REGIONAL ENVIRONMENTAL INDICATORS GUIDEBOOK FOR PACIFIC ISLAND COUNTRIES AND TERRITORIES

2025

EUROPEAN UNION

SPREP
Secretariat of the Pacific Regional Environment Programme

Pacific BioScapes

ACP MEAs 3

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OUR VISION: *A resilient Pacific environment sustaining our livelihoods and natural heritage in harmony with our cultures.*

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Manaaki Whenua – Landcare Research New Zealand

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Acronyms

ADB	Asian Development Bank
ABAS	Antigua and Barbuda Agenda for SIDS
BTR	Biennial Transparency Reports
CFC	Chlorofluorocarbons
CITES	Convention on International Trade in Endangered Species
DPSIR	Drivers, Pressures, State, Impact and Response
EBA	Ecosystems-Based Adaptation
EBM	Ecosystem-Based Mitigation
EEZ	Exclusive Economic Zone
ENSO	El Niño-Southern Oscillation
EPA	Environmental Protection Authority
FAO	Food and Agriculture Organization of the United Nations
FFA	Pacific Islands Forum Fisheries Agency
GHG	Greenhouse Gases
HCFC	Hydrochlorofluorocarbons
HFC	Hydrofluorocarbons
IRENA	International Renewable Energy Agency
IRT	Indicator Reporting Tool
ITCZ	Inter-Tropical Convergence Zone
IUCN	International Union for Conservation of Nature
JICA	Japan International Cooperation Agency
KPI	Key Performance Indicator
MEA	Multilateral Environmental Agreement
MPA	Marine Protected Areas
NDC	Nationally Determined Contributions
NEMS	NEMS National Environment Management Strategy
NIR	National Inventory Reports
NGO	Non-Government Organisation
ODS	Ozone Depleting Substances
OECM	Other Effective Area-based Conservation Measures
PAME	Protected Area Management Effectiveness Assessments
Samoa Pathway	SIDS Accelerated Modalities of Action Pathway
SDG	Sustainable Development Goals
SOE	State of Environment
SOEC	State of the Environment and Conservation
SPC	The Pacific Community
SPCZ	South Pacific Convergence Zone
SPREP	Secretariat of the Pacific Regional Environment Programme
UNCCD	United Nations Convention to Combat Desertification
UNEP	United Nations Environment Programme
UNESCAP	United Nations Economic and Social Commission for Asia and the Pacific
UNFCCC	United Nations Framework Convention on Climate Change
WCPFC	Western and Central Pacific Fisheries Commission
WHO	World Health Organization

FOREWORD

It gives me great pleasure to present this second edition of the Regional Environmental Indicators Guidebook, a valuable resource designed to strengthen SPREP Members collective capacity to guide, monitor, assess and report on the state of our Pacific environment.

The Pacific region is home to unique ecosystems and rich biodiversity that are central to our identity, culture and livelihoods. As our island nations continue to navigate the growing challenges of climate change, pollution and unsustainable resource use, the need for accurate, reliable and comparable environmental data has never been greater. Indicators play a vital role in transforming this data into actionable knowledge helping policymakers, communities and regional partners make informed decisions that safeguard our shared environment for generations to come.

This 2025 edition builds on the 2021 version, reflecting progress made, greater alignment with relevant regional and international multilateral frameworks and lessons learned in strengthening the region's environmental data and indicator frameworks. It provides a practical guide for the development, selection and use of environmental indicators across six key thematic areas. Altogether, this guide includes 34 indicators currently in use and introduces 10 proposed indicators for future consideration by our Members.

I would like to acknowledge the contributions of our Member countries and territories, development partners and the dedicated SPREP team who have worked together to produce this Guidebook. It is through such collaboration that we continue to strengthen our regional environmental data ecosystem; one that empowers evidence-based action and amplifies the Pacific voice in global fora.

May this resource serve as a practical tool and a source of inspiration as we continue to work together for a resilient and sustainable Pacific environment.

Sefanaia Nawadra
Director General
SPREP

OVERVIEW

This guidebook introduces environmental indicators put together by SPREP in consultation with SPREP member Countries and Partners to guide Pacific island countries. In 2012, SPREP members approved the development of a set of standardised indicators for use by member countries. Through the Inform project, 29 indicators were endorsed by members at the first Executive Board Meeting in 2018. A Guidebook developed in 2021 included additional indicators that were regionally important (a total of 34 core indicators). A revision of the Guidebook was funded through the Pacific Biodiversity and Sustainable Land-Seascapes (Pacific BioScapes) Programme in 2025. This involved realignment of the core indicators with Multilateral Environmental Agreements (MEAs), regional strategies and frameworks, as well as the identification of new indicators for both regional and national reporting commitments. The 2025 review consisted of stakeholder validation meetings which revised 34 core indicators and proposed 10 new indicators for future endorsement. This document explains the development and use of environmental indicators in Part 1 and provides a summary of each of the 34 core indicators in Part 2, with explicit links to targets and indicators identified in the multilateral environmental agreements and regional strategies and frameworks. Part 3 outlines the 10 new indicators proposed for future consideration by SPREP members.

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PART 1 Environmental Indicators

What are environmental indicators?

Environmental indicators are measurements that provide insight into a matter of larger environmental significance. A frequently cited example from meteorology is rapidly dropping air pressure, which can indicate an approaching storm or weather front. The measurement of air pressure itself is of little importance, but a storm could be a significant event that impacts people in various ways. A good example of an indicator for health is the universal measurement of body temperature. High body temperatures indicate an underlying infection that may require medical intervention. In a similar way, environmental indicators can tell us whether we need to act to improve environmental health.

Why use environmental indicators?

Indicators have two important defining characteristics that make them useful for environmental decision makers. First, they quantify information so that its significance is readily apparent and trends can be determined over time. By being measurable, indicators can remove the human bias or subjectivity component in environmental decision making. By showing trends over time, indicators help decision makers understand where they need to direct funding or policy, and whether policy is having the desired impact in maintaining or improving environmental health. All indicators are an empirical model of reality and thus their value relies on them being analytically sound through the use of a fixed methodology of measurement.

Second, indicators simplify complex phenomena which assists in communicating messages to decision makers and the public. For example, anthropogenic global warming is an immensely complex phenomenon with many components, but a simple chart showing mean temperatures over time demonstrates that the Earth is rapidly getting hotter and that this issue must be urgently addressed through mitigation. The efficient use of indicators attempts to strike a balance between understanding complex phenomena (monitoring) and implementing policy (management). Investing too much time and funding in monitoring (i.e. trying to measure too many things) can take resources from the policy and management components. Conversely, investing too little in the monitoring component means that decision makers will lack sufficient data on whether policy is resulting in its intended outcomes.

Indicators and State of Environment reporting

In Pacific island countries and across the world, indicators are used in the State of Environment (SoE) reports and are aligned with targets and goals of multilateral environmental agreements and other regional frameworks and strategies. SoEs are a comprehensive national assessment that provides a status of the health of the environment and recommendations for where resources should be directed to address issues identified through the development of National Environmental Management Strategies (NEMS) and other action plans. In the past, SoEs relied heavily on expert opinion and other qualitative data. As a result, SoEs were mostly descriptive and were unable to objectively demonstrate environmental trends over time. Pacific island countries have now adopted quantitative SoEs based on the 'Drivers, Pressures, State, Impact, Response' (DPSIR) model (Figure 1). The DPSIR model is an internationally accepted approach for reporting on the environment. Drivers are higher-level factors that indirectly affect the environment (e.g. population growth). These drivers exert pressures that directly impact the environment (e.g. forestry), which may result in observable changes in the state, as measured through environmental indicators. Any changes in the state of the environment will affect communities, economies, and ecosystems. By understanding how the drivers impact systems, informed responses can be applied to manage the various factors in this process. The links between processes in the DPSIR model are not always simple cause-and-effect relationships, and frequently involve complex interactions including cumulative and historical effects.

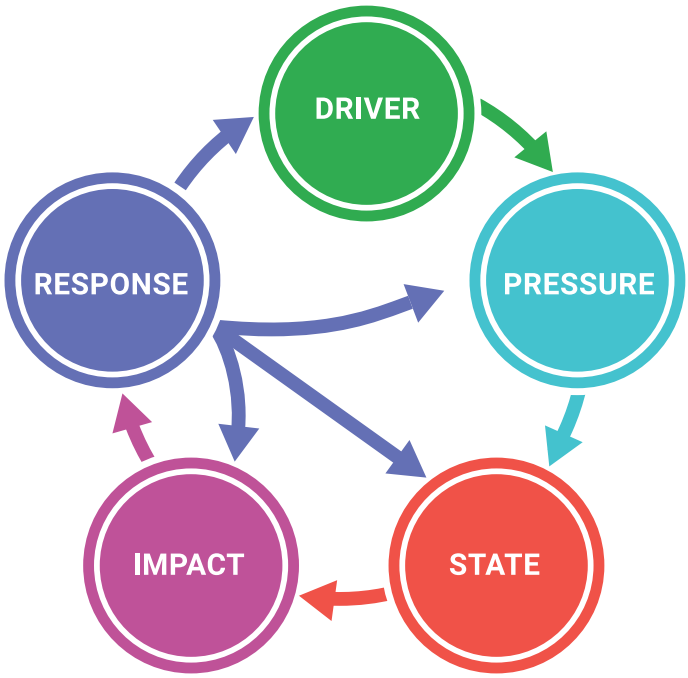


FIGURE 1. Drivers, Pressures, State, Impact and Response (DPSIR) model used for assessing the state of the environment.

Key indicator components

There are several key components that make an effective environmental indicator:

Definition
What is being measured over time?

Key Terms
What is the meaning of some of the words used in the indicator?

Purpose
What does this indicator tell us more broadly about environmental health?

Desired Outcome
What is the desired trend in the indicator towards good or improved environmental health? Is there a specific number being targeted? For example, 20% of total land area is under protection.

Assumptions
What programmes need to be in place to collect indicator data and are there factors that may affect the usefulness of the indicator?

Calculation
How is the indicator measured?

Data Sources
Where can data or the derived metrics be found in order to report on the indicator?

Data Collection
How should data be obtained, acquired, or collected in order to efficiently report on the indicator?

Frequency of Data Collection
How often should the indicator measurement be monitored or collected?

Disaggregation
How should data be disaggregated (separated into smaller parts) in order to better understand the state and trend?

Best Practices
What are things to consider when interpreting the data in order to maximise the information gained?

Linkages to MEAs and other frameworks and strategies
What targets and indicators of other MEAs, frameworks, and strategies does this indicator align with?

Indicator symbols

SPREP has developed infographics as visual aids to help communicate the main assessment components for each indicator. Assessment symbols summarise the 'State' of each indicator in an easily interpretable manner (Figure 2). These symbols establish baselines to compare the state of each indicator for future assessments, including SoE reports. The symbol includes ratings for 'Status', 'Trend' and 'Confidence'. Table 1 provides a guide to interpret the symbols and explains how the symbols were derived.

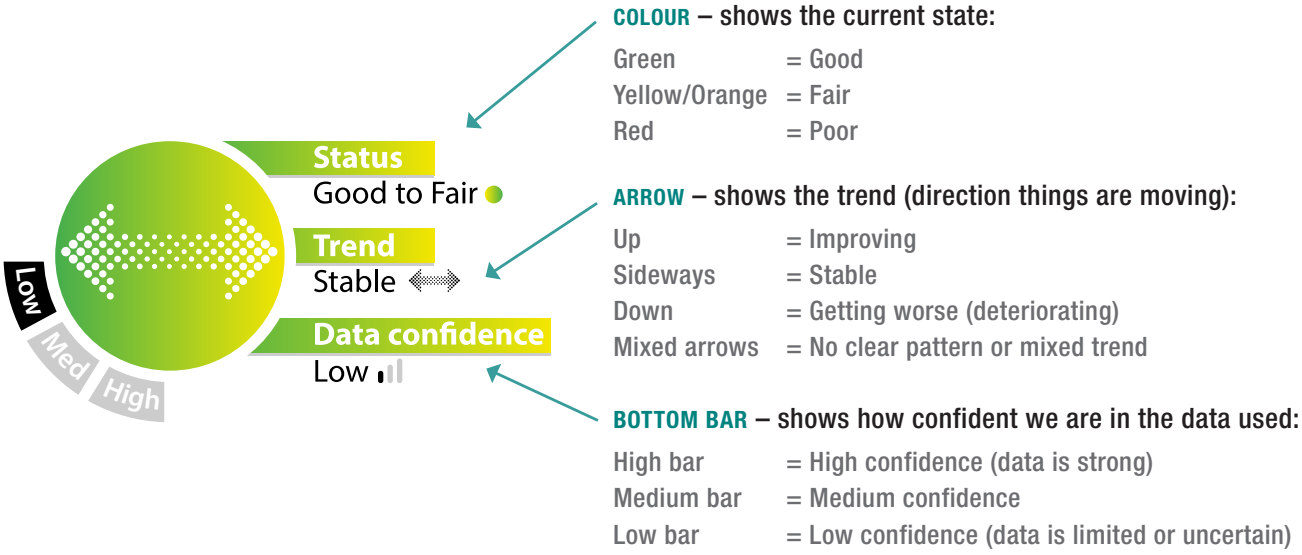
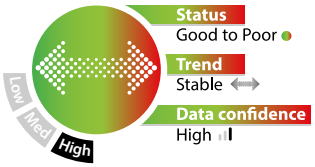
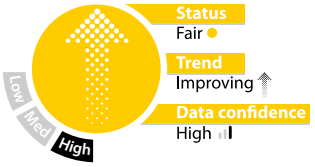
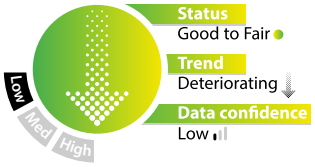
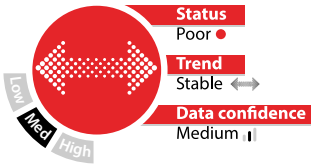
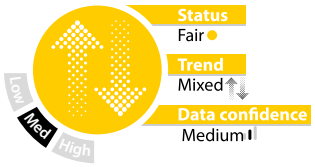
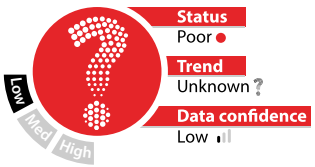
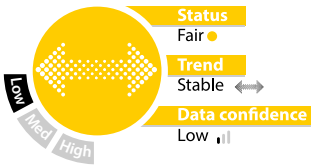


FIGURE 2. Explanation of the Indicator symbol.

TABLE 1. Guide to interpreting the indicator symbols

	CATEGORY	DESCRIPTION	HOW IS IT DERIVED?	SYMBOL EXAMPLE
STATE (CAN BE A RANGE)	GOOD FAIR POOR	The level to which the indicator meets or exceeds (good), is close to meeting (fair) or is well below (poor) a given standard for healthy ecosystems, habitats, species, airsheds, watersheds or an urban environment.	Assessment is based on 1) recent trends, 2) comparison with similar jurisdictions, and 3) comparison with 'healthy' habitats and systems. Where limited data exists to make an assessment based on these criteria, expert opinion is used.	
TREND	IMPROVING	The state of the environment related to this indicator is getting better.	Trends show a significant increase, or based on weight of evidence that indicators are improving.	
	DETERIORATING	The state of the environment related to this indicator is getting worse.	Trends show a significant decrease, or based on weight of evidence that indicators are worsening.	
	STABLE	The state of the environment related to this indicator shows there is no detectable change.	Trends show no significant increase or decrease, or, based on weight of evidence that indicators are stable.	
	MIXED	The state of the environment related to this indicator shows a mixed trend: sometimes the state is getting better, worse, or there is no change.	Used primarily for sub-topics with multiple indicators, or in cases where data shows two distinct trends.	
	UNDETERMINED	Not enough data exists to determine trend.	Insufficient data available to generate trend.	
CONFIDENCE	HIGH	Data is of high quality and provides good spatial and temporal representation.	Trusted and comprehensive time series and/ or national level data sources are used to determine confidence trend.	
	MEDIUM	Data is either lower quality, geographically sparse or limited temporally.	Data is derived from many sources, and is not always consistent, with some extrapolation necessary.	
	LOW	Data does not meet any of the above criteria.	Data is very coarse and outdated, and limited to single country sites.	

Reusing Indicators

A key side benefit of maintaining up-to-date indicators is reducing the reporting burden for Pacific island countries. All Pacific island countries have numerous national, regional, and international reporting obligations (including MEAs and SDGs) which can become a significant burden on staff resources (Figure 3). If updated regularly (e.g. annually), environmental indicators developed for SoEs can be reused for other obligations with minimal additional work, thus reducing the reporting burden on the stakeholder. To assist in the reusability of environmental indicators, SPREP has developed the Indicator Reporting Tool (IRT), an online application for developing and updating indicators and producing reports. To find out more about the IRT, visit https://indicators.sprep.org.

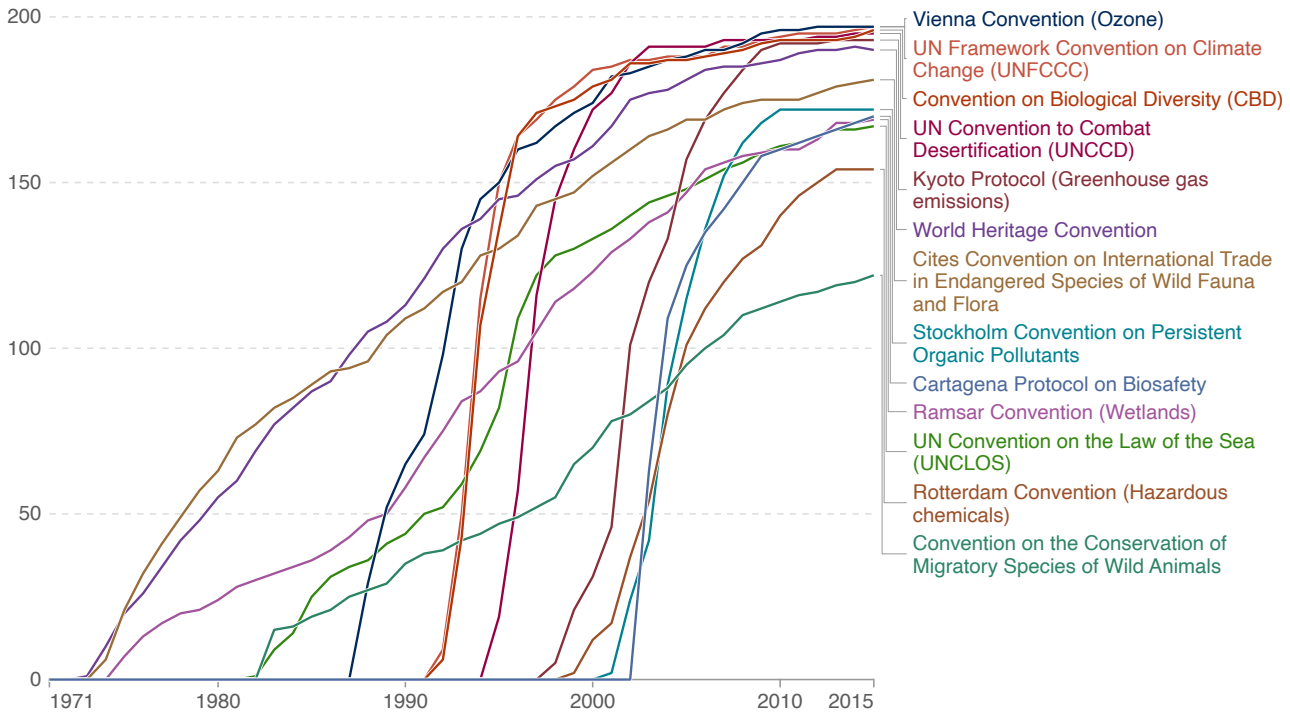


FIGURE 3. The rise in ratifications of Multilateral Environment Agreements.
Source: Total number of global parties signed on to multilateral environmental agreements designed to address trans-boundary environmental issues, United Nations Trade and Development, processed by Our World in Data.

