

**Status**

Poor

Trend

Stable

Data confidence

Medium



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PRESENT STATUS

The Pacific islands region is the least urbanised region in the world, and for the region's vast rural populations sanitation is primarily managed at the household, village, or island level. Central sewerage systems are generally only available in urban centres and therefore less relevant for the majority of Pacific people. According to Anderson et al. (2019 and references therein), the share of Pacific people living in urban settings varies widely from 13% to 100% by country but on average over 81% of the population lives in rural areas, with reduced access to water, sanitation, and hygiene (WASH) services, and the "economic losses associated with the lack of WASH services represent 1.6% of the region's GDP".

Sewage treatment is an environmental issue as well as a human health issue. Ecosystems can help support safe sewage treatment for healthy people, and ecosystems can suffer from poor sewage treatment and disposal.

The 2030 Agenda for Sustainable Development includes a goal (SDG 6) and targets for universal access to safe and affordable drinking-water, adequate and equitable sanitation and hygiene for all, ending open defecation, and reducing the discharge of untreated wastewater to the environment. SDG 6 is widely recognised as an enabling goal, critical to the achievement of many other SDGs. Data provided by Pacific island countries through the WHO/UNICEF Joint Monitoring Programme (JMP¹) estimates that approximately 70% of Pacific islanders live without access to basic sanitation, the highest proportion of any JMP subregion, and that approximately 1.3 million Pacific islanders rely on the bush or the beach for their toilet.

¹ World Health Organization & United Nations Children's Fund (UNICEF) Joint Monitoring Programme (JMP): <https://washdata.org/>

CRITICAL CONNECTIONS

Safe and efficient sewage management provides cross-cutting benefits to people and nature.

Our waste can pollute our water, from our streams and drinking water sources to our lagoons and ocean. Water resource management and sanitation infrastructure are intertwined, especially in islands with a short interface between sanitation and freshwater drinking water supply.

Managing wastewater helps Pacific islands manage their impact on their own water resources. In this effort, nature is on our side. Pacific ecosystems, particularly native forests and wetlands, provide clean fresh water. In contrast, Pacific waterways and fisheries change and, in some cases, suffer due to the excess nutrients and pollutants from wastewater.

The resilience of Pacific wastewater infrastructure to the impacts of climate change and extreme events is a priority. Conversely, safe wastewater management is a component of increasing the resilience of Pacific ecosystems through the protective benefits of reduced pollution and healthier Pacific people.

Used water, both 'grey' and 'black' wastewater, can contain plastics, pharmaceutical residues, heavy metals, and potential endocrine-disrupting chemicals that affect humans and wildlife. The level of impacts of these 'secondary residues' in the Pacific region is unknown.

Tourism relies on clean, healthy environments but places an extra wastewater burden on Pacific islands, especially in fragile nearshore environments. In cases like Muri Lagoon in the Cook Islands, mitigation of wastewater impacts became a national priority to save the lagoon, associated reef fisheries, and tourism.

Sewage management supports the health and dignity of Pacific people, equipping them to live in greater harmony with nature.

TABLE 31.1: Share of the Pacific islands population (%) served by sanitation facility types and sewage treatment, 2017

	SEWER	SEPTIC TANK	IMPROVED LATRINE AND OTHER	SEWAGE TREATED
Total	8.3	14.2	11.7	4.2
Urban	28.3	39.8	11.9	14.5
Rural	2.3	6.5	11.0	1.1

Note that the facility type sewer refers to sewer connections only and does not consider the level of treatment. Of the sewage that was collected and treated, about 88% was treated to primary standards and 65% to secondary standards as of 2013 (the most recent year with data).

Source: JMP washdata.org for households (May 2020); for more information, see *Cleaner Pacific 2025*

Complete and/or recent data are not available for all Pacific island countries and territories (Table 31.1; see Table 13 in SPREP 2016). The Pacific Water and Wastewater Association (PWWA) benchmarking process provides the most accurate and comprehensive regional summary of connections to centralised sewerage systems, with 17 of PWWA's utility members regularly reporting on sewerage system coverage in countries' larger urban areas. The JMP also reports national and regional data on access to various sanitation services, including connections to centralised services.

