenities of coastal communities and the tourism sector.

³ https://escholarship.org/content/qt4jd2q9dc/qt4jd2q9dc_noSplash_117304a646f1dd4d5000b4f69bf41371.pdf

⁴ http://www.uncrd.or.jp/content/documents/5795Palau_Country%20Report.pdf

⁵ The beverage container recycling program, begun in 2011, imposes a fee of A\$0.10 for each imported beverage container, of which A\$0.05 is returned to the customer as redemption. The national Government receives A\$0.025, as does Koror State Government, to cover administrative costs. There is an import tax in place, and the recycling programme is financed through a dedicated recycling fund that is now sustainable.

Governance and organisation: The Government of Palau consists of executive, legislative (bicameral), and judicial branches. Palau has a central government and 16 states with their own legislature. Each of the 16 states has its own governor and state legislature. Traditional leadership councils operate under national and state laws. They have jurisdiction over traditional cultural law that is not specifically regulated by state and national laws. Solid waste management is the responsibility of the Palauan state and national governments.

The national government is responsible for the landfill and the state is responsible for collection. But there is an inequality in resources and capacity among the states, leaving Koror as the only state that currently has collection. Because Koror is where two-thirds of the population resides, it is the most practical to have the centralized recycling and landfill facility in Koror. Yet the lack of pathways for waste collection outside Koror leave the other 15 states without options for proper disposal.

Koror State Government installed 25 waste segregation stations through a pilot programme in 2007 so that residents and institutions, such as schools, are able to separate waste materials into different bins at the stations. Non-recyclable and non-biodegradable waste is separated as residual for landfill, while paper, aluminium cans, PET bottles, metal, glass and compostable materials are placed in separate bins. Given the success of the program, the number of recycling stations will be increased to a point where waste, in future, will be only collected from the recycling stations rather than from households.

Public Awareness- communities/villagers: Littering, illegal dumping, and the burning of waste is uncommon in the Koror area. There is, however, further need for improvement in the management of solid waste to ensure continued economic growth, particularly with respect to the tourist sector. Generally good knowledge and support for technologies (Adidas initiative that reuses marine plastics to make shoes) or Koror State pyrolysis (i.e. “plastic to bio-fuel”), but lack of awareness about the impacts of plastic and up-cycling in the states outside of the economic center of Koror.

A community clean-up of beaches on Kayangel, Angaur, and Pelilu, located on the far North and South islands of Palau, was conducted by NGOs, community organizations, and government agencies in Palau in March of 2017. In Angaur, the most heavily polluted location, over 5,700 plastic beverage bottles and over 4,600 foam pieces were collected on a small stretch of beach only about 100 meters long. The participants expressed surprise that such a small area could accumulate such significant quantities of debris, often marked with foreign writing. There was a sense of demoralization that although now clean, the beach would re-accumulate debris days, weeks, or months later. Perhaps the hardest of all was leaving the collected trash on the island; there was simply no way to practically transport the collected trash to the recycling facilities on Koror⁶.

Public Awareness- tourism: Tourists are drawn to Palau’s eco-tourism activities because of its pristine natural environment. Tourists to Palau numbered 161,961 in 2015 (RTRC, 2015), representing a 15% increase over the previous year. The rapidly growing number of tourist visitors to Palau has led the Government to adopt the Palau Responsible Tourism Policy Framework, 2017- 2021. The policy targets the development of high value, low impact consumer segments to protect the natural- environment and to ensure a profitable and sustainable tourism sector. Improved recycling systems for tourism operations and public place bin infrastructure is likely to be a key focus moving forward.

Research and Development into Single Use Plastic alternatives/ repurposing:

Palauan resort invested in a small-scale pyrolysis machine to reuse some of the plastics produced by the resort to light its tiki torches at night. Yet, it sits neglected and dusty underneath a sheet in the maintenance area. Before the machine can make fuel from the plastic, the plastic must be shredded. But, lacking the proper shredder the staff must cut plastics with a scissors, by hand - a time and labor-intensive task. The pyrolysis machine also requires the separating of trash to segregate the usable plastics of PP, HDPE, and LDPE, something the resort simply lacks in work plan, capacity, and motivation.

⁶ interviews with Joyce Beouch, Tublai Ililau, Patty Kloulechad, Susan Kloulechad, Madelsar Ngiraingas, and Sengai Sablan, in https://escholarship.org/content/qt4jd2q9dc/qt4jd2q9dc_noSplash_117304a646f1dd4d5000b4f69bf41371.pdf

Development Partner Initiatives: UNEP (2019) spoke of a national marine litter survey to be carried out as the basis for a Marine Litter Action Plan to identify and cost appropriate interventions in consultation with a range of stakeholders including government agencies, non-governmental organizations and the private sector. Need to clarify status of this survey.

Summary Overview

- SWM in Palau advanced relative to other Pacific Islands. Recognised has having good governance in waste management sector CDS scheme in place, pyrolysis machine converting plastic waste to fuel, environmental levies, environmentally conscious public.
- Policy and law bans importation of single use plastics and its use/distribution by government and its agencies. Has efficient container deposit scheme in place. Plastic recycling since 2013 (reverse processing of plastic to oil)(3tonne processed monthly)..
- Marine Litter Survey was to be conducted by UNEP. Good activity to show marine litter from outside sources getting worse to galvanise action in global negotiations to address overproduction and controlling material flows into Pacific wasters.
- Low hanging fruit would be development of Single Use Plastics National Action Plan that Palau does not have.