PART 2 Core Indicators

The 34 core indicators were updated in 2025 through the Pacific Biodiversity and Sustainable Land-Seascapes (Pacific BioScapes) Programme. This included a comprehensive review of MEAs, global frameworks, and regional strategies and frameworks in order to incorporate new reporting requirements and objectives into the previous set of indicators (Table 2). The 34 updated indicators are in six broad themes: Atmosphere and Climate, Biodiversity, Built Environment, Environmental Governance, Land, and Coastal and Marine. These are used by Pacific island countries to group indicators in their national SoE reports and with the grouping of datasets on the national environment data portals. All the indicators are quantitative and include metadata to describe the definition, key terms, purpose, desired outcome, assumptions, calculation, data sources, methods and frequency of data collection, suggestions for disaggregation, best practices, and explicit links to MEAs and global and regional frameworks. Example charts and figures, based on hypothetical data, are also displayed for each indicator and show improving, stable, or deteriorating trends in the data. Some indicators are very simple and can be sourced from standard government reports (e.g. Environment Ministry budget allocation) whereas others require environmental sampling across numerous monitoring sites to produce meaningful measures with some level of precision (e.g. live coral cover). If you need to design a robust monitoring programme, please contact SPREP.

TABLE 2. List of multilateral environmental agreements (MEAs) and global and regional frameworks or strategies that were reviewed for updating the Regional Environmental Indicators.

RESOURCE	TYPE
2050 Strategy for the Blue Pacific Continent	Regional
Antigua and Barbuda Agenda for Small Island Developing States: A Renewed Declaration for Resilient Prosperity (ABAS)	MEA
Basel, Rotterdam, and Stockholm Conventions	MEA
Cleaner Pacific 2025 Strategy	Regional
Convention on Biological Diversity	MEA
Convention on the Conservation of Migratory Species of Wild Animals	MEA
Convention on the International Trade of Endangered Species	MEA
Convention on the International Trade of Endangered Species Strategic Vision: 2021–2030	MEA
Coral Triangle Initiative	Regional
Framework for Energy Security and Resilience in the Pacific	Regional
Framework for Pacific Oceanscape	Regional
Framework for Resilient Development in the Pacific	Regional
Framework for the Development of Environment Statistics	Global
Global Chemical Framework	Global
Global Set of Climate Change Statistics and Indicators	Global
Growing the Pacific: 2050 Strategy Pacific Agriculture and Forestry: Healthy, Regenerative, Secure	Regional
International Coral Reef Initiative	Global
International Plant Protection Convention	MEA
International Treaty on Plant Genetic Resources for Food and Agriculture	MEA
Kunming-Montreal Global Biodiversity Framework	MEA
London Convention on Prevention of Marine Pollution by Dumping	MEA
MARPOL – International Convention for the Prevention of Pollution from Ships	MEA
Memorandum of Understanding on the Conservation of Migratory Shark	MEA
Micronesia Challenge 2030	Subregional
Montreal Protocol – Kigali Amendment	MEA
National Biodiversity Strategies and Action Plans (NBSAPs)	National
Noumea Convention	Regional
Pacific Bioscapes Logframe	Regional
Pacific Coral Reef Action Plan (PCRAP) 2021–2030	Regional
Pacific Islands Framework for Nature Conservation and Protected Areas 2021–2025	Regional
Pacific Islands Regional Marine Species Programme (PIRMSP) 2022–2026	Regional
Pacific Platform for Action for Gender Equality and Women's Human Rights 2018–2030	Regional
Paris Agreement	MEA
Ramsar Convention on Wetlands	MEA
Revitalised Pacific Leaders Gender Equality Declaration	Regional
Regional Waste Data Collection, Monitoring and Reporting Framework	Regional
Samarkand Strategic Plan for Migratory Species 2024–2032	MEA
Sendai Framework for Disaster Risk Reduction 2015–2030	Global
SIDS-4 Conference Outcomes/Samoa Pathway	MEA
SPREP Guiding Framework for Invasive Species Management	Regional
SPREP Strategic Plan 2017–2026	Regional
Sustainable Development Goals	Global
The UNCCD 2018–2030 Strategic Framework	MEA
UAE Framework for Global Climate Resilience	MEA
UN BBNJ Treaty – Agreement on Marine Biodiversity of Areas beyond National Jurisdiction	MEA
United Nations Framework Convention on Climate Change	MEA
Vienna Convention for the Protection of the Ozone Layer	MEA
Waigani Convention	Regional

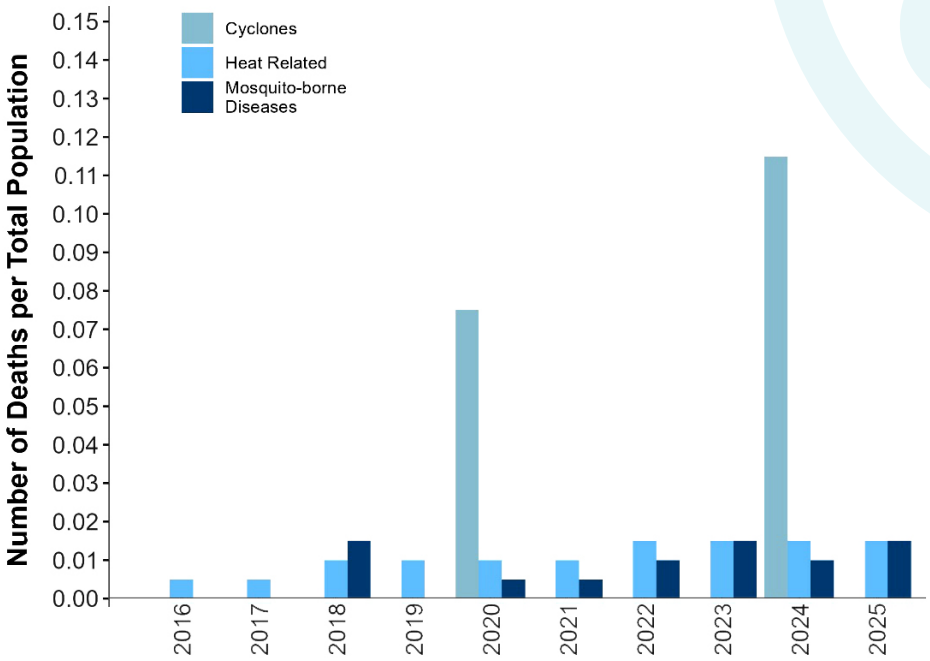
Atmosphere and Climate

Climate change and its impacts are a leading threat to Pacific island ecosystems, species, and people. The theme of **Atmosphere and Climate** presents a total of eight indicators that are focused on climate change resilience, adaptation, and mitigation:

- Climate Related Deaths
- Climate Related Disaster Losses
- Climate-based Adaptation and Mitigation Funding
- Funding for Ecosystem-based Adaptation and Mitigation
- Greenhouse Gas (GHG) Emissions
- Ozone Depleting Substances
- Pacific Climate Change Preparedness Scorecard
- Renewable Energy

INDICATOR

Climate Related Deaths



Number of climate-related deaths from 2016–2025 [Hypothetical data for illustrative purposes only.]

Indicator Definition

Number of annual climate-related deaths per total population from declared disasters, diseases, and other extreme weather events.

Key Terms

Climate-related deaths: loss of life attributable to heatwaves, wildfires, floods, tropical storms, typhoons/hurricanes, disease vectors, or disruption of food availability associated with climate change.

Purpose

Climate change is resulting in more extreme weather events globally, changes in temperatures and sea level rise, and shifts in vectors spreading diseases. The Pacific islands are particularly vulnerable to cyclones and storm surges. This indicator assesses how well adaptation and disaster preparedness and response measures protect the population against these extreme events by reducing impacts.

Desired Outcome

No deaths associated with extreme weather events and diseases associated with climate change.

Assumptions

Assumes these data are being collected by relevant government authorities and NGOs. There is an assumption that loss of life is clearly attributable to climate change, whereas loss of life may be related to multiple complications or factors.

Calculation

Annual sum of climate-related deaths per total population size.

$\sum$ (climate related deaths) = **the sum of the climate related deaths.**

population size = **the population size of the country.**

Hypothetical Example of Calculation

A country with a population size of 50,000 people experiences a typhoon and flood event during the year. There are 10 deaths associated with the typhoon and 5 deaths associated with the flooding event. Therefore, this indicator would be calculated as 15 deaths / 50,000 people = 0.0003.

Data Sources

Government ministries responsible for health and disaster response, NGOs. Lancet Countdown (https://lancetcountdown.org/explore-our-data/), census data, World Meteorological Organization – Atlas of Mortality and Economic Losses from Weather, Climate and Water-related Hazards.

Data Collection

Number of fatalities are totalled following extreme weather events, disasters, or disease outbreaks.

Frequency of Data Collection

Annually.

Data Disaggregation

Data can be disaggregated by cause to better prioritise actions for mitigation and prevention. Examples include disaster type, mosquito-borne diseases, and heat related deaths.

Best Practices

Discussion should be focused on how adaptation and disaster preparedness and response measures (early warning systems, education and awareness about general safety and evacuation procedures and routes, avoidance of development in high-risk areas) can decrease loss of life. Some deaths may be difficult to attribute to climate related events, such as mosquito-borne illnesses or heat related deaths. Other factors such as temperature and precipitation data may be needed in order to correlate the metric with potential causes. In particular, the effects of climate phenomenon such as the El Niño-Southern Oscillation (ENSO), Intertropical Convergence Zone (ITCZ), and South Pacific Convergence Zone (SPCZ) should be taken into consideration when analysing trends over time.

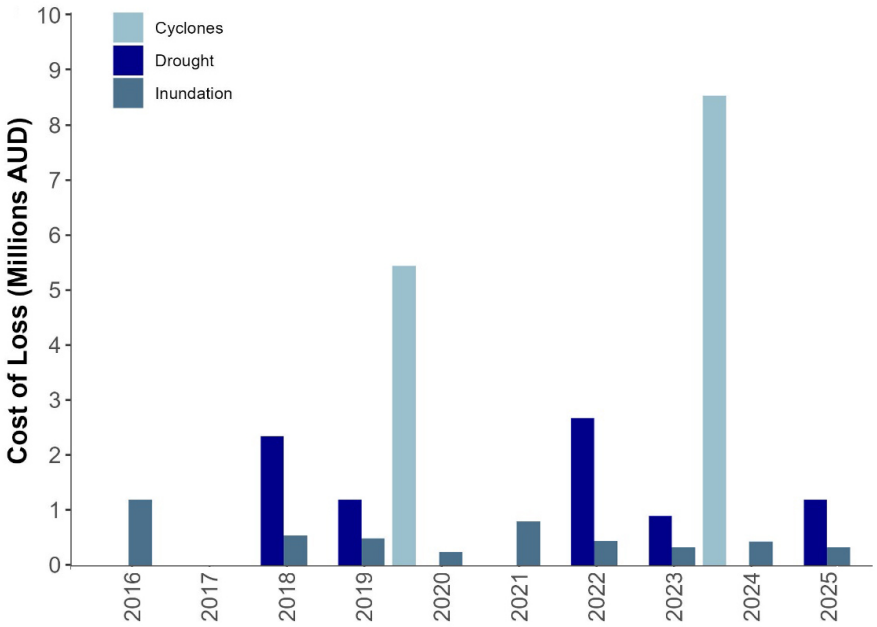
In addition, there can be compounding effects of cumulative events which increases exposure and vulnerability of communities that can increase the likelihood of loss of life from events. The cumulative impacts should also be addressed during discussion of this indicator. Reporting requirements are typically standardised to loss of life per 100,000 people. However, several Pacific island countries have populations less than 100,000 people and the calculation for this indicator uses population size as the denominator. A conversion may be needed to convert between the two metrics if ministries and national statistical offices are reporting loss of life per 100,000 people (multiply this indicator metric by 100,000/total population size).

Linkages to MEA and other frameworks and strategies

- → 2050 Strategy for the Blue Pacific Continent – Climate Change and Disasters
- → Framework for the Development of Environment Statistics 4.1.2, 5.2.3, 5.2.4
- → Global Set of Climate Change Statistics and Indicators 42
- → SDG 11.b, 13.1
- → SAMOA Pathway/ABAS – 51, 52
- → Sendai Framework for Disaster Risk Reduction
- → SPREP Strategic Plan 2017–2026 Regional Objectives 1.2, 1.5
- → United Nations Framework Convention on Climate Change (UNFCCC)

INDICATOR

Climate Related Disaster Losses



Cost of Climate Related Losses from 2016–2025 [Hypothetical data for illustrative purposes only.]

Indicator Definition

Total cost of economic loss resulting from climate-related disasters and events (cyclones, floods, landslides, drought, sea level rise).

Key Terms

Economic loss: damage to buildings and other economic assets, number of transportation networks affected, economic disruption or loss of revenue to commercial services, and utility disruption.

Purpose

Climate change is resulting in more extreme weather events globally and the Pacific islands are particularly vulnerable to cyclones, droughts, and sea level rise. This indicator assesses how well adaptation and disaster preparedness and response measures protect the population against these extreme events by reducing impacts and losses.

Desired Outcome

Negative trend in economic losses associated with disasters and climate change-related events.

Assumptions

Assumes financial impacts associated with disasters and climate change-related events are accurately costed. Loss of life and loss of ecosystem services can be difficult to quantify in financial terms which can make accounting for this indicator difficult. This indicator also does not directly account for non-financial/economic losses that are a critical component of environmental and human health, such as social and cultural losses.

Calculation

Cost of climate-related losses in inflation adjusted currency are summed on an annual basis.

$$\sum \text{(cost of climate related losses)} = \textbf{the sum of economic losses attributable to climate related disasters and events.}$$

Hypothetical Example of Calculation

A country experiences a typhoon and flood event during the year. The damage to infrastructure from the typhoon is valued at AUD 10 million, while the flooding event resulted in damage to crops valued at AUD 2 million. Therefore, the indicator would involve adding the two economic losses together and be calculated as AUD 12 million.

Data Sources

Government finance, disaster response/management, and meteorological ministries; national statistics offices; post disaster needs assessment reports; NGOs; SPC Household surveys; and World Meteorological Organization – Atlas of Mortality and Economic Losses from Weather, Climate and Water-related Hazards.

Data Collection

Data are collected and available through household surveys and summarised by natural disaster response ministries and agencies.

Frequency of Data Collection

Annually.

Disaggregation

Data can be disaggregated by disaster and event type to better prioritise actions for mitigation and prevention. Data can be further disaggregated by chronic (sea level rise) vs episodic (cyclones, floods, landslides, droughts) events.

Best Practices

Disasters are likely to be episodic and need to be considered when assessing the trend. In particular, the effects of climate phenomenon such as the El Niño Southern Oscillation (ENSO), Intertropical Convergence Zone (ITCZ), and South Pacific Convergence Zone (SPCZ) should be taken into consideration when analysing trends over time. Other factors such as temperature and precipitation data may be needed to correlate the metric with potential causes. In addition, there can be compounding effects of cumulative events which increases exposure and vulnerability of communities that can increase the likelihood of losses from events. The cumulative impacts should also be addressed during discussion of this indicator.

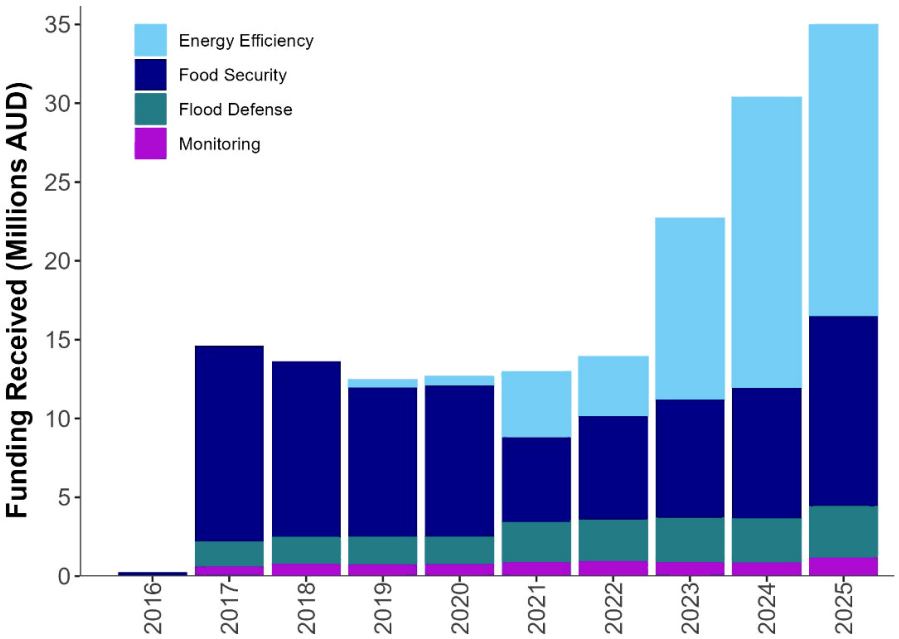
In order to compare losses over time, costs of damage need to be reported in inflation adjusted values using the same currency. Total economic loss can also be reported as a proportion of a country's gross domestic product (GDP) to account for economic valuation of more difficult components, such as loss of life and ecosystem services.

Linkages to MEA and other frameworks and strategies

- → 2050 Strategy for the Blue Pacific Continent – Climate Change and Disasters
- → Framework for the Development of Environment Statistics 4.1.2
- → Global Set of Climate Change Statistics and Indicators 40, 41
- → SDG 11.b, 13.1
- → SAMOA Pathway/ABAS – 51, 52
- → Sendai Framework for Disaster Risk Reduction
- → SPREP Strategic Plan 2017–2026 Regional Objectives 1.2, 1.5
- → United Nations Framework Convention on Climate Change (UNFCCC)

INDICATOR

Climate-based Adaptation and Mitigation Funding



Funding received for Climate-based Adaptation and Mitigation from 2016–2025.
[Hypothetical data for illustrative purposes only.]

Indicator Definition

Total funds received to implement all climate change adaptation and mitigation projects.

Key Terms

Climate-based Adaptation: the adjustments and actions individuals, communities, and systems take to prepare for the impacts of climate change.

Climate-based Mitigation: actions to reduce the flow of heat-trapping greenhouse gases into the atmosphere.

Purpose

This indicator uses funding received to implement projects as a proxy for the improved capacity of countries to adapt to climate change impacts and reduce their carbon footprint.

Desired Outcome

Positive or stable trend in climate-based adaptation and mitigation funding and to ensure climate change projects are adequately financed.

Assumptions

Assumes data across multiple projects are collected and consolidated and assumes that increases in funding result in improved outcomes for climate change adaptation and mitigation.