When considering this indicator, it is important to note that the share of households connected to a central sewerage system does not consider the quality of treatment nor the appropriateness of disposal of the collected wastewater and sewage sludge. For three major considerations—the risk to

human health, the level of nutrients entering the environment, and the management of non-biodegradable wastes such as plastics—the level of treatment and the nature of disposal or reuse of wastewater has significant bearing. Untreated waste bears the greatest risk. Open defecation is practiced widely within the Pacific region, particularly in remote rural communities and atolls with limited freshwater sources. Disease vectors, including those linked to streams, groundwater, and coastal waters, mean that the proportion of people affected by the practice of open defecation is far greater than the share of people actively practicing open defecation.

The regionally endorsed *Cleaner Pacific 2025* strategy (SPREP 2016) did not set a target for wastewater treatment but called for a regional assessment by 2020. Regional strategic frameworks regarding wastewater management are more than ten years old and in need of an update. Wastewater management remains a relatively minor consideration in development support to the region, with only a small number of active projects containing wastewater-management components. In many cases, efforts to support human health and water security (including the protection of potable groundwater) are the primary drivers for better sewage management.

In November 2019, the Pacific Community (SPC) convened a Pacific High-Level Dialogue on Water and Sanitation that identified that more needs to be done to improve the rate, reach, and effectiveness of action to meet the region's commitment to safe and resilient water and sanitation for all by 2030. The Dialogue produced a Call to Action that called on Pacific island governments and partners to commit to prioritise water and sanitation investments and take a range of urgent actions to address the region's persistently low levels of access to safe water and sanitation facilities.

COHERENT REPORTING WITH SDG 6.3

The proportion of households connected to a central sewerage system is only relevant to a relatively small part of the Pacific population and therefore represents only part of the wastewater management picture in the Pacific (SPC 2019). Assessing the fate of all human wastewater, including in rural areas without centralised treatment infrastructure, is arguably more meaningful for the health of Pacific people and environments.

SDG target 6.3 aims to improve water quality by reducing pollution, eliminating dumping and minimising release of hazardous chemicals and materials, halving the proportion of untreated wastewater, and substantially increasing wastewater recycling and safe reuse globally. In supporting this target, SDG indicator 6.3.1 tracks the proportion of wastewater flows from households, services, and industrial premises that is safely treated. SDG 6.3.1 is one of the 132 Headline Indicators selected by the Pacific SDG Taskforce as part of the Pacific Roadmap for Sustainable Development. The indicator refers to the percentage of discharge that is treated in compliance with national or local standards, either for level of treatment, quality of effluent, or impact on receiving waters.

The Pacific is just making a start in reporting on this important indicator, with data for only three countries represented in the latest JMP report (with estimates from Palau, Tuvalu, and Samoa that approximately half of all wastewater is safely treated), and more is needed to support countries to collect and compile the data needed to track progress and inform decision making and investment.

For future State of Environment and Conservation reporting, Pacific countries could consider which of these wastewater indicators best supports their information needs: the Pacific Headline Indicator of SDG 6.3.1 or the present regional indicator of the share of households connected to a central sewerage system.

For more information, see <https://www.sdg6monitoring.org/>. The global custodians of SDG 6.3.1 are WHO, UN Habitat, and UNSD. UN Water has prepared a guidance note with methodology for SDG 6.3.1; see <https://www.unwater.org/publications/progress-on-wastewater-treatment-631/>

PRESSURES AND OPPORTUNITIES

Although sanitation statistics are often managed within the health sector, we focus here on the environment and ecosystem relationships with the management of sewage wastewater, which includes human wastes and non-biodegradable sanitation by-products such as plastic in personal care products and plastic-based hygiene products.

Inadequate management of wastes and activities that contribute to pollution threaten the health of Pacific communities and degrade natural ecosystems, reducing their resilience to climate change. The economic development of many Pacific island countries can also be adversely affected by the impacts of poor waste and pollution management because their economic bases (tourism, fishing, and agriculture) are heavily reliant on healthy environments and because the geological conditions in many islands make freshwater sources vulnerable to pollution.

From an environmental management perspective, there is a desire to assess the receiving environments such as the water quality in areas surrounding wastewater release, treatment, or disposal sites. However, the first step in many locations will be to collect and treat human waste at all, coordinating among the diverse sectors in charge which vary from health to urban planning divisions. A simple, consistently applied standard for the wastewater itself would have flow-on benefits for the receiving environment.

In practical terms, regulating the distance of wastewater sites from streams, drinking groundwater, or coastlines can be a first step in protecting Pacific people and ecosystems. The required distances might vary among areas depending on the local soil and volume of output.