Calculation

Total funds received in inflation adjusted currency are summed annually for adaptation and mitigation projects.

$$\sum(\text{funds received adaptation}) + \sum(\text{funds received mitigation})$$

$\sum$(funds received adaptation) = **sum of the funds received for climate change adaptation.**
$\sum$(funds received mitigation) = **sum of the funds received for climate change mitigation.**

Hypothetical Example of Calculation

For a given year, a country receives AUD 10 million to increase energy efficiency, AUD 50 million to build sea walls around low lying areas exposed to inundation, and AUD 10 million for irrigation to combat drought years. Therefore, this indicator would involve adding the total funds received (10m + 50m + 10m) and is calculated as AUD 70 million.

Data Sources

Environment, finance and infrastructure ministries, NGOs, Biennial Transparency Reports, State and Trends in Adaptation (STA) Series (https://gca.org/reports/), Lowy Institute Pacific Aid Map (https://pacificaidmap.lowyinstitute.org/).

Data Collection

Data are summarised by the ministry, NGOs, and other agencies based on funding received or spent. Funding should include those received from funding mechanisms established under the United Nations Framework Convention on Climate Change and the Paris Agreement and/or from bilateral donors.

Frequency of Data Collection

Annually.

Disaggregation

Data can be disaggregated by adaptation and mitigation actions and/or specific actions to better understand how funds are dispersed.

Best Practices

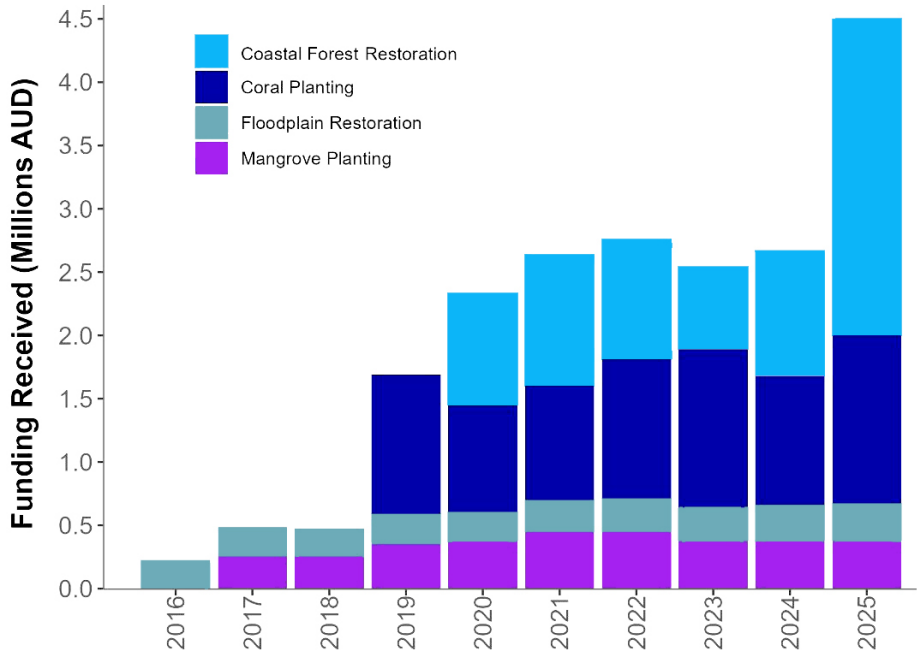
Discussion of this indicator should include how climate finance has enabled implementation of adaptation and mitigation projects, such as reducing and averting greenhouse gas emissions and enabling energy access. Discussion should include whether the funding received is comparable to the amount of funding needed to implement adaptation and mitigation and how much of the funding is actually expended in relation to the amount received. In order to compare funding over time, funding received needs to be reported in inflation adjusted values using the same currency.

Linkages to MEA and other frameworks and strategies

- → 2050 Strategy for the Blue Pacific Continent – Climate Change and Disasters
- → Coral Triangle Initiative
- → Framework for the Development of Environment Statistics 6.1.1
- → Framework for Energy Security and Resilience in the Pacific (2021–2030)
- → Framework for Resilient Development in the Pacific 1, 2, 3
- → Global Set of Climate Change Statistics and Indicators 135
- → Kunming-Montreal Global Biodiversity Framework Goal D, Targets 8, 11, 14, 19, 20
- → Pacific Bioscapes Logframe
- → Pacific Coral Reef Action Plan 2021–2030 5.15
- → Pacific Islands Framework for Nature Conservation and Protected Areas 2021–2025 – Strategic Obj. 5, 6
- → Pacific Islands Regional Marine Species Programme (PIRMSP) 2022–2026
- → SDG 6.6, 12.2, 13.1, 14.2, 14.5, 15.1
- → SAMOA Pathway/ABAS – 51, 52
- → Sendai Framework for Disaster Risk Reduction
- → SPREP Strategic Plan 2017–2026 Regional Objectives 1.1, 1.2, 1.3, 1.4, 1.5
- → United Nations Convention to Combat Desertification (UNCCD)
- → United Nations Framework Convention on Climate Change (UNFCCC)

INDICATOR

Funding for Ecosystem-based Adaptation and Mitigation



Funding received for Ecosystem-based Adaptation and Mitigation from 2016–2025.
[Hypothetical data for illustrative purposes only.]

Indicator Definition

Funds received to implement ecosystem-based approaches to climate adaptation and mitigation.

Key Terms

Ecosystem-based Adaptation: a nature-based solution that harnesses biodiversity and ecosystem services to reduce vulnerability and build resilience of human communities to climate change.

Ecosystem-based Mitigation: the use of ecosystems for their carbon storage and sequestration service to reduce greenhouse gas emissions and mitigate climate change.

Purpose

Improved financial investments into ecosystem-based climate adaptation and mitigation are correlated with a variety of climatic, cultural, ecological, environmental, and social benefits.

Desired Outcome

Positive trend in funds received for ecosystem-based approaches to adaption and mitigation, and to ensure that countries are more able to respond to climate change.

Assumptions

Assumes these data across multiple projects, grants, and programmes are collected and consolidated.

Calculation

Ecosystem-based adaptation (EBA) and mitigation (EBM) funds in inflation adjusted currency are summed annually.

$$\sum(\text{funds received for EBA}) + \sum(\text{funds received for EBM})$$

$\sum$(funds received for EBA) = **sum of the funds received for ecosystem-based adaptation.**

$\sum$(funds received for EBM) = **sum of the funds received for ecosystem-based mitigation.**

Hypothetical Example of Calculation

For a given year, a country receives AUD 20 million to plant trees for carbon sequestration, AUD 20 million to plant mangroves for flood attenuation, and AUD 10 million for coral planting to counteract coral bleaching events. Therefore, this indicator would involve adding the total funds received (20m + 20m + 10m) and is calculated as AUD 50 million.

Data Sources

Government environment and climate change ministries, NGOs, civil society, and System of Environmental Economic Accounts (SEEA), State and Trends in Adaptation (STA) Series (https://gca.org/reports/), Lowy Institute Pacific Aid Map (https://pacificaidmap.lowyinstitute.org/).

Data Collection

Funds received and spent for projects should be reported by the government agencies and NGOs and may also be available from donors or the UN-SEEA.

Frequency of Data Collection

Annually.

Disaggregation

Data can be disaggregated by ecosystem-based adaptation and mitigation actions to understand how funds are disbursed. Data should also be disaggregated by funding received and funding spent to complete projects.

Best Practices

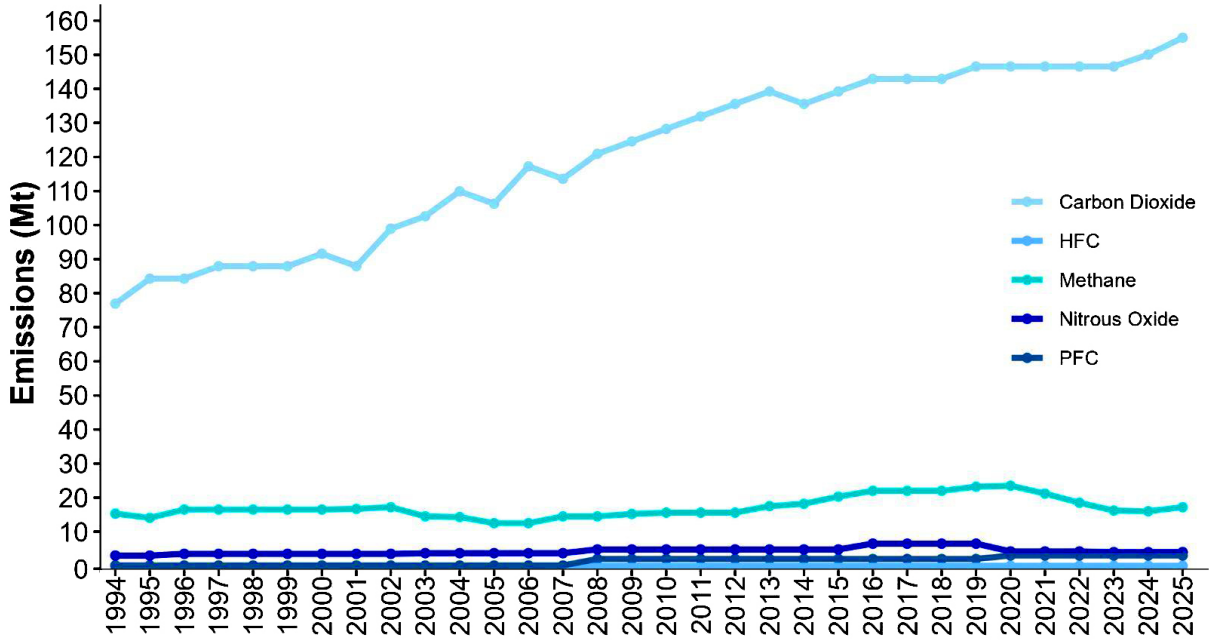
Adaptation and mitigation projects do not have to be just restoration focused and may include introducing limits on seasonal harvest of fish, promoting sustainable farming practices, and many others. Discussion should include whether the funding received is comparable to the amount of funding needed to implement adaptation and mitigation and how much of the funding is actually expended in relation to the amount received. Discussion should also be centred around the project outcomes and proposed return on investment. If the funding was public, there should be a ranking of implementation available to assess project outcomes. In order to compare funding over time, funding received needs to be reported in inflation adjusted values using the same currency.

Linkages to MEA and other frameworks and strategies

- → 2050 Strategy for the Blue Pacific Continent – Climate Change and Disasters, Ocean and Environment
- → Coral Triangle Initiative
- → Framework for the Development of Environment Statistics 6.1.1
- → Framework for Resilient Development in the Pacific
- → Global Set of Climate Change Statistics and Indicators 135
- → Kunming-Montreal Global Biodiversity Framework Goal D, Targets 2, 8, 11, 14, 19, 20
- → Pacific Bioscapes Logframe
- → Pacific Coral Reef Action Plan 2021–2030 4.9, 4.10, 6.35.15
- → Pacific Islands Framework for Nature Conservation and Protected Areas 2021–2025 – Strategic Obj. 5, 6
- → Pacific Islands Regional Marine Species Programme (PIRMSP) 2022–2026
- → Ramsar Convention on Wetlands 4th Strategic Plan – Target 2
- → SDG 6.6, 12.2, 13.1, 14.2, 14.5, 15.1
- → SAMOA Pathway/ABAS – 44, 51, 52, 92, 106
- → Sendai Framework for Disaster Risk Reduction
- → SPREP Strategic Plan 2017–2026 Regional Objectives 1.2, 1.4, 2.1, 2.2, 4.4
- → United Nations Convention to Combat Desertification (UNCCD)
- → United Nations Framework Convention on Climate Change (UNFCCC)

INDICATOR

Greenhouse Gas (GHG) Emissions



Greenhouse Gas Emissions from 1994–2025. [Hypothetical data for illustrative purposes only.]

Indicator Definition

Annual greenhouse gas (GHG) emissions as per Biennial Transparency Reports (BTR) and National Inventory Reports (NIR).

Key Terms

GHG: gases released into the atmosphere that trap heat and contribute to the warming of the planet, a phenomenon known as the greenhouse effect. The primary GHGs include carbon dioxide (CO2), methane (CH4), nitrous oxide (N2O), and fluorinated gases, such as perfluorocarbons (PFC) and hydrofluorocarbons (HFC).

Biennial Transparency Reports (BTR): report released every two years that provides information on national inventory reports (NIR), progress towards Nationally Determined Contributions (NDC), policies and measures, climate change impacts and adaptation, levels of financial, technology development and transfer and capacity-building support, capacity-building needs and areas of improvement.

Nationally Determined Contributions (NDC): action plans developed by each country to reduce national emissions and adapt to the impacts of climate change.

National Inventory Reports (NIR): report of anthropogenic GHG emissions by sources and removals/sinks, which may be submitted as a stand-alone report or as a component of a BTR.

Purpose

Greenhouse gas emissions are the primary cause of global warming. Countries have committed to reduce GHG emissions through the UNFCCC and Paris Agreement by aligning their Nationally Determined Contributions towards a net-zero target (GHG production is balanced or equal to GHG removal), and this indicator tracks progress towards these commitments.

Desired Outcome

Negative trend in GHG emissions.

Assumptions
Assumes data are accurately reported in BTRs and NIR on a 2-yearly basis.

Calculation
GHG Inventories as per defined by NIR and BTR in metric tonnes.

∑ (GHG produced by sector) = **the sum of greenhouse gas emissions produced per sector (Mt).**

Hypothetical Example of Calculation
A country has an NIR that shows the industrial sector produces 50 Mt of CO2, energy sector produces 100 Mt of CO2, and agricultural sector produces 10 Mt of methane. The CO2 emissions would be summed (50 Mt +100 Mt) and reported as 150 Mt of CO2. The methane emissions would be reported as 10 Mt of methane.

Data Sources
Government ministries responsible for energy production and reporting to UNFCCC, Global Carbon Project (https://www.globalcarbonproject.org/), System of Environmental Accounts (SEEA) Air Emission Accounts provides residential accounting (a subset of the inventory accounting), Regional Pacific NDC Hub, UNFCCC guidelines for reporting on National Communications and Biannual Reports (https://unfccc.int/preparation-of-ncs-and-brs).

Data Collection
Inventory level GHG as defined in each country's NIR and BTR in metric tonnes.

Frequency of Data Collection
Annually.

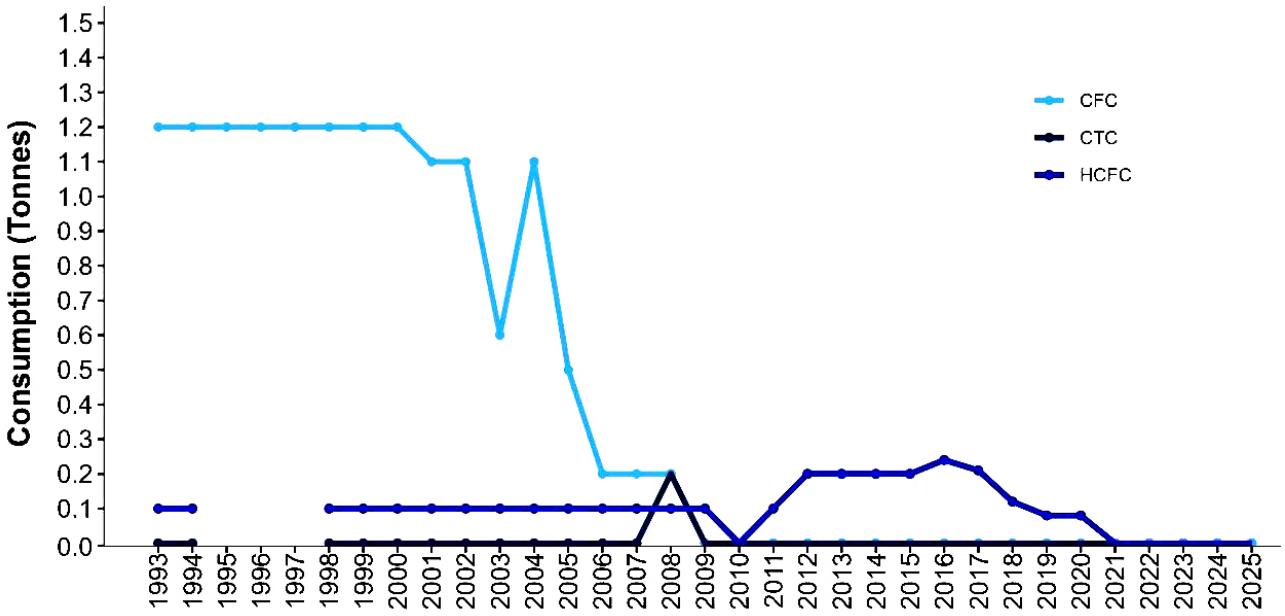
Disaggregation
Data can be disaggregated by sector (energy, industrial process, agriculture, Land Use, Land-Use Change, and Forestry (LULUCF), waste, etc.) and by type (carbon dioxide, methane, nitrous oxide). Emissions can be presented as both gross emissions and net emissions which include GHG removals from the Land Use, Land-Use Change, and Forestry (LULUCF) sector.

Best Practices
Discussion of this indicator can include both gross emissions and net emissions. Progress towards Nationally Determined Contributions (NDC) can also be discussed to understand how countries are meeting commitments.

Linkages to MEA and other frameworks and strategies
- → 2050 Strategy for the Blue Pacific Continent – Climate Change and Disasters
- → Framework for the Development of Environment Statistics 3.1.1
- → Framework for Resilient Development in the Pacific 2ia, 2ib, 2id, 2ie 2if, 2ig, 2ih, 2ii, 2ij, 2ik, 2il
- → Global Set of Climate Change Statistics and Indicators 1–9
- → Kunming-Montreal Global Biodiversity Framework Goal A (i), Targets 8, 11
- → Paris Agreement
- → Pacific Coral Reef Action Plan 2021–2030 5.15
- → SDG 7.2, 11.b, 13.2
- → SAMOA Pathway/ABAS – 32, 43, 92
- → SPREP Strategic Plan 2017–2026 Regional Objectives 1.1, 1.2, 1.3, 1.4, 3.1
- → United Nations Convention to Combat Desertification (UNCCD)
- → United Nations Framework Convention on Climate Change (UNFCCC)

INDICATOR

Ozone Depleting Substances



Consumption of Ozone-depleting Substances from 1993–2025. [Hypothetical data for illustrative purposes only.]

Indicator Definition

Annual consumption or imports of ozone depleting substances (ODS).

Key Terms

ODS: substances that harm the ozone layer which includes chlorofluorocarbons (CFCs), hydrochlorofluorocarbons (HCFCs), halons, methyl bromide, carbon tetrachloride, and methyl chloroform.

Purpose

ODS such as CFCs destroy the earth's protective ozone layer. This indicator tracks national commitments to phasing out ODS under the Montreal Protocol.

Desired Outcome

Negative trend in annual ODS consumption or imports.

Assumptions

All countries have ratified the Montreal Protocol but assumes there is access to data on ODS imports or use.

Calculation

Annual total imports or consumption, frequently measured in Ozone Depleting Potential (ODP) units (tonnes multiplied by their ozone-depleting potential).

$$\sum \text{(ODS consumption)} + \sum \text{(ODS imported)}$$

$\sum$ (ODS consumption) = **the sum of ODS that is consumed by the country.**
$\sum$ (ODS imported) = **the sum of ODS that is imported into the country.**

Hypothetical Example of Calculation

A country imports 1.1 ODP of CFC, produces 0.1 ODP of CFCs, imports 0.1 HCFCs, and produces 0.1 ODP of HCFCs. The import and production of the CFC would be summed (1.2 ODP + 0.1 ODP) and reported as 1.2 ODP of CFCs. The import and production of the HCFC would be summed (0.1 ODP + 0.1 ODP) and reported as 0.2 ODP of HCFCs.

Data Sources

Government ministries responsible for monitoring imported goods and reporting to Montreal Protocol, United Nations Environment Programme (UNEP) Data Center, UNEP Ozone Secretariat (https://ozone.unep.org/countries).

Data Collection

Data are typically tracked through customs import monitoring and licensing systems.

Frequency of Data Collection

Annually.

Disaggregation

Data can be disaggregated by ODS type, bank (existing equipment, chemical stockpiles, products), or sector (industrial, commercial or residential refrigeration).

Best Practices

Discussion can indicate which ODS banks or sectors contribute to ODS consumption, imports, or stockpiles if any persist.

Linkages to MEA and other frameworks and strategies

- → 2050 Strategy for the Blue Pacific Continent – Climate Change and Disasters
- → Framework for the Development of Environment Statistics 3.1.2
- → Framework for Resilient Development in the Pacific 2ik
- → Global Set of Climate Change Statistics and Indicators 135
- → Kunming-Montreal Global Biodiversity Framework Goal A (i), Targets 8, 11
- → Montreal Protocol
- → Pacific Coral Reef Action Plan 2021–2030 5.15
- → SDG 7.2, 11.b, 12.4, 13.2
- → SAMOA Pathway/ABAS – 45
- → SPREP Strategic Plan 2017–2026 Regional Objectives 1.1, 1.2, 1.3, 1.4, 3.1

INDICATOR

Pacific Climate Change Preparedness Scorecard

INDICATORS FOR THE PACIFIC CLIMATE CHANGE PREPAREDNESS SCORECARD		NO	PARTIAL	YES
1. ADAPTATION PLANNING				
1.1	An up-to-date national adaptation plan (NAP; or Joint National Action Plan including an implementation plan) has been published and is being implemented.			
1.2	Adaptation action is coordinated at a sectoral level evidenced by sector adaptation plans or mainstreaming of adaptation into sector plans and policies.			
1.3	Mechanisms are in place to facilitate inclusive involvement of stake-holders in national adaptation planning, including incorporation of views from sectors (horizontal) and sub-national level (vertical).			
1.4	A systematic prioritisation of adaptation activities (e.g. country programme, project pipeline etc) with indicative costs and potential funders identified, endorsed by the relevant authority.			
1.5	Actions to address climate change adaptation are supported by a national level authoritative financial entity (e.g. a Ministry of Finance) which is able to facilitate access international climate finance (the financial mechanisms of the UNFCCC - GEF, GCF and AF)			
2. ADDRESSING IMPACTS AND VULNERABILITIES (INCLUDING EARLY WARNING SYSTEMS)				
2.1	Observational systems are in place to enable the monitoring of weather and climate change.			
2.2	The country has access to Multi-Hazard Early Warning Systems (MHEWS) and can effectively disseminate warnings to communi-ties.			
2.3	Up-to-date scenarios and climate projections are used to inform national adaptation planning.			
2.4	Up-to-date scenarios and climate projections are used to inform national adaptation planning.			
2.5	A consistent approach to vulnerability assessments is used at an island level with a standardised methodology.			
3. MAINSTREAMING CLIMATE ADAPTATION				
3.1	Climate change adaptation considerations are included in the country's Environmental Impact Assessment legisla-tion (or in the developments approval document/consent licenses/approval conditions).			
3.2	National Development Plans (national strategic plans, national sustainable development plans, frameworks, or similar) consider the impacts of climate change.			
3.3	Climate change information and knowledge (including climate science; vulnerability and risk assessments; policies and plans; traditional knowledge; and information from civil society) is being collated and organised and is in publicly accessible formats.			

*The scorecard provides a list of questions that serve as the sub-indicators for this indicator.

Indicator Definition
A set of sub-indicators for measuring climate change adaptation and preparedness across three focus areas (Adaptation Planning, Addressing Impacts and Vulnerabilities, Mainstreaming Climate Adaptation).

Key Terms
N/A.

Purpose
There is a need for a consistent methodology for assessing adaptation and preparedness and this indicator provides a rapid assessment of these measures.

Desired Outcome
Progress towards effective adaptation and preparedness (ideally 'yes' for all sub-indicators)

Assumptions
Assumes data are available for completing scorecard.

Calculation
The sub-indicators have been compiled into a scorecard format with each assessed against "No", "Partial", or "Yes" criteria, developed to be as objective and unambiguous as possible to allow the practitioner to impartially determine a robust answer. In addition, progress towards each indicator can be described in more detail in a brief narrative section. Within each focus area (e.g. Adaptation Planning) sub-indicators can be 'averaged' to determine overall states and trends, resulting in three states and trends (one for each focus area).

Data Sources
Environment ministries, Regional Pacific NDC Hub.

Data Collection
These data are typically available from planning documents and national policies.

Frequency of Data Collection
Annually.

Disaggregation
N/A.

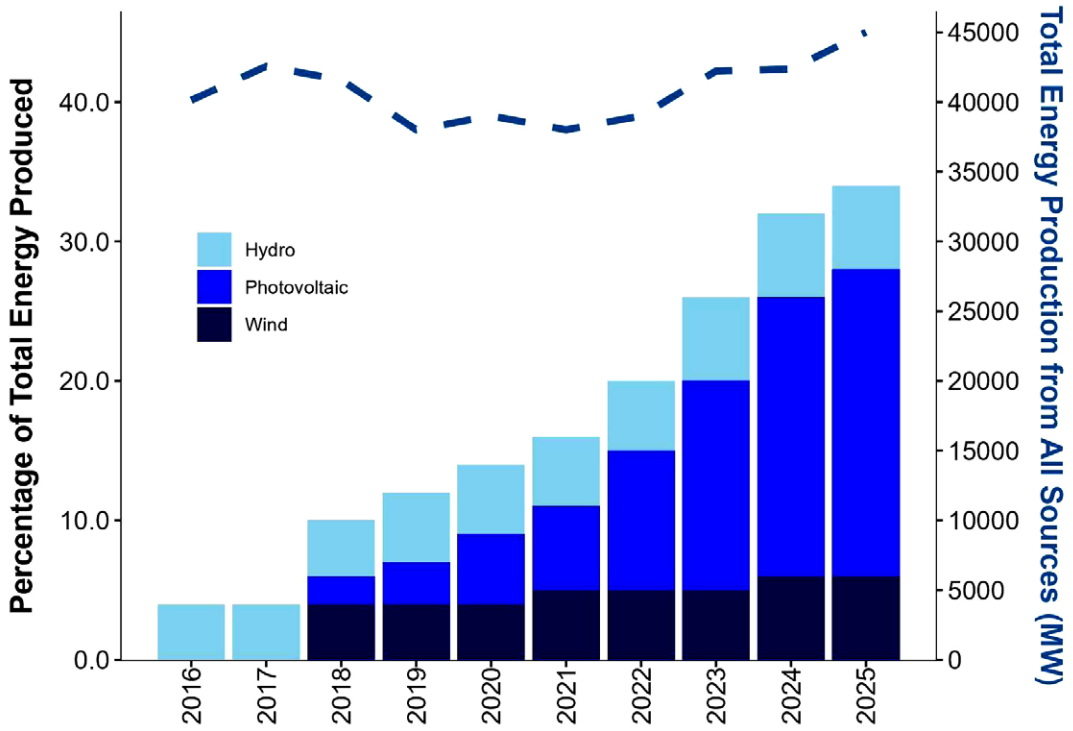
Best Practices
Progress towards each indicator can be described in more detail in a brief narrative section.

Linkages to MEA and other frameworks and strategies

- → 2050 Strategy for the Blue Pacific Continent – Climate Change and Disasters
- → Framework for the Development of Environment Statistics 6.3.1
- → Pacific Bioscapes Logframe
- → Paris Agreement
- → SAMOA Pathway/ABAS – 11, 15, 31–46, 51, 52
- → SDG 11.b, 13.1
- → Sendai Framework for Disaster Risk Reduction
- → SPREP Strategic Plan 2017–2026 Regional Objectives 1.2, 1.5
- → United Nations Framework Convention on Climate Change (UNFCCC)

INDICATOR

Renewable Energy



Renewal Energy produced from 2016–2025. [Hypothetical data for illustrative purposes only.]

Indicator Definition

Percentage of annual production of energy from renewable energy sources.

Key Terms

Renewable energy: energy derived from natural sources that are replenished at a higher rate than they are consumed.

Purpose

Energy generation is the main source of GHG emissions globally. Pacific islands are particularly vulnerable to fluctuations in fossil fuel cost and availability. Renewable energy production represents a country's ability to implement actions to reduce carbon footprints.

Desired Outcome

Positive trend in energy productions from renewable sources.

Assumptions

These data should be readily available from the ministry of energy, energy provider, or equivalent.

Calculation

Percentage of energy produced by renewable energy in megawatt (MW) as a proportion of the total energy produced (MW).

$$\frac{\sum \text{(renewable energy production)}}{\sum \text{(total energy production)}} * 100\%$$

∑ (renewable energy production) = **the sum of renewable energy produced by the country.**

∑ (total energy production) = **the sum of total energy production for the country.**

Hypothetical Example of Calculation

A country generates 40,000 MW of energy per year with 10,000 MW generated by hydropower and 5,000 MW generated by solar. The sum of the renewable energy (10,000 + 5,000 MW) would be 15,000 MW and the indicator would be calculated as 15,000 MW / 40,000 MW * 100% = 37.5%.

Data Sources

Government ministries responsible for energy production, national statistics offices, energy providers, Asia Pacific Energy Portal (https://asiapacificenergy.org/), IRENA Renewable Energy statistics (https:// www.irena.org/Statistics), | ADB Pacific Energy Update series (https://www.adb.org/publications/pacific-energy-update-2021).

Data Collection

Total energy production and energy from renewable sources are typically available from the government ministries or energy providers. Data should be representative of the area of interest and not confined to specific areas.

Frequency of Data Collection

Annually.

Disaggregation

Data can be disaggregated by renewable energy sources to better understand contributions to energy.

Best Practices

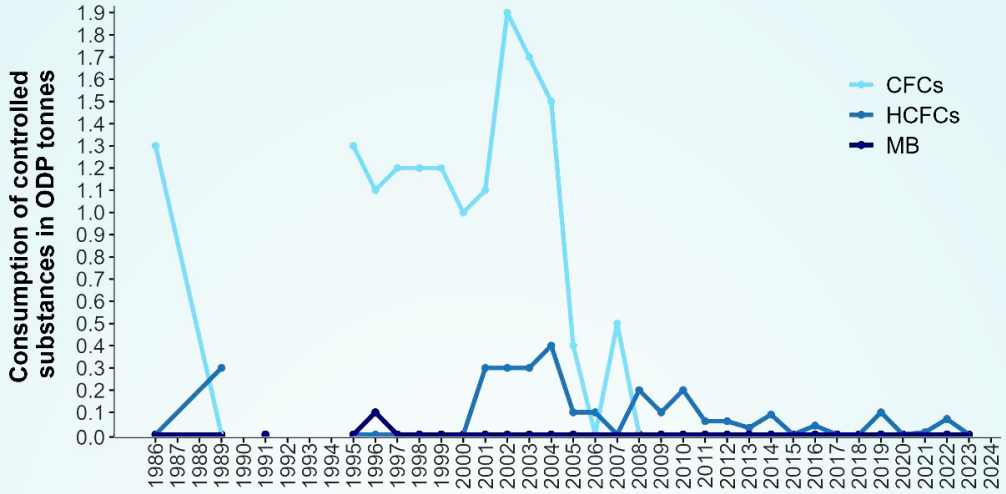
Discussion can include which energy sources are most abundant and how these sources are spatially distributed across the country or region. For example, discussion may include whether outer islands, that may have less access to resources, are using a variety of renewable energy sources to meet energy needs.

Linkages to MEA and other frameworks and strategies

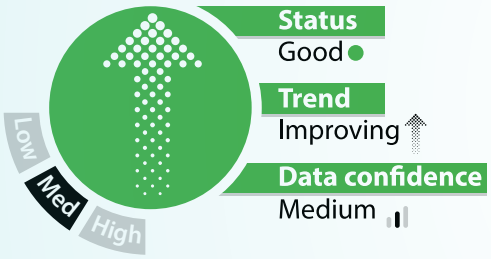
- → 2050 Strategy for the Blue Pacific Continent – Climate Change and Disasters
- → Framework for the Development of Environment Statistics 2.2.2
- → Framework for Energy Security and Resilience in the Pacific (2021–2030)
- → Framework for Resilient Development in the Pacific 2ia, 2ib, 2id, 2ie, 2if, 2ig, 2ih, 2ii, 2ij, 2ik, 2il
- → Global Set of Climate Change Statistics and Indicators 109
- → Kunming-Montreal Global Biodiversity Framework Targets 8, 10, 11, 16
- → Noumea Convention
- → SDG 7.2, 7.a, 7.b, 11.b, 13.2
- → SAMOA Pathway/ABAS – 47–50
- → SPREP Strategic Plan 2017–2026 Regional Objectives 1.1
- → United Nations Framework Convention on Climate Change (UNFCCC)

INDICATOR IN ACTION

OZONE DEPLETING SUBSTANCES IN THE FEDERATED STATES OF MICRONESIA (FSM)



Consumption of CFCs and HCFCs in FSM between 1986 and 2023.
Values are given in ozone depleting potential (ODP) units, which is a measure of the relative amount of degradation to the ozone layer that ODS chemicals can cause (UNEP Data Center).



Since 2009, FSM has phased out CFC consumption to zero Ozone Depleting Potential (ODP) units (UNEP 2018). Similar progress is under way for the HCFCs, which are also being phased out. The imports of HCFCs decreased by more than 97% from a baseline consumption of 2.55 metric tonnes to 0.07 metric tonnes in 2022 and FSM has zeroed out imports in several years (2020, 2021, and 2023). In 2023 the consumption reduction of HCFCs surpassed the 35% reduction target from its baseline, indicating that the country is in the advanced stages of phasing out HCFC consumption ahead of the Montreal Protocol reduction schedule.

Between 2011 and 2023, the consumption of HCFCs in FSM has dropped below 0.1 ODP tonnes. FSM is establishing regulations to ban the import of HCFC-based equipment, and has set up the Refrigeration and Air Conditioning (RAC) Association to support the implementation of HCFCs phase-out activities (UNEP 2018). Across the four states of FSM, RAC Associations servicing equipment and tools have been distributed that comprise: (i) a recovery machine, (ii) recovery cylinders, (iii) servicing tool boxes, (iv) refrigerant recovery kit and (v) vacuum pumps. The country also complies with the reporting of illegal trade to the Ozone Secretariat. In efforts to curb trade of mislabelled refrigerants, the FSM confiscated and stored 180 canisters for a total of 45 kg of Dichlorodifluoromethane (CFC) in 2015. The FSM ceased imports of CFCs in 2008 even before the global ban in 2010. The FSM is progressing well in the total phase-out of HCFC consumption, reaching a 97% reduction of HCFC imports in 2018.

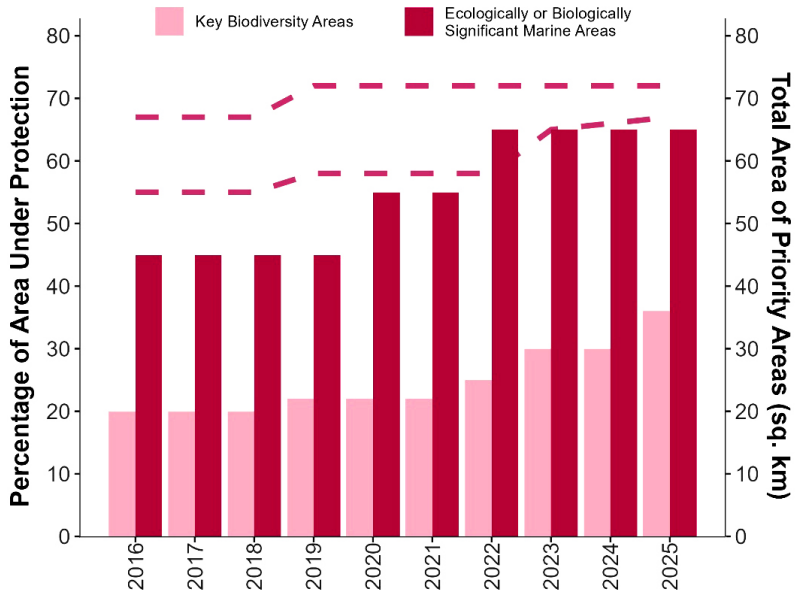
Biodiversity

The Pacific islands region is known for its rich complexes of marine and terrestrial ecosystems which support high numbers of endemic species, some of which may only be found on specific islands or archipelagos. The theme of **Biodiversity** presents a total of nine indicators that are focused on ensuring species persistence and protection as well as tracking threats to biodiversity:

- Areas Important for Biodiversity Protected
- Assessment of Protected Area Management Effectiveness
- Invasive Species Under Management or Eradicated
- IUCN Red List Summary
- Marine Protected Areas
- Priority Sites with Invasive Species Managed
- Status of Migratory Species of Concern
- Terrestrial Protected Areas
- Wetlands

INDICATOR

Areas Important for Biodiversity Protected



Percentage of Important Areas for Biodiversity Under Protection. [Hypothetical data for illustrative purposes only.]

Indicator Definition

Percentage of land and marine areas identified as Key Biodiversity Areas (KBAs) and Ecologically or Biologically Significant Marine Areas (EBSAs) that are covered by protected areas.

Key Terms

Key Biodiversity Areas: the most important places in the world for species and their habitats (https://www.keybiodiversityareas.org/).

Ecologically or Biologically Significant Marine Areas: an area of the ocean that has special importance in terms of its ecological and/or biological characteristics, for example, as essential habitats, food sources, or breeding grounds for particular species.

Purpose

KBAs and EBSAs represent the most important sites for biodiversity conservation worldwide and are identified nationally using globally standardised criteria and thresholds. This indicator determines whether these areas are under formal protection, which provides additional mechanisms to reduce potential impacts to the species and ecosystems that the areas represent.

Desired Outcome

Positive trend in important areas for biodiversity protected or all important areas protected.

Assumptions

Assumes up to date spatial data are available on important biodiversity areas and protected areas.

Calculation

Percentage of the spatial area of important biodiversity areas that are under protection.

$$\frac{\sum(\text{area of important biodiversity areas protected})}{\sum(\text{area of important biodiversity areas})} * 100\%$$

$\sum$ (area of important biodiversity areas protected) =
sum of the area of important biodiversity areas that are under protected status.

$\sum$ (area of important biodiversity areas) = **sum of the area of important biodiversity areas.**

Hypothetical Example of Calculation

A country has four important biodiversity areas that total an area of 100 square kilometres. However, not all of these areas have protected area status and only 44.5 square kilometres are currently designated as protected areas or within the boundaries of protected areas. Therefore, the calculation for this indicator is 44.5 sq. km / 100.0 sq. km * 100% = 44.5%.