With its high nutrient levels and the potential for high concentration due to centralised collection, wastewater has profound impacts on Pacific environments. Many of the secondary impacts of sewage on Pacific species and

ecosystems are unknown, particularly with regard to new pollutants such as microplastics and pharmaceuticals. Wastewater treatment does not target pharmaceutical pollutants or microplastics, which can build up in sewage sludge and in receiving environments (Murdoch 2015, Ferreira et al. 2020). The levels of pharmaceutical pollution and potential impacts remain nearly unknown in Pacific islands. For information about identifying and monitoring contamination of freshwater and nearshore waters with wastewater, see [Regional Indicator: Freshwater quality](#) and [Regional Indicator: Lagoon water quality](#).

Releasing untreated sewage into waterways or directly to the ocean can harm reefs and associated fisheries (for an example from Papua New Guinea, see Ford et al. 2017). Land-based pollution dominates, although shipping, fisheries vessel, and cruise vessel traffic in the region also brings a sewage burden addressed under the MARPOL Convention's Annex IV.

Sanitation and sewage management must consider all members of society, including the needs of women and girls and the significant role that they play in the management of water, sanitation, and hygiene. Safe and shame-free disposal of single-use hygiene products, such as menstrual products, disposable nappies/diapers, and wipes, is an essential component of sanitation management and the prevention of plastic pollution. Access to sustainable hygiene options combined with support for appropriate disposal according to product type can reduce the maintenance and repair costs of waste-treatment facilities, protect Pacific environments, and maintain the health and dignity of Pacific women, girls, and young children.

Access to sanitary systems and location of sewage treatment must consider the needs of growing Pacific societies and the environment. Rapid urbanisation is putting pressure on governments and utilities to keep up with sanitation needs. People in informal urban settlements are often at greatest risk from unmanaged sewage and simultaneously of causing harm to local environments.

INVESTING IN WASTEWATER MANAGEMENT FOR RESILIENCE

Connection to a centralised sewerage system rarely if ever eliminates the impact of wastewater pollution and in some cases can intensify impacts on the environment. In recognition of these risks, SDG 6.3 also refers to illegal or uncontrolled dumping of wastewater, including uncontrolled discharges and overflows from centralised sewerage systems. In recent years, uncontrolled sewage discharges have impacted coastal waters across the Pacific.

Across the region, the relatively high rainfall intensities experienced in many of our urban centres contribute to frequent and often significant overflows of untreated effluent from centralised sewerage systems to urban streams and coastal waters. In 2015, a broken pipe saw millions of litres of untreated sewage enter Suva's Samabula River and render large areas of the city's coastal waters unsuitable for fishing or swimming for several weeks.

To minimise the risk of future discharges, Fiji is undertaking an Urban Water Supply and Wastewater Management Project designed to augment vital urban infrastructure and services in the Greater Suva Area by increasing water-supply capacity by 26% and wastewater-treatment capacity by 164%. As part of the project, a new 40 mega-litre treatment plant will be constructed in Viria, Rewa by 2025. Blended funding provided by the Asian Development Bank, European Investment Bank, the Green Climate Fund, and local sources made this project possible.

In 2020, sewage wastewater was shown to contribute to microplastic loads in sediments near Suva (Ferreira et al. 2020). Continued support is needed to manage emerging impacts of human wastewater.

Source: Government of Fiji 2019–2020 Budget Estimate, Green Climate Fund Project FP008

Disaster waste management is increasingly essential for changing Pacific islands. Low-lying islands with limited land have reduced capacity to store waste, including untreated sewage. The limited and fragile nature of freshwater resources on many Pacific islands also increases vulnerability to sewage contamination. Reducing the potable water requirements for sewage treatment and reducing the hazards from poorly managed sewage provides financial benefits and greater safety for people and ecosystems, even during disasters.

For central sewerage systems and septic tanks in both urban and rural areas, the safe disposal of the resulting sludge is a priority that can have environmental and economic impacts or benefits depending on how the sludge is managed. Although data on sludge management are limited in the Pacific region, composting and sustainable reuse is not widespread, and in many cases, sludge is either not appropriately collected or is disposed of in a manner that impacts fresh and/or coastal waters. Greater support is required for national agencies to better monitor and report on the management of sludge wastes.

Systematic support for Pacific island countries and territories to manage wastewater would benefit Pacific people and environments. Safe sewage management affects health of people and wildlife not only through the reduced spread of pollutants but also through reductions of disease vectors and enabling conditions.

In 2016, the estimated infrastructure cost to achieve universal adequate sanitation was USD 80 million per year, representing 0.33% of the combined GDP of the Pacific region (WHO 2016).

Pacific leaders have introduced several waste-reducing policies and legislation to curb the import, production, and uncontrolled release of waste (see Regional indicator: [Household waste capture rate](#)). Present in personal care products, plastics including microbeads can be part of the sewage waste stream, and Pacific islands are engaging with plastic and microplastic management (see Regional Indicator: [Marine plastic pollution](#)).

REGIONAL RESPONSE RECOMMENDATIONS

Cleaner Pacific 2025 sets out national and regional recommendations for waste management. Building on these recommendations to address the specific challenges to wastewater management, Pacific islands should:

build comprehensive regional understanding of the status of liquid waste management and receiving water quality in the Pacific region, including a regional collation of existing national wastewater treatment standards;

- implement integrated, cost-effective, technically appropriate, and culturally acceptable practices and technologies that minimise and manage wastewater pollution from various sources (such as domestic sewage, industrial sewage, animal waste, and sludge or landfill leachate);
- develop climate-resilient wastewater infrastructure, particularly that which can cope with the expected increase in frequency and severity of tropical cyclones and associated flooding and landslides;
- develop effective monitoring programmes, including data-sharing among the many sectors involved and the use of monitoring results to inform appropriate interventions;
- develop institutional and human capacity to implement pollution-reduction programmes and monitoring programmes, including support for communities for evidence-based decision-making;
- adopt national policies that reduce pollution from land-based sources;
- raise awareness of the importance of reducing and managing pollution; and
- strengthen partnerships to ensure timely monitoring and progress towards SDG 6.3.1 and the *Pacific Regional Waste and Pollution Management Strategy 2016–2025*.

SANITATION SOLUTIONS APPROPRIATE TO THE PACIFIC

Communities across the Pacific have demonstrated that locally appropriate sanitation solutions can contribute significantly to water savings and to the reduction of pollution impacts on drinking water supply. The implementation of “eco-sanitation”, or composting toilets, in atoll nations such as Tuvalu and Kiribati has demonstrated significant reductions in sewage pollution to groundwater and coastal waters, reduction in the use of fresh water for toilet flushing, and the generation of valuable organic matter on islands devoid of agriculturally productive soils.

Work supported by SPC has demonstrated that households that adopt this innovative waterless solution can eliminate their sewage load to groundwater and reduce their use of fresh water by approximately 30%—equivalent to approximately eight to ten 10,000 litre rainwater tanks per household per year.

Although challenges remain in the wider adoption and acceptance of this approach across the Pacific, the social and design lessons learnt through the application of eco-sanitation in atoll countries such as Tuvalu has enabled the technology to become an important component of atoll nations’ responses to climate change. Through its on-ground experience, Tuvalu is now a source of regional expertise on eco-sanitation and in the Pacific way has been active in sharing its findings with other atoll countries struggling with the pollution impacts and water demand associated with flush toilets.

Source: The Pacific Community (SPC)



New septic tank models built locally to replace aging septic systems in Niue. © P Skelton

INDICATOR IN ACTION

SDGs 6.3.1, 6.2, 6.3, 6.a, 3.9, 12.4 • Basel (Art. 4 obligations 2c) • MARPOL Annex IV • SAMOA Pathway Outcome 58d, 64-65 • Noumea Convention (article 7) • Framework for Resilient Development in the Pacific • Pacific Regional Environment Objectives 2.1, 3.1, 3.2, 3.4 • Pacific Islands Framework for Nature Conservation Objectives 2 & 5

FOR MORE INFORMATION

This indicator was developed with the assistance of the Pacific Community (SPC). For more information about the SPC Water and Sanitation Programme, please see <https://gem.spc.int/key-work/DCRP>

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Indicator 31 of 31 in *State of Environment and Conservation in the Pacific Islands: 2020 Regional Report*



The Secretariat of the Pacific Regional Environment Programme (SPREP) supports 14 countries and 7 territories in the Pacific to better manage the environment. SPREP member countries and members of the Pacific Roundtable on Nature Conservation (PIRT) have contributed valuable input to the production of this indicator. www.sprep.org

National and regional environment datasets supporting the analysis above can be accessed through the Pacific Environment Portal. pacific-data.sprep.org

For protected areas information, please see the Pacific Islands Protected Area Portal. pipap.sprep.org