Data Sources

Environment ministry,

Conserving Our Sea of Islands State of Protected and Conserved Areas in Oceania (https://biopama.org/wp-content/uploads/2024/03/Pacific-SoPACA-Report-2022.pdf),

World Database of Key Biodiversity Areas (http://www.keybiodiversityareas.org/home),

World Database on Protected Areas (https://www.protectedplanet.net/),

Important Bird and Biodiversity Areas (http://datazone.birdlife.org).

Data Collection

Data can be calculated from spatial data (if mapped) or calculated from management plans or designations.

Frequency of Data Collection

Annually.

Disaggregation

Data can be disaggregated into KBAs and EBSAs.

Best Practices

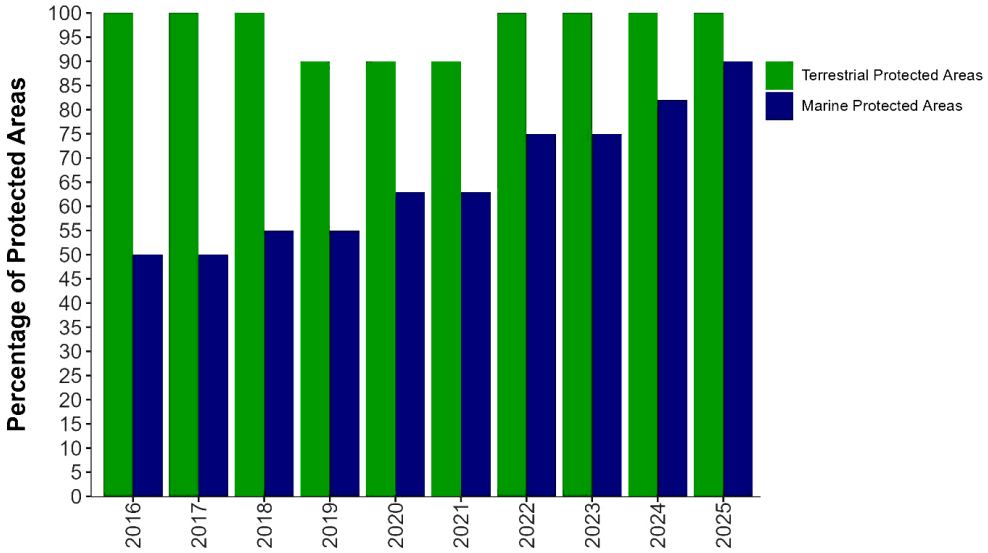
Occasionally, the methodology for designating KBAs and EBSAs changes and therefore there may be artifacts in the trend of this indicator. Absolute values for both the area under protection and total area of important biodiversity areas should be reported to provide more clarity on what percentages mean.

Linkages to MEA and other frameworks and strategies

- → 2050 Strategy for the Blue Pacific Continent – Ocean and Environment
- → Coral Triangle Initiative
- → Framework for the Development of Environment Statistics 1.2.2
- → Global Set of Climate Change Statistics and Indicators 144
- → Kunming-Montreal Global Biodiversity Framework Goal A (i, iii, vii), B (i, iii), Targets 1, 3, 4, 8
- → Pacific Bioscapes Logframe
- → Pacific Coral Reef Action Plan 2021–2030 5.13, 6.7
- → Pacific Islands Framework for Nature Conservation and Protected Areas 2021–2025 – Strategic Obj. 3, 4
- → Pacific Islands Regional Marine Species Programme (PIRMSP) 2022–2026
- → Samarkand Strategic Plan for Migratory Species 2024–2032 – Goal 2
- → SAMOA Pathway/ABAS – 58, 80, 90, 94
- → SDG 6.6, 12.2, 14.2, 14.5, 15.1, 15.2, 15.5
- → SPREP Strategic Plan 2017–2026 Regional Objectives 2.1, 2.2, 2.3
- → United Nations Convention to Combat Desertification (UNCCD)

INDICATOR

Assessment of Protected Area Management Effectiveness



Percentage of Protected Areas with Protected Area Management Effectiveness Assessments (PAME).
[Hypothetical data for illustrative purposes only.]

Indicator Definition

Percentage of formal protected areas (PAs) and Other Effective Area-based Conservation Measures (OECMs) where protected area management effectiveness assessments (PAME) have been completed using standard PAME tools.

Key Terms

PAME: the assessment of how well protected areas are being managed – primarily the extent to which management is protecting values and achieving goals and objectives.

Other Effective Area-based Conservation Measures (OECMs): geographically defined area other than a protected area, which is governed and managed in ways that achieve positive and sustained long-term outcomes for the *in situ* conservation of biodiversity, with associated ecosystem functions and services and where applicable, cultural, spiritual, socio-economic, and other locally relevant values.

Purpose

Protecting terrestrial and marine areas is only one component of protection and effective management of areas is needed to realise benefits to species biodiversity, people, and the environment. This indicator determines how well management is protecting values and achieving goals and objectives.

Desired Outcome

Positive trend in number of managed protected areas that are assessed for management effectiveness.

Assumptions

Assumes PAME assessments are being undertaken in the country and that PAME assessments lead to increased effectiveness.

Calculation

Percentage of the number of protected areas and OECM evaluated for management effectiveness.

$$\frac{\sum \text{(PA and OECM assessed using PAME tools)}}{\sum \text{(PA and OECM)}} * 100\%$$

∑ (PA and OECM assessed using PAME tools) = sum of the number of protected areas and OECM that have protected area assessments.

∑ (PA and OECM) = sum of the number of protected areas and OECM.

Hypothetical Example of Calculation

A country has 10 protected areas and OECM. Protected area management effectiveness assessments were completed for six of the 10 protected areas and OECM. Therefore, the calculation for this indicator is 6 / 10 = 60.0%.

Data Sources

Environment ministry, Conserving Our Sea of Islands State of Protected and Conserved Areas in Oceania (https://biopama.org/wp-content/uploads/2024/03/Pacific-SoPACA-Report-2022.pdf), World Database on Protected Areas (https://www.protectedplanet.net/), SPREP Pacific Islands Protected Area Portal (www.pipap.sprep.org).

Data Collection

PAME tools include Rapid Assessment and Prioritization of Protected Area Management (RAPPAM), Management Effectiveness Tracking Tool (METT), and integrated Management Effectiveness Tool (IMET). Elinor (https://elinordata.org/) is also a cost effective simple assessment of protected area effectiveness. The IUCN Green List of Protected and Conserved Areas may also be used to supplement this indicator (https://iucngreenlist.org/).

Frequency of Data Collection

Annually.

Disaggregation

Data can be disaggregated by terrestrial and marine protected areas, local or national management, and whether the PAME produced a positive assessment score.

Best Practices

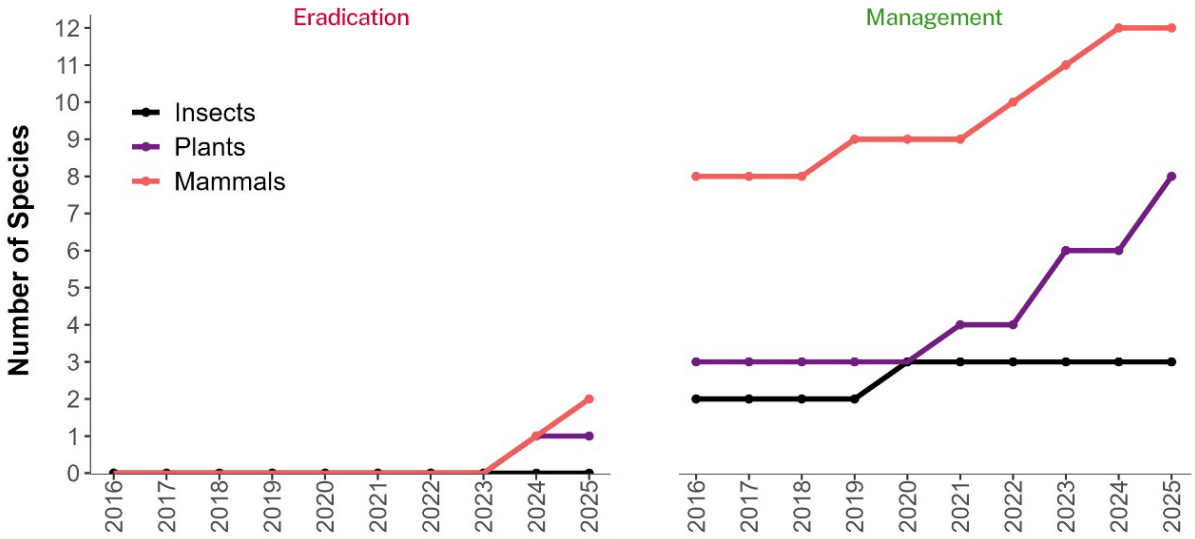
Although this indicator meets typical global reports, this indicator needs further discussion regarding the percentage of protected areas where PAMEs met globally agreed standards of good governance, sound design and planning, and effective management. The IUCN Green List of Protected and Conserved Areas can be a sub-indicator to inform management effectiveness. Additionally, one assessment method (see Data Collection above) may not work for all protected areas. Generic Management Effectiveness Tracking Tool (METT) assessments have been noted to be difficult to assess for community-based protected areas as these do not meet some of the criteria.

Linkages to MEA and other frameworks and strategies

- → 2050 Strategy for the Blue Pacific Continent – Ocean and Environment
- → Coral Triangle Initiative
- → Kunming-Montreal Global Biodiversity Framework Goals A (i, ii, iii, vii), B (i, iii), Targets 1, 3, 4, 6, 8
- → Pacific Bioscapes Logframe
- → Pacific Coral Reef Action Plan 2021–2030 1, 5, 6, 8
- → Pacific Islands Framework for Nature Conservation and Protected Areas 2021–2025 Objectives 3 and 4
- → Pacific Islands Regional Marine Species Programme (PIRMSP) 2022–2026
- → Ramsar Convention on Wetlands 4th Strategic Plan
- → Samarkand Strategic Plan for Migratory Species 2024–2032 – Goal 2
- → SAMOA Pathway/ABAS – 58, 80, 90, 94
- → SDG 6.6, 12.2, 14.2, 14.5, 15.1, 15.2, 15.5
- → SPREP Strategic Plan 2017–2026 Regional Objectives 2.1, 2.2, 2.3
- → United Nations Convention to Combat Desertification (UNCCD)

INDICATOR

Invasive Species Under Management or Eradicated



Priority Invasive Species from 2016–2025. [Hypothetical data for illustrative purposes only.]

Indicator Definition

Number of national priority invasive species that are under management or eradicated.

Key Terms

Invasive species: subset of established non-native alien or naturalised species that are a threat to native species and biodiversity.

Purpose

Priority invasive species can have severe environmental and economic impacts. This indicator is a proxy for the effectiveness of invasive species eradication and management programmes.

Desired Outcome

Positive trend in the number of invasive species under management or eradicated.

Assumptions

Assumes that management of invasive species is effective and there are benefits to the environment, native species, and humans.

Calculation

Annual sum of number of priority invasive species eradicated or under management. This should be cumulative for species that have been eradicated but not for species for which management has stopped.

$$\sum \text{(invasive species under management or eradicated)} = \textbf{sum of the number of invasive species that are under management or eradication efforts.}$$

Hypothetical Example of Calculation

A country currently manages a variety of invasive species – including 12 insect species, eight plant species, and two mammal species.

Therefore, this indicator would be calculated as 12 + 8 + 2 = 22 species.

Data Sources
Environment Ministry, SPREP (Island and Ocean Ecosystems), Global Invasive Species Database, Pacific Pest List Database, Database of Island Invasive Species Eradication, Battler Resource Base of the Pacific Invasive Learning Network.

Data Collection
Data should be available from environmental ministries and regionally from the SPREP Invasive Species Team.

Frequency of Data Collection
Annually.

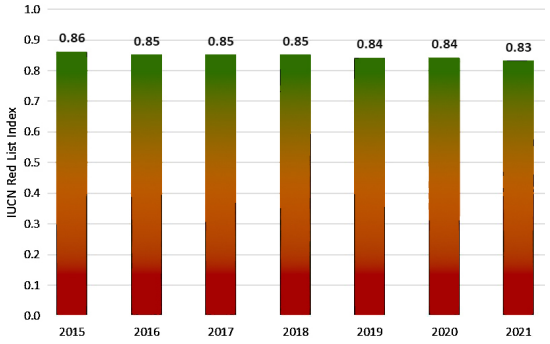
Disaggregation
Data can be disaggregated by taxa and whether they are under management or eradicated.

Best Practices
Discussion can include efforts where eradication has occurred at a sub-national level, such as eradication of species on individual islands and which taxa were targeted at this level. Management should include measures to control pathways such as border screening and eradication methods. Additional analysis is needed to correctly measure effectiveness of management and the impacts of management on biodiversity and the environment.

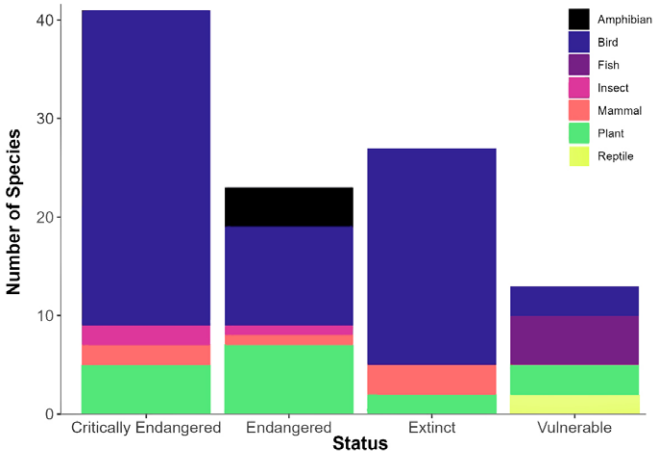
Linkages to MEA and other frameworks and strategies
- → 2050 Strategy for the Blue Pacific Continent – Ocean and Environment
- → Convention on the Conservation of Migratory Species of Wild Animals
- → Framework for the Development of Environment Statistics 1.2.2
- → Kunming-Montreal Global Biodiversity Framework Targets 2, 4, 6, 8, 11, 12
- → Pacific Coral Reef Action Plan 2021–2030 4.3, 5.16, 7.3
- → Pacific Islands Framework for Nature Conservation and Protected Areas 2021–2025 – Strategic Obj. 5
- → Ramsar Convention on Wetlands 4th Strategic Plan – Target 4
- → Samarkand Strategic Plan for Migratory Species 2024–2032 – Goal 3
- → SAMOA Pathway/ABAS – 95
- → SDG 6.3, 6.6, 14, 15.1, 15.5
- → SPREP Guiding Framework for Invasive Species Management
- → SPREP Strategic Plan 2017–2026 Regional Objectives 2.4

INDICATOR

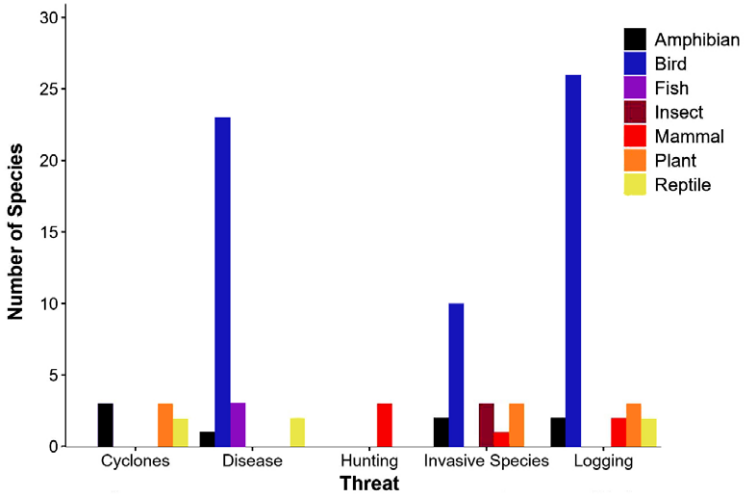
IUCN Red List Summary



IUCN Red List Index.



IUCN Red List by Taxa. [Hypothetical data for illustrative purposes only.]



Factors Threatening Species survival for IUCN Red Listed Species. [Hypothetical data for illustrative purposes only.]

Indicator Definition

Number of species listed in the International Union for Conservation of Nature (IUCN) Red List and summary of their threats.

Key Terms

IUCN Red List: an inventory of the global conservation status and extinction risk of biological species

Purpose

This indicator tracks the status of threatened species and outlines the most important threats to these species that are operating at a national scale.

Desired Outcome

Reduction in the number of threatened species over time.

Assumptions

Assumes that all or most species have been formally assessed under IUCN criteria. Note that an increase in the number of threatened species over time may reflect more species being assessed in intervening years.

Calculation

Total numbers of each type of species (e.g. grouped by Class) in each threat category and their dominant threat types. The IUCN Red List Index can also provide an overall extinction risk value.

For each threat category: ∑ (species in each threat category)

For each threat: ∑ (species in each threat class)

∑ (species in each threat category) = sum of the species for each IUCN threat category: Data Deficient, Least Concern, Near Threatened, Vulnerable, Endangered, Critically Endangered, Extinct in the Wild, and Extinct.

∑ (species in each threat class) = sum of the species for each threat class (e.g. habitat loss, invasive species, overharvesting, etc.)

Hypothetical Example of Calculation

A country has four plant species that are categorised as Vulnerable, two coral species that are Vulnerable, and three bird species that are Critically Endangered. The calculation for the Vulnerable category would be 4 + 2 or 6 species, while the calculation for the Critically Endangered category would be three.

Of these species, one of the four plant species are threatened by invasive species, the two coral species are threatened by climate change, and the three bird species are threatened by climate change. The calculation for the invasive species threat would be one and the calculation for the climate change threat would be 2 + 3 = 5 species.

Data Sources

IUCN Red List of threatened species and Red List Index (https://www.iucnredlist.org/).

Data Collection

Data are available from IUCN's website.

Frequency of Data Collection

Annually, although assessments are typically done every 5 to 10 years and therefore these indicators are not sensitive at the annual scale. The number of species and Red List Index will likely not change until assessments are updated and therefore the trends for the indicator are best interpreted over 5 to 10 years.

Disaggregation

Data should be disaggregated by taxa and conservation status.

Best Practices

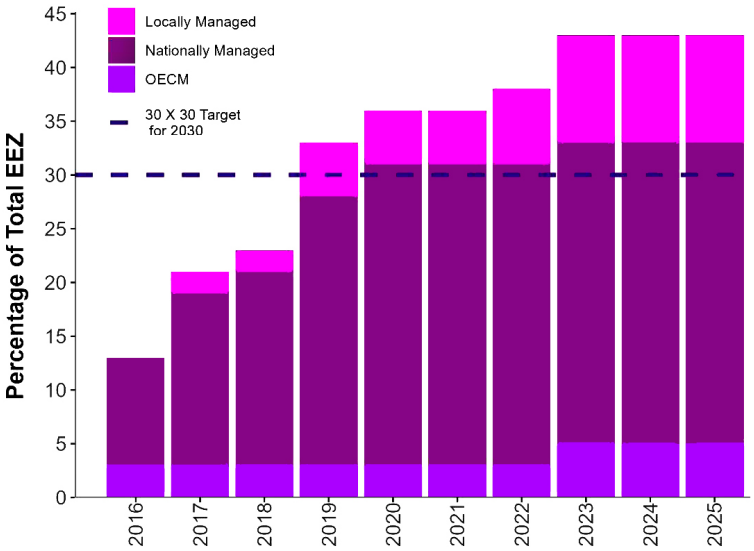
Certain species or taxa may be affected by multiple threats so care should be taken when interpreting the total number of species impacted per threat. Additionally, the Red List Index does not include all taxa (currently lacks insects, reptiles, and most plants) and further discussion may be needed to address that species that are not assessed.

Linkages to MEA and other frameworks and strategies

- → 2050 Strategy for the Blue Pacific Continent – Ocean and Environment
- → CITES – Strategic Vision 2011–2030: Goal 2
- → Coral Triangle Initiative
- → Framework for the Development of Environment Statistics 1.2.2
- → Kunming-Montreal Global Biodiversity Framework Goal A (v, vi), Targets 4, 5, 21
- → Pacific Bioscapes Logframe
- → Pacific Islands Framework for Nature Conservation and Protected Areas 2021–2025 – Strategic Obj. 4
- → SAMOA Pathway/ABAS – 90, 94 d
- → SDG 14, 15.5, 15.7, 15.C
- → SPREP Strategic Plan 2017–2026 Regional Objectives 2.1, 2.2, 2.3

INDICATOR

Marine Protected Areas



Percentage of Exclusive Economic Zones designated as Marine Protected Areas.
[Hypothetical data for illustrative purposes only.]

Indicator Definition

Percentage of Exclusive Economic Zone (EEZ) formally protected for conservation or identified as Other Effective Area-based Conservation Measures (OECMs).

Key Terms

Exclusive Economic Zone: an area of the sea in which a sovereign state has exclusive rights regarding the exploration and use of marine resources, including energy production from water and wind.

Other Effective Area-based Conservation Measures (OECMs): geographically defined area other than a protected area, which is governed and managed in ways that achieve positive and sustained long-term outcomes for the *in situ* conservation of biodiversity, with associated ecosystem functions and services and where applicable, cultural, spiritual, socio-economic, and other locally relevant values.

Purpose

Protected areas are established to protect biodiversity, cultural, and ecosystem values from resource extraction and unsustainable harvesting. OECMs are areas that are managed for other purposes but contribute to long-term biological conservation. This indicator tracks progress towards international commitments for protecting biodiversity and resources.

Desired Outcome

Positive trend of area protected and OECMs progress towards the 30 x 30 Target, which is 30% of the EEZ under protection.

Assumptions

Assumes all marine protected areas and OECMs are accurately mapped. This indicator gives no indication of the management effectiveness of marine protected areas or their protection/conservation of biodiversity.

Calculation

Percentage of the area of the EEZ that is protected by marine protected areas and OECMs.

$$\frac{\sum \text{(area of marine PA and OECM)}}{\text{area of EEZ}} * 100\%$$

∑ (area of marine PA and OECM) = **sum of the area of marine protected areas or marine OECM.**

area of EEZ = **area of the Exclusive Economic Zone (EEZ).**

Hypothetical Example of Calculation

A country has 10 marine protected areas and five OECMs that total an area of 255 square kilometres. The country's EEZ has a total area of 1,000 square kilometres. Therefore, the calculation for this indicator is 255 sq. km / 1,000 sq. km * 100% = 25.5%.

Data Sources

Environment ministry, World Database on Protected Areas (https://www.protectedplanet.net/), SPREP Pacific Islands Protected Area Portal (www.pipap.sprep.org).

Data Collection

Area can be calculated from spatial data if mapped or calculated from management plans or designations. Indigenous waters are often voluntarily managed for conservation benefit but there may be sensitivities regarding the availability of these data and boundaries may not be demarcated.

Frequency of Data Collection

Updated as new areas are calculated or designated.

Disaggregation

Data can be disaggregated by ownership, management, or tenure to better understand stakeholder equity of water protection.

Best Practices

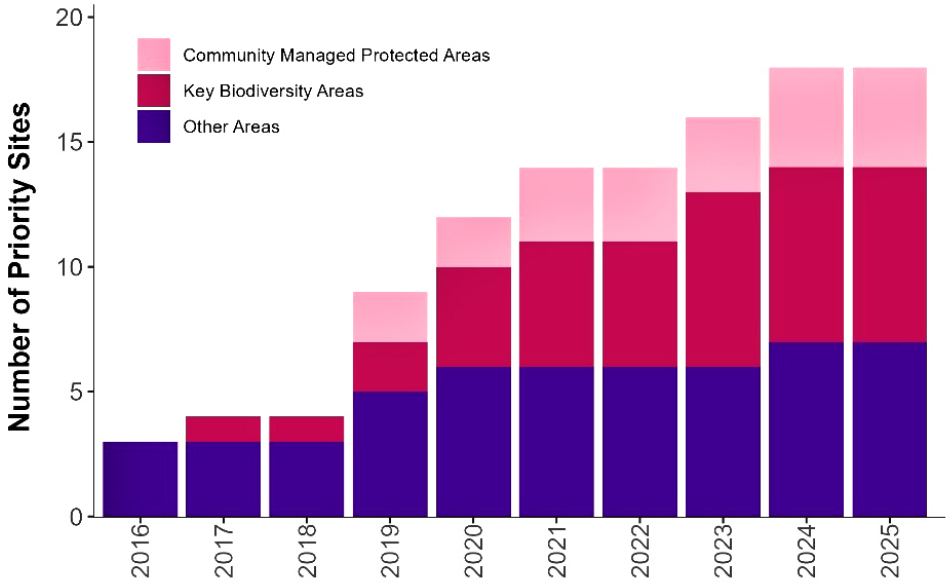
Many indigenous landowners have undertaken voluntary management over their waters for conservation benefit and many marine areas in the Pacific are established by communities. These areas are not demarcated or mapped and may be underrepresented. National accounting of community-managed areas should be conducted in order to appropriately assess this indicator.

Linkages to MEA and other frameworks and strategies

- → 2050 Strategy for the Blue Pacific Continent – Ocean and Environment
- → Convention on the Conservation of Migratory Species of Wild Animals
- → Convention on the Protection of the Underwater Cultural Heritage
- → Framework for the Development of Environment Statistics 1.2.2
- → Global Set of Climate Change Statistics and Indicators 144
- → Kunming-Montreal Global Biodiversity Framework Goals A (i, iii, vii), B (i, iii), Targets 1, 2, 3, 4, 8, 11
- → Micronesia Challenge 2030
- → Pacific Bioscapes Logframe
- → Pacific Coral Reef Action Plan 2021–2030 5.10, 5.14
- → Pacific Islands Framework for Nature Conservation and Protected Areas 2021–2025 – Strategic Obj. 3
- → Pacific Islands Regional Marine Species Programme (PIRMSP) 2022–2026
- → Samarkand Strategic Plan for Migratory Species 2024–2032 – Goal 2
- → SAMOA Pathway/ABAS – 58, 80, 90, 94
- → SDG 14.2, 14.5
- → SPREP Strategic Plan 2017–2026 Regional Objectives 2.1, 2.2

INDICATOR

Priority Sites with Invasive Species Managed



Number of Priority Sites with Invasive Species Management. [Hypothetical data for illustrative purposes only.]

Indicator Definition

Number of priority sites with multi-invasive taxa management programmes.

Key Terms

Priority sites: locations with high ecological, biodiversity, and cultural value (e.g. islands with high biodiversity).

Purpose

This indicator represents effort to protect resources at ecologically, biologically, and culturally significant sites.

Desired Outcome

Positive trend in number of priority sites with invasive species management.

Assumptions

Assumes that management of invasive species is effective, which can be difficult to quantify, and that there is standardisation for designation of priority areas (such as Key Biodiversity Areas). Sites that have completed eradication should be considered still under management if control and maintenance is being implemented.

Calculation

Number of priority sites with invasive species management.

∑ (priority sites with invasive species management) = **sum of the number of priority sites with invasive species management being undertaken.**

Hypothetical Example of Calculation

A country has eight Key Biodiversity Areas, six community-based protected areas, and four culturally important areas that have invasive species management programmes. Therefore, the calculation for this indicator is 8 + 6 + 4 = 18 priority areas.

Data Sources
Environment Ministry, NGOs, SPREP (Island and Ocean Ecosystems).

Data Collection
Data should be available from environmental ministries and regionally from the SPREP Invasive Species Team.

Frequency of Data Collection
Annually.

Disaggregation
Data should be disaggregated by type of priority sites, such as Key Biodiversity Areas, nationally or community managed protected areas, agricultural sites, or others if data allow. Data could be further disaggregated into types of management (biocontrol, mowing, etc.), if data allow.

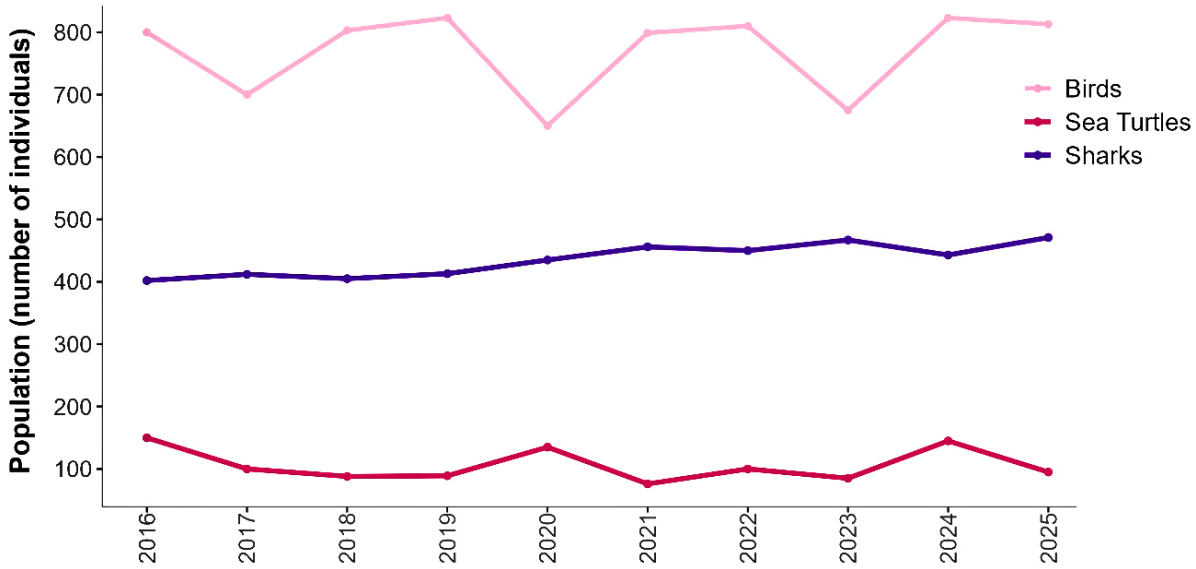
Best Practices
While effectiveness is not directly captured in this indicator, discussion can highlight successes and lessons learned as well as feasibility of implementing invasive species management at sites. It is important to note that it may be very difficult to achieve 100% management of all priority sites.

Linkages to MEA and other frameworks and strategies

- → 2050 Strategy for the Blue Pacific Continent – Ocean and Environment
- → Framework for the Development of Environment Statistics 1.2.2
- → Kunming-Montreal Global Biodiversity Framework Goal A (i, iii, v, vii), Targets 1, 2, 3, 4, 6, 8, 10, 12
- → Micronesia Challenge 2030
- → Pacific Coral Reef Action Plan 2021–2030 4.3, 5.16
- → Pacific Islands Framework for Nature Conservation and Protected Areas 2021–2025 – Strategic Obj. 5
- → Ramsar Convention on Wetlands 4th Strategic Plan – Target 4
- → SAMOA Pathway/ABAS – 95
- → SDG 6.3, 6.6, 14, 15.1, 15.2
- → SPREP Guiding Framework for Invasive Species Management
- → SPREP Strategic Plan 2017–2026 Regional Objectives 2.1, 2.2, 2.4

INDICATOR

Status of Migratory Species of Concern



Populations of Migratory Species from 2016–2025. [Hypothetical data for illustrative purposes only.]

Indicator Definition

Population size or occupancy of selected migratory species.

Key Terms

Migratory species: animals that move from one region to another on a seasonal basis, typically in response to changes in food availability, climate, or breeding conditions.

Purpose

Migratory species serve a variety of economic, cultural, and biological roles and are important indicators for assessing change in habitats and ecosystems.

Desired Outcome

Stable or increasing population size or occupancy.

Assumptions

Requires rigorous and ongoing monitoring programmes for selected priority species that often employ repeated surveys or measurements.

Calculation

Number of individuals counted or estimated per year or presence/absence of a species at a site over time.

∑ (individuals) = **sum of the number of individuals in the population for each of the migratory species being monitored.**

Hypothetical Example of Calculation

A country has a monitoring programme for both migratory birds and shark species. The programme estimates that the population of a bird species is 100,000 and the population of a shark species is 1,000. These numbers would be directly reported for this indicator.

Data Sources

Environment ministry, NGOs, scientific literature, Global Biodiversity Information Facility, Biotime (https://biotime.st-andrews.ac.uk/), Western and Central Pacific Fisheries Commission's Stock Status And Management Advice (for shark species – https://www.wcpfc.int/current-stock-status-and-advice), data from researchers and universities.

Data Collection

Various specific methods are available for estimating population size such as point counts, occupancy and n-mixture models, and transect counts. Presence/absence can also be used as a measure of occupancy when abundance data are lacking.

Frequency of Data Collection

Annually.

Disaggregation

Data should be disaggregated by species or taxa.

Best Practices

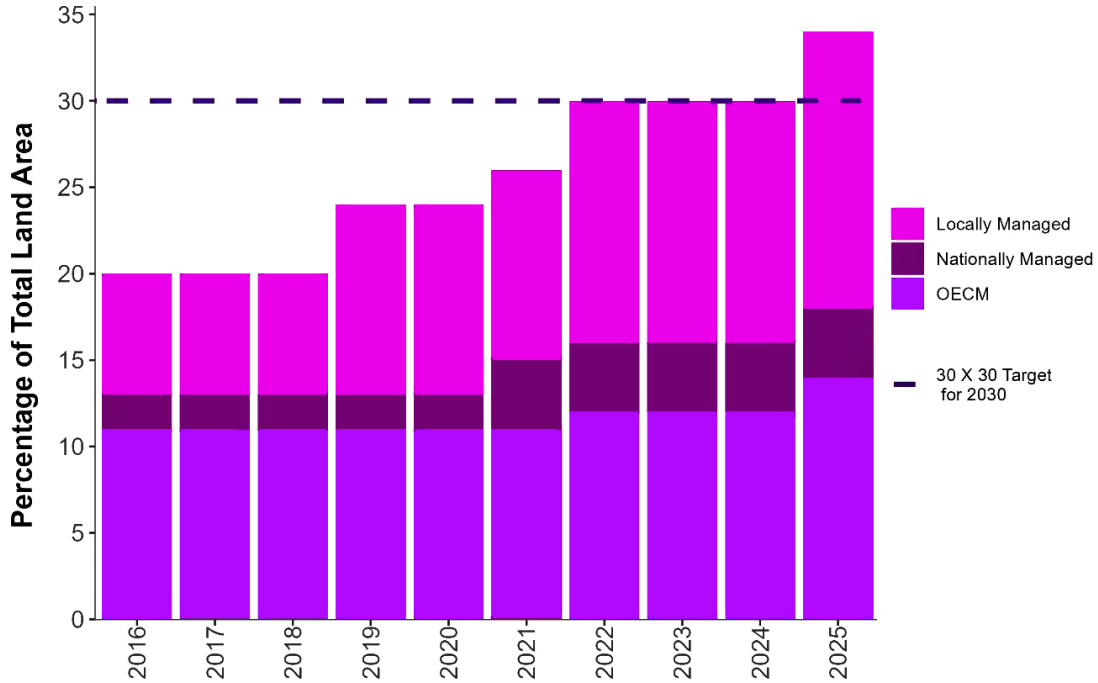
Populations typically naturally fluctuate due to survivorship, site fidelity, natural disasters, disease outbreaks, etc. and long term trends (over 10–50 years) are needed to properly assess this indicator. Traditional knowledge can provide important information on the status and trend of this indicator, particularly in the form of historical evidence and data for species patterns and relative abundance.

Linkages to MEA and other frameworks and strategies

- → 2050 Strategy for the Blue Pacific Continent – Ocean and Environment
- → Convention on the Conservation of Migratory Species of Wild Animals
- → Coral Triangle Initiative
- → Framework for the Development of Environment Statistics 1.2.2
- → Kunming-Montreal Global Biodiversity Framework Goals A (v, vi, viii), B (iii, iv), Targets 4, 5, 9, 10
- → Memorandum of Understanding on the Conservation of Migratory Shark
- → Memorandum of Understanding on Pacific Cetaceans
- → Memorandum of Understanding on Dugong
- → Pacific Bioscapes Logframe
- → Pacific Islands Framework for Nature Conservation and Protected Areas 2021–2025 – Strategic Obj. 4
- → Pacific Islands Regional Marine Species Programme (PIRMSP) 2022–2026
- → Samarkand Strategic Plan for Migratory Species 2024–2032 – Goals 1, 5
- → SAMOA Pathway/ABAS – 90, 94d
- → SDG 14, 15.5, 15.7, 15.c
- → Single Species Action Plan for the Hawksbill Turtle in Southeast Asia and the Western Pacific Ocean Region
- → SPREP Strategic Plan 2017–2026 Regional Objectives 2.1, 2.2, 2.3

INDICATOR

Terrestrial Protected Areas



Percentage of Total Land Area designated as Protected Areas. [Hypothetical data for illustrative purposes only.]

Indicator Definition

Percentage of land area that is formally protected for conservation or identified as Other Effective Area-based Conservation Measures (OECMs).

Key Terms

Other Effective Area-based Conservation Measures (OECMs): geographically defined area other than a protected area, which is governed and managed in ways that achieve positive and sustained long-term outcomes for the *in situ* conservation of biodiversity, with associated ecosystem functions and services and where applicable, cultural, spiritual, socio-economic, and other locally relevant values.

Purpose

Protected areas are established to protect biodiversity, cultural and ecosystem values from resource extraction and unsustainable harvesting. OECMs are areas that are managed for other purposes but contribute to long-term biological conservation. This indicator tracks progress towards international commitments for protecting biodiversity and resources.

Desired Outcome

Positive trend in terrestrial protected areas and OECMs and progress towards the 30 x 30 Target, which is 30% of the total land area under protection.

Assumptions

Assumes all terrestrial protected areas and OECMs are accurately mapped. This indicator gives no indication of the management effectiveness of terrestrial protected areas or their protection/conservation of biodiversity.

Calculation

Percentage of the total land area that is protected by terrestrial protected areas and OECMs.

$$\frac{\sum \text{(area of terrestrial PA and OECM)}}{\text{total land area}} * 100\%$$

∑ (area of terrestrial PA and OECM) = **sum of the area of terrestrial protected areas or terrestrial OECM.**

total land area = **sum of the area of land within the country.**

Hypothetical Example of Calculation

A country has 20 terrestrial protected areas and three OECMs that total an area of 155 square kilometres. The country has a total land area of 555 square kilometres. Therefore, the calculation for this indicator is 155 sq. km / 555 sq. km * 100% = 27.9%.

Data Sources

Environment ministry, World Database on Protected Areas (https://www.protectedplanet.net/), SPREP Pacific Islands Protected Area Portal (www.pipap.sprep.org).

Data Collection

Area can be calculated from spatial data if mapped or calculated from management plans or designations. Indigenous lands are often voluntarily managed for conservation benefit but there may be sensitivities regarding the availability of these data and boundaries may not be demarcated.

Frequency of Data Collection

Updated as new areas are calculated or designated.

Disaggregation

Data can be disaggregated by ownership, management, or land tenure to better understand stakeholder equity of land protection.

Best Practices

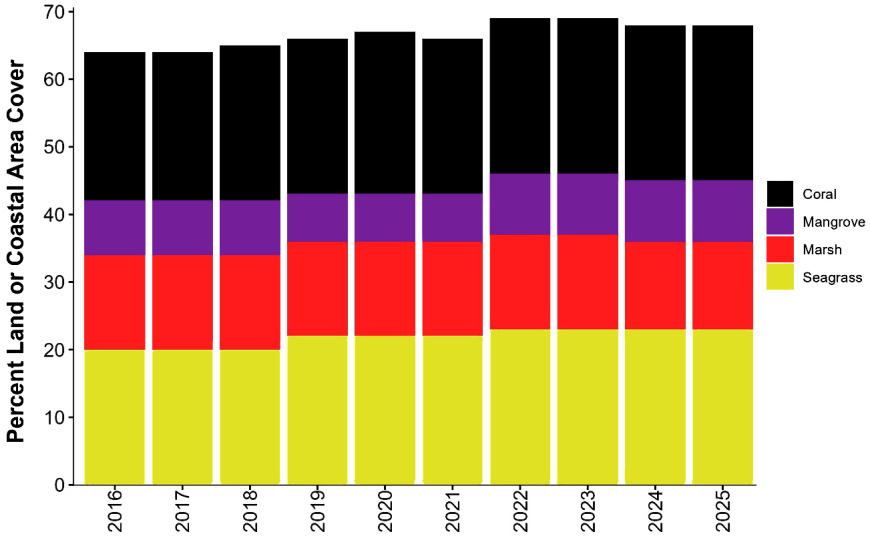
Many indigenous landowners have undertaken voluntary management over their lands and provide for conservation benefits. National accounting of community-managed areas should be conducted in order to appropriately assess this indicator. Greenspaces and bluespaces may also be considered as a component of this indicator but should be identified separately from designated protected areas and OECMs.

Linkages to MEA and other frameworks and strategies

- → 2050 Strategy for the Blue Pacific Continent – Ocean and Environment
- → Convention on the Conservation of Migratory Species of Wild Animals
- → Framework for the Development of Environment Statistics 1.2.2
- → Global Set of Climate Change Statistics and Indicators 144
- → Kunming-Montreal Global Biodiversity Framework Goals A (i, iii, vii), B (i, iii), Targets 1, 2, 3, 4, 8, 11
- → Micronesia Challenge 2030
- → Pacific Bioscapes Logframe
- → Pacific Islands Framework for Nature Conservation and Protected Areas 2021–2025 – Strategic Obj. 3 and 4
- → Pacific Islands Regional Marine Species Programme (PIRMSP) 2022–2026
- → Samarkand Strategic Plan for Migratory Species 2024–2032 – Goal 2
- → SAMOA Pathway/ABAS – 90, 94
- → SDG 6.6, 12.2, 15.1, 15.2, 15.5
- → SPREP Strategic Plan 2017–2026 Regional Objectives 2.1, 2.2, 2.3

INDICATOR

Wetlands



Percentage of Wetland Cover from 2016–2025. [Hypothetical data for illustrative purposes only.]

Indicator Definition

Percentage of area comprising inland or coastal wetlands.

Key Terms

Coastal area: areas extending from the coastline to marine waters that are six metres depth at low tide.

Wetlands (following the Ramsar definition): areas of marsh, fen, peatland, or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish, or salt. This includes areas of marine water with a depth of less than six metres at low tide (seagrasses and corals).

Purpose

Wetlands support unique species assemblages (plants and animals) and ecosystem services not provided by other ecosystems (such as nurseries for economically important fish species, natural flood mitigation, and water filter systems). This indicator tracks the extent of these important ecosystems as a proxy for the services that they provide.

Desired Outcome

Stable trend in wetland area or increasing trend due to restoration.

Assumptions

Assumes wetland areas are accurately mapped and updated on a regular basis.

Calculation

For inland wetlands: Percentage of the total land area that is classified as a wetland.

$$\frac{\sum(\text{area of inland wetland})}{\text{total land area}} * 100\%$$

∑ (area of inland wetland) = **sum of the area of inland wetland.**

total land area = **sum of the area of land within the country.**

For coastal wetlands: Percentage of area extending from the coastline to marine waters that are six metres in depth at low tide that is classified as a wetland.

$$\frac{\sum(\text{area of coastal wetland})}{\text{total land area}} * 100\%$$

∑ (area of coastal wetland) = **sum of the area of coastal wetland.**

total coastal area = **sum of the areas extending from the coastline to marine waters that are six metres depth at low tide.**

Hypothetical Example of Calculation

A country has five inland wetland areas that have a total area of 50 square kilometres. The country has a total land area of 555 square kilometres. Therefore, the calculation for the inland portion of this indicator is 50 sq. km / 555 sq. km * 100% = 9.0%.

A country has an area of 30 square kilometres of c astal wetlands. The country has a total coastal area of 135 square kilometres. Therefore, the calculation for the coastal portion of this indicator is 30 sq. km / 135 sq. km * 100% = 22.2%.

Data Sources

Environment ministry, Ramsar (http://Ramsar.org), Allen Coral Atlas (https://allencoralatlas.org/), Global Mangrove Watch (https://globalmangrovewatch.org), Habitats Ocean+ (https://data.unep-wcmc.org), Global Wetland Watch (https://www.globalwetlandwatch.org).

Data Collection

Wetlands are typically delineated in the field using a combination of techniques, such as soil and vegetation classification and spatial mapping. Wetland, inland, and coastal areas can be calculated from spatial data if mapped or delineated using remote sensing data such as satellite (synthetic aperture radar (SAR), multispectral imagery), aerial, LiDAR, or drone imagery.

Frequency of Data Collection

Full inventories/assessments should be conducted every 5–10 years but loss or restoration can be calculated annually.

Disaggregation

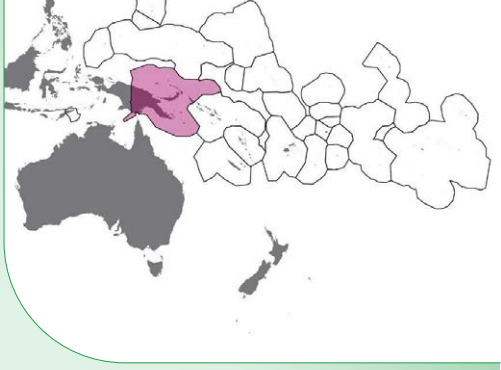
Data can be disaggregated by wetland type (marsh, forested wetland, mangrove, seagrass, coral reef, etc.) to better understand the extent and variety of ecosystems.

Best Practices

Trend can also discuss rate of wetland loss or wetland restoration. Absolute numbers for area (square kilometres or hectares) should also be included as these provide additional information on coverage. While this indicator is looking at short-term trends of wetland loss or restoration, there should be some discussion regarding the long-term historical loss of wetlands within the area of interest. Wetlands that are designated as RAMSAR sites should also be discussed under this indicator.

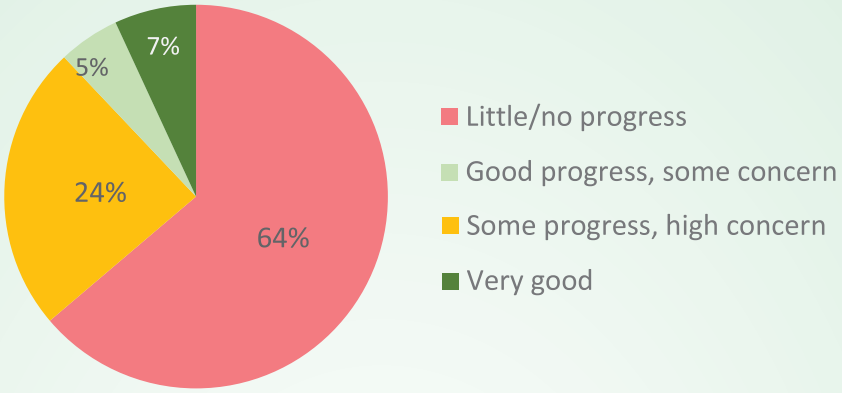
Linkages to MEA and other frameworks and strategies

- → 2050 Strategy for the Blue Pacific Continent – Ocean and Environment
- → Convention on the Conservation of Migratory Species of Wild Animals
- → Framework for the Development of Environment Statistics 1.1.3, 1.2.2
- → Framework for Resilient Development in the Pacific 2id, 2if, 2ii
- → Kunming-Montreal Global Biodiversity Framework Goals A (i, ii, iv, vii, viii), B (iii), Targets 1, 2, 4, 10
- → Pacific Bioscapes Logframe
- → Pacific Coral Reef Action Plan 2021–2030 5.10, 6.1, 6.2, 6.3
- → Pacific Islands Regional Marine Species Programme (PIRMSP) 2022–2026
- → Ramsar Convention on Wetlands 4th Strategic Plan – Target 5, 6, 11
- → Samarkand Strategic Plan for Migratory Species 2024–2032 – Goal 2
- → SAMOA Pathway/ABAS – 58e, 90, 94
- → SDG 6.6, 12.2, 15.1, 15.2, 15.5
- → SPREP Strategic Plan 2017–2026 Regional Objectives 2.1
- → United Nations Convention to Combat Desertification (UNCCD)

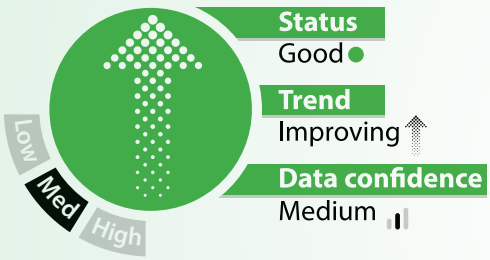


INDICATOR IN ACTION

PROTECTED AREA MANAGEMENT EFFECTIVENESS IN PAPUA NEW GUINEA



Overall progress in protected area management effectiveness in PNG.
Source: Leverington, F. et al. 2017. Assessment of management effectiveness for Papua New Guinea's protected areas 2017, SPREP.



Customary landowners, custodians of 97% of land in Papua New Guinea, recognise many areas of land and sea as *tambu* – areas of special spiritual significance. Customary landownership is therefore integral to PNG's 2.1 million hectares in its 59 protected areas. Protected areas sustain livelihoods, help maintain culture, provide tourism opportunities, store carbon, and protect biodiversity.

The PNG government recognises the importance of effective management of its protected areas. In 2016–2017, the PNG Conservation and Environmental Protection Authority (CEPA), with the support of the United Nations Development Program (UNDP), organised an evaluation of its protected areas, as part of the process to improve management effectiveness.

The key findings of the evaluation were as follows:

- 41 of the 58 protected areas were in good to very good condition
- 45% of the total area protected was in good to very good condition
- Important values are declining in over half of the protected areas

To improve management effectiveness in protected areas, CEPA has developed a Protected Area Policy, endorsed by the National Executive Council. A Protected Areas Bill was passed in 2024. The policy and legislation are strongly orientated towards involvement and ownership by customary landowners. These will assist PNG to meet its Convention on Biodiversity (CBD) target of 30% land as protected areas by 2030.

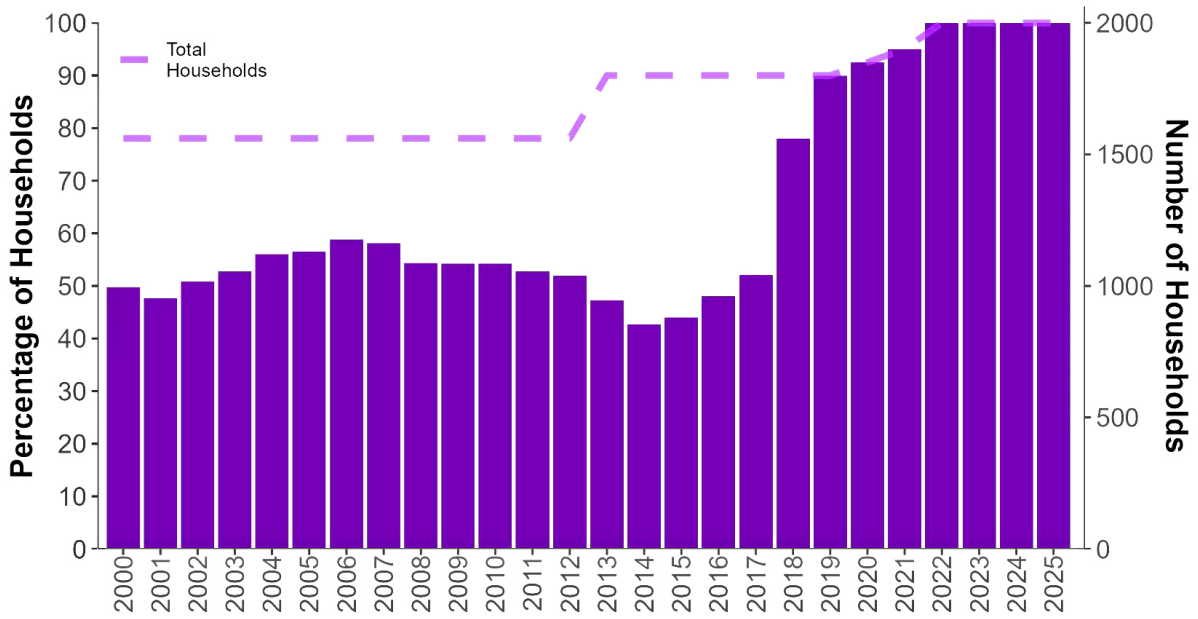
Built Environment

Human populations and communities are an important part of the environment and co-existing with species and ecosystems by minimising impacts is essential to ensure harmony. The theme of **Built Environment** presents a total of five indicators that are focused on tracking management of waste and infrastructure to minimise impacts on the species, environment, and ecosystems:

- Access to and Quality of Sewage Treatment
- Hazardous Waste
- Household Waste Captured
- Municipal Waste Recycled
- Per Capita Generation of Municipal Solid Waste

INDICATOR

Access to and Quality of Sewage Treatment



Percentage of households with access to safely managed sanitation from 2000–2025.
[Hypothetical data for illustrative purposes only.]

Indicator Definition

Percentage of households with safely managed sanitation.

Key Terms

Safely managed sanitation: the use of improved sanitation facilities that are not shared with other households, and where human waste (excreta) is either safely disposed of on-site or transported and treated off-site.

Purpose

Untreated sewage and leaking septic systems are a major source of ground and surface water contamination. This indicator tracks progress in managing sewage in a way that minimises the risk of water contamination.

Desired Outcome

Positive trend in percentage of households with safely managed sanitation.

Assumptions

Assumes that number of houses with safely managed sanitation is recorded and that systems are functional and do not leak sewage.

Calculation

Percentage of households with safely managed sanitation.

$$\frac{\sum(\text{households with safely managed sanitation})}{\sum(\text{households})} * 100\%$$

∑ (households with safely managed sanitation) = sum of the number of households with safely managed sanitation.

∑ (households) = sum of the number of households within a country.

Hypothetical Example of Calculation

A country has a total of 100,000 households. However, not all households are connected to safely managed sanitation and 50,000 are connected to central sewage while 20,000 have sealed septic systems. Therefore, the calculation for this indicator is (50,000 + 20,000) / 100,000 * 100% = 70.0%.

Data Sources

National census data, household surveys, or ministries responsible for waste management or infrastructure, Sustainable Development Report (https://dashboards.sdgindex.org/).

Data Collection

These data are recorded directly in household and census surveys.

Frequency of Data Collection

Annually although household and census surveys are not typically conducted every year.

Disaggregation

Data can be disaggregated by sanitation type (central sewage, septic systems) and geographic area (urban vs. rural) to better understand where improved sanitation is needed. Further disaggregation regarding the quality or age of systems may also be needed to understand potential risks of leakage or failures.

Best Practices

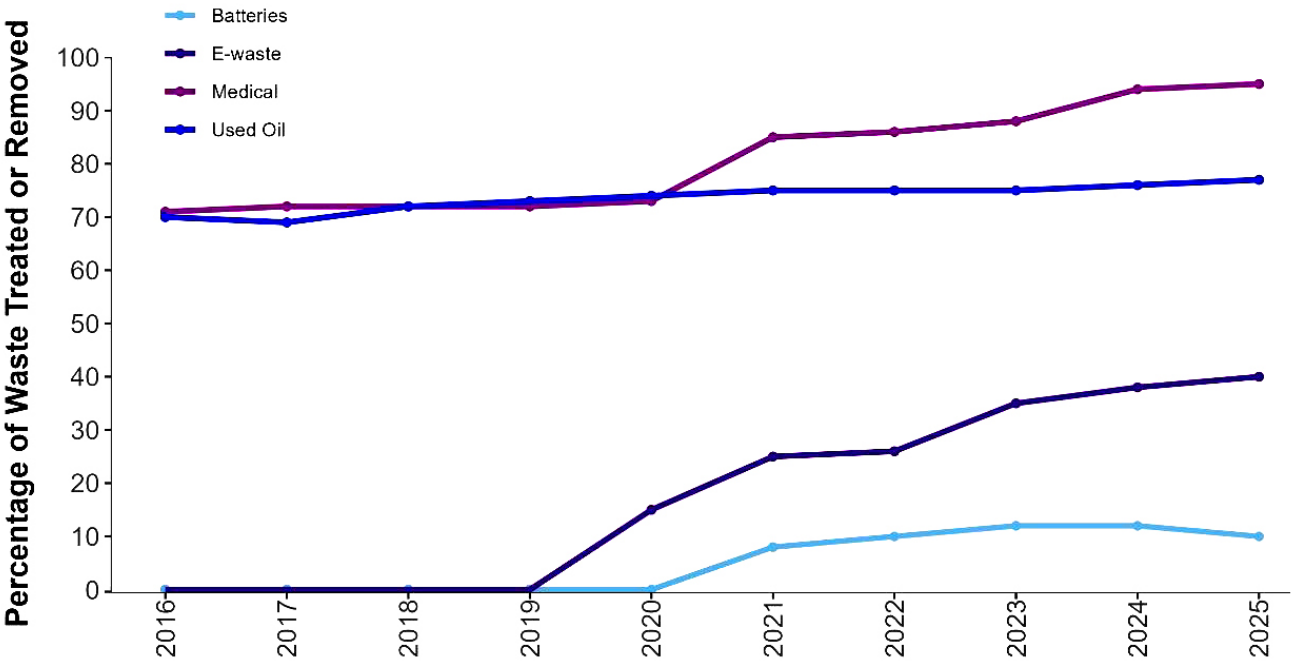
Safely managed sanitation can still pose problems if systems are not properly maintained. For example, failed central sewage treatment facilities can discharge greater volumes of contaminated water whereas on-site wastewater treatment systems have a smaller area of impact. Discussion on the status of systems is needed to further assess this indicator.

Linkages to MEA and other frameworks and strategies

- → 2050 Strategy for the Blue Pacific Continent – People-Centered Development and Ocean and Environment
- → Cleaner Pacific 2025 Strategy – Goals 3, 4
- → Coral Triangle Initiative
- → Framework for the Development of Environment Statistics 3.2.2, 3.2.3, 5.1.2
- → Framework for Resilient Development in the Pacific 2ik
- → Kunming-Montreal Global Biodiversity Framework Goal A (ii), Target 2, 7, 11, 12
- → Noumea Convention
- → Pacific Coral Reef Action Plan 2021–2030 5.16
- → Pacific Islands Framework for Nature Conservation and Protected Areas 2021–2025 – Strategic Obj. 5
- → SAMOA Pathway/ABAS – 58d, 64–65
- → SDG 6.2, 6.3, 6.3.1, 6.A, 11.6, 12.4
- → SPREP Strategic Plan 2017–2026 Regional Objectives 3.1, 3.2

INDICATOR

Hazardous Waste



Hazardous Waste treated or removed from 2016–2025. [Hypothetical data for illustrative purposes only.]

Indicator Definition

Percentage of hazardous waste treated or removed.

Key Terms

Hazardous waste: waste that has physical, chemical, or biological characteristics such that it requires special handling and disposal procedures.

Purpose

Treatment and safe storage of hazardous waste (e.g., medical waste, chemicals and containers, asbestos, used oil, batteries, paint) mitigates the risk to humans and nature. Hazardous materials can have direct and indirect, chronic or acute impacts and this indicator tracks the removal of hazardous waste as a measure to reduce these impacts.

Desired Outcome

100% of hazardous wastes treated or removed.

Assumptions

Assumes disaggregated hazardous waste data are available.

Calculation

Percentage of hazardous waste produced or generated that is safely treated or removed.

$$\frac{\sum \text{(quantity of hazardous waste treated)}}{\sum \text{(quantity of hazardous waste generated)}} * 100\%$$

∑ (quantity of hazardous waste treated) = **sum of the amount of hazardous waste that is treated or moved.**

∑ (quantity of hazardous waste generated) = **sum of the amount of hazardous waste that is produced or generated.**

Hypothetical Example of Calculation

A country generates 10 Mt of oil and 20 Mt of medical waste every year. The oil is treated through a programme which recycles it for other uses and 5.8 Mt of the oil is treated. The medical waste is not treated. Therefore, the calculation for this indicator is 5.8 Mt / 10 Mt * 100% = 58.8% for oil and 0 Mt / 20 Mt = 0% for medical waste.

Data Sources

Ministries responsible for waste management, health or infrastructure, United Nations Statistics Division (UNSD).

Data Collection

Direct numbers should be available from ministries.

Frequency of Data Collection

Annually.

Disaggregation

Data should be disaggregated by hazardous waste type to better understand capture and treatment.

Best Practices

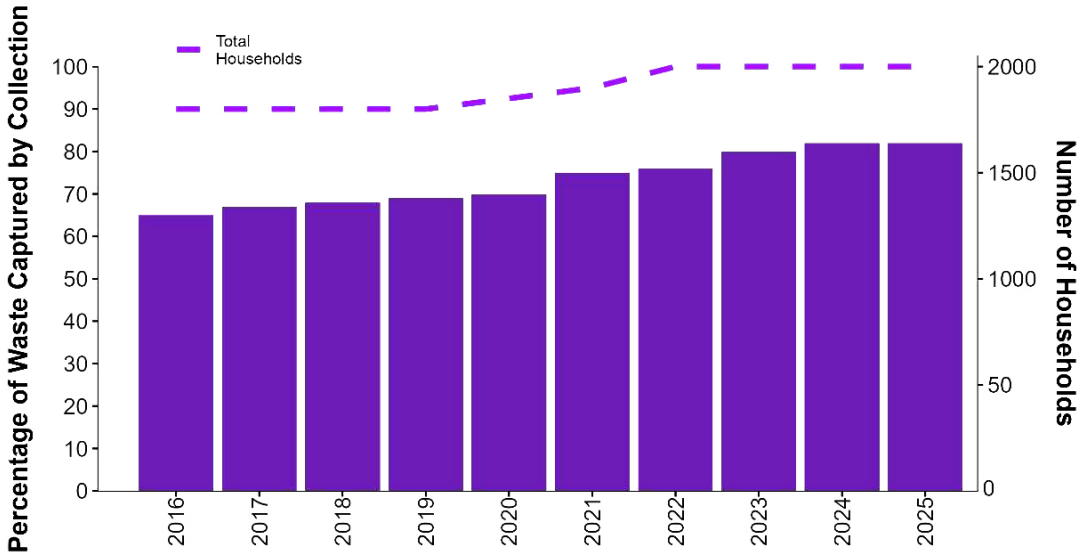
While this indicator tracks treated or removed waste, it may be very difficult to track waste that is not treated or removed due to illegal dumping, disposal, or stockpiling/storage. Absolute numbers should also be reported to understand the overall volume of hazardous waste.

Linkages to MEA and other frameworks and strategies

- → 2050 Strategy for the Blue Pacific Continent – Ocean and Environment
- → Basel, Rotterdam, and Stockholm Conventions
- → Cleaner Pacific 2025 Strategy – Goal 2: Recover resources from waste and pollutants
- → Framework for the Development of Environment Statistics 3.3.2, 5.2.5
- → Framework for Resilient Development in the Pacific 2ik
- → Kunming-Montreal Global Biodiversity Framework Goal A (i), Targets 2, 7, 10, 11
- → International Convention for the Prevention of Pollution from Ships (MARPOL)
- → Minamata Convention on Mercury
- → Pacific Coral Reef Action Plan 2021–2030 5.16
- → Pacific Islands Framework for Nature Conservation and Protected Areas 2021–2025 – Strategic Obj. 5
- → Pacific Islands Regional Marine Species Programme (PIRMSP) 2022–2026
- → Regional Waste Data Collection, Monitoring and Reporting Framework KPI 5, Supplemental KPI 4
- → SAMOA Pathway/ABAS 64–65, 70, 71
- → SDG 3.9, 6.2, 6.3, 6.A, 11.6 12.4, 12.5
- → SPREP Strategic Plan 2017–2026 Regional Objectives 3.1, 3.2, 3.3
- → Waigani Convention

INDICATOR

Household Waste Captured



Percentage of waste captured by collection services from 2016–2025. [Hypothetical data for illustrative purposes only.]

Indicator Definition

Percentage of household waste capture by authorised waste collection.

Key Terms

Household waste: waste originating from households only (excludes waste generated by the public away from home and commercial waste).

Capture rate: the proportion of total waste generated that is successfully captured and disposed of or recovered in an environmentally responsible manner. Waste capture can include: waste collected by a household collection service, waste that is self-hauled to a licensed waste disposal facility, and materials that are source separated and diverted to a recovery facility

Purpose

This indicator measures the percentage of total household waste disposed in waste facilities as a measure to reduce dumping of waste – which can impact human and environmental health.

Desired Outcome

Positive trend in household waste captured by authorised collection.

Assumptions

Assumes volumes/weights of waste are recorded at landfills and that household surveys are conducted to accurately estimate amount of total waste generated.

Calculation

Percentage of the total waste captured through formal waste management services over the total waste generated by households.

$$\frac{\sum \text{(quantity of household waste captured)}}{\sum \text{(quantity of household waste generated)}} * 100\%$$

∑ (quantity of household waste captured) = **sum of the amount of household waste that is captured by authorised waste collection.**

∑ (quantity of household waste generated) = **sum of the amount of household waste that is produced or generated.**

Hypothetical Example of Calculation

A country generates 100 Mt of household waste during the year. Authorised waste collection processes 76.8 Mt of the household waste. Therefore, the calculation for this indicator is 76.8 Mt / 100 Mt * 100% = 76.8%.

Data Sources

Household surveys conducted by national authority; household waste audits, waste management records for amount of waste, human population from national bureau of statistics.

Data Collection

Capture rate is measured by volume or weight at waste disposal facilities.

Frequency of Data Collection

Annually.

Disaggregation

Data can be disaggregated by urban and rural areas to better understand the distribution of services.

Best Practices

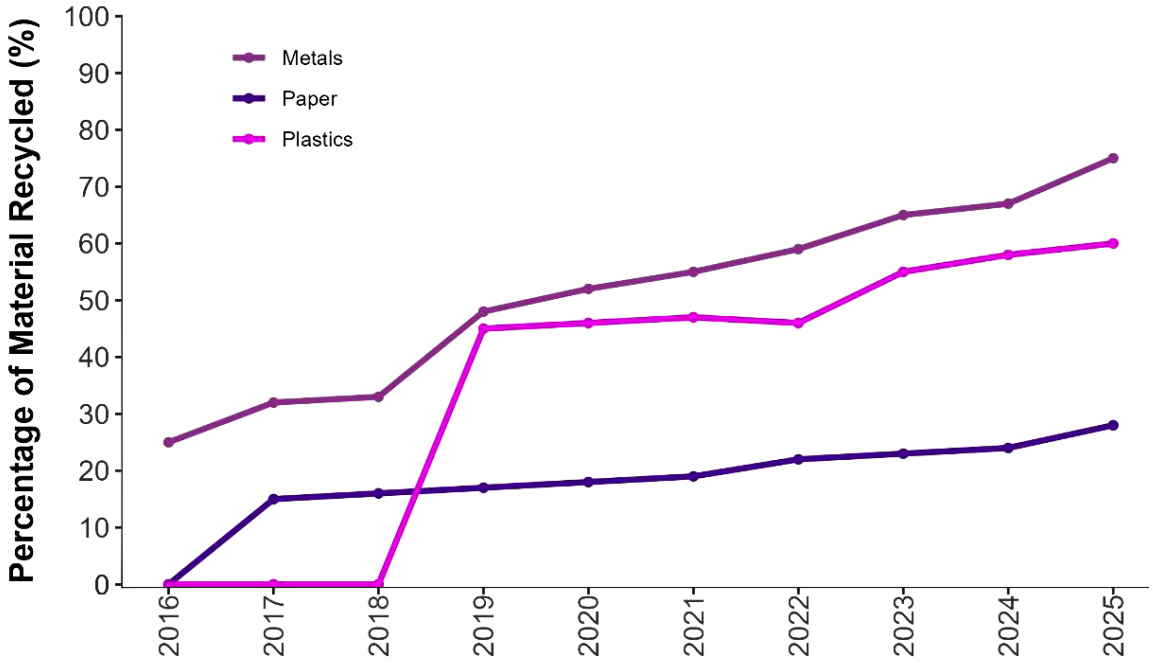
The capacity and total number of modern waste facilities and unregulated waste facilities and the household service area coverage are important drivers and pressures for discussion of this indicator (please see SPREP Regional Waste Data Collection, Monitoring and Reporting Framework KPI 1, 2, and 7). Understanding the status of these factors are important for assessing both the current state and trend of the indicator and are essential for recommendations for improvement. Since the number of households affects the percentage of waste collected, absolute values for the number of households need to be reported. Absolute values for household waste generation are also useful for assessing this indicator and may be captured in the Per Capita Generation of Municipal Solid Waste REI in this guidebook. This indicator may also be difficult to separate non-household waste from household waste if audit surveys are not set up correctly.

Linkages to MEA and other frameworks and strategies

- → 2050 Strategy for the Blue Pacific Continent – Ocean and Environment
- → Cleaner Pacific 2025 Strategy – Goals 2, 3
- → Coral Triangle Initiative
- → Framework for the Development of Environment Statistics 3.3.2, 5.1.2
- → Global Set of Climate Change Statistics and Indicators 157
- → Kunming-Montreal Global Biodiversity Framework Goal A (i), Targets 2, 7, 11, 12, 16
- → Noumea Convention
- → Pacific Coral Reef Action Plan 2021–2030 5.16
- → Pacific Islands Framework for Nature Conservation and Protected Areas 2021–2025 – Strategic Obj. 5
- → Pacific Islands Regional Marine Species Programme (PIRMSP) 2022–2026
- → Regional Waste Data Collection, Monitoring and Reporting Framework KPI 1, 2, 3, 6, 7,
- → Supplemental KPIs 1, 2, 3, 6, 7, 8, 9, 10
- → SDG 6.3, 11.6, 12.4, 14.1
- → SAMOA Pathway/ABAS – 71a
- → SPREP Strategic Plan 2017–2026 Regional Objectives 3.1, 3.2, 3.3, 3.4
- → System of Environmental-Economic Accounting for Waste Accounting
- → United Nations Convention to Combat Desertification (UNCCD)

INDICATOR

Municipal Waste Recycled



Municipal waste recycled at landfill from 2016–2025. [Hypothetical data for illustrative purposes only.]

Indicator Definition

Percentage of national solid waste recycled or average daily per capita percentage of municipal solid waste recycled.

Key Terms

Municipal solid waste: a waste type consisting of everyday items that are discarded by the public.

Purpose

This indicator tracks the percentage of municipal solid waste diverted from landfill through recycling as a measure of efforts to reduce dumping of waste that may impact human and environmental health.

Desired Outcome

Positive trend in recycling of solid waste.

Assumptions

Assumes either that the percentage of total solid waste is recorded at landfill facilities or that household waste surveys are conducted annually.

Calculation

Percentage of total solid waste volume or weight diverted from landfill facilities or collected during daily waste generation surveys.

$$\frac{\sum \text{(quantity of waste diverted from landfill)}}{\sum \text{(quantity of waste received by all waste facilities)}} * 100\%$$

∑ (quantity of waste diverted from landfill) = **sum of the amount of waste that is diverted from landfill for recycling.**

∑ (quantity of waste received by all waste facilities) = **sum of the amount of municipal solid waste that is produced or generated.**

Hypothetical Example of Calculation

A country generates 8 Mt of metal waste and 25 Mt of plastic waste every year. The waste is collected through a programme which recycles it for other uses and 3.7 Mt of the metal is treated and 14.5 Mt of plastic is treated. Therefore, the calculation for this indicator is 3.7 Mt / 8 Mt * 100% = 46.3% for metals and 14.5 Mt / 25 Mt = 58.0% for plastic waste.

Data Collection

Data should be collected across the area of interest at varying time scales to best reflect spatial and temporal variation throughout the year.

Frequency of Data Collection

Annually.

Disaggregation

Data can be disaggregated by material type to understand where recycling priorities should be targeted.

Data Sources

Household surveys conducted by national authority, waste management records for amount of waste, human population from national bureau of statistics/statistics offices.

Best Practices

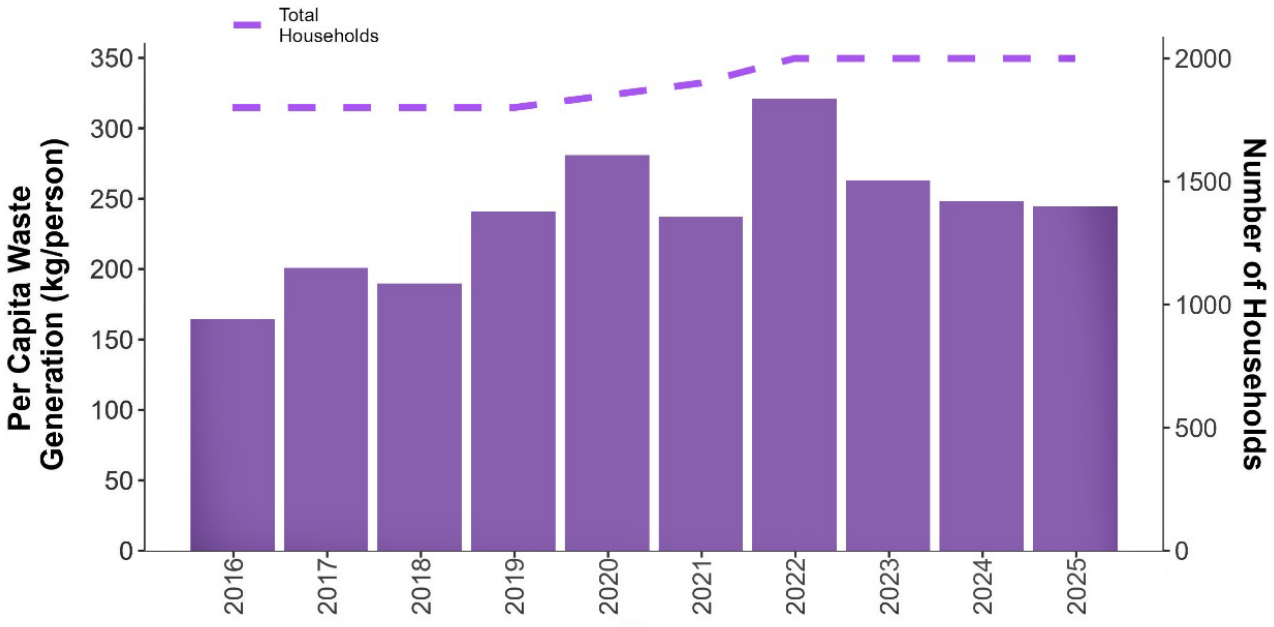
Absolute values of total waste are needed to understand how the percentages may change over time. Municipal solid waste composition (please see SPREP Regional Waste Data Collection, Monitoring and Reporting Framework KPI 5) and the per capita waste generation rate (please see SPREP Regional Waste Data Collection, Monitoring and Reporting Framework KPI 4 and REI in this guidebook) are important pieces of information for assessing this indicator as they inform the quantity of material being generated that is available for recycling.

Linkages to MEA and other frameworks and strategies

- → 2050 Strategy for the Blue Pacific Continent – Ocean and Environment
- → Cleaner Pacific 2025 Strategy – Goal 2
- → Framework for the Development of Environment Statistics 3.3.2
- → Framework for Resilient Development in the Pacific
- → Kunming-Montreal Global Biodiversity Framework Target 7
- → Noumea Convention
- → Pacific Islands Framework for Nature Conservation and Protected Areas 2021–2025 – Strategic Obj. 5
- → Regional Waste Data Collection, Monitoring and Reporting Framework KPI 3, 4, and 5
- → SAMOA Pathway/ABAS – 71 a, d
- → SDG 11.6, 12.4, 12.5
- → SPREP Strategic Plan 2017–2026 Regional Objectives 3.1, 3.3
- → Waigani Convention

INDICATOR

Per Capita Generation of Municipal Solid Waste



Annual per capita waste generation from municipal solid waste from 2016–2025.
[Hypothetical data for illustrative purposes only.]

Indicator Definition
Annual per capita generation of municipal solid waste.

Key Terms
Municipal solid waste: a waste type consisting of everyday items that are discarded by the public.

Purpose
This indicator addresses the need for accurate measurement of per capita waste generation for improved waste management and tracking of consumption patterns.

Desired Outcome
Stable or negative trend in generation of solid waste.

Assumptions
Assumes sufficient annual sampling of per-capita waste generation.

Calculation
Amount of waste generated per person (kg) during the sampling period times the conversion to report at an annual rate.

$\sum$ (waste collected over period) = **sum of the amount of household waste that is collected per household.**

people per household = **number of people per household, usually collected from community or census surveys.**

days in sampling period = **number of days in the sampling period.**

Hypothetical Example of Calculation

A household waste generation survey measures 250 kg of waste from 100 households over a seven day period, which is 250 /100 or 25 kg of waste per household over the seven days. A community survey indicates that there are an average of 4.2 people per household. Therefore, the calculation for this indicator is (25 kg / (4.2 people * 7 days)) * 365 days = 310.4 kg of waste per person per year.

Data Sources

Household surveys conducted by national authority or national authority partner (e.g. JICA), national statistical offices.

Data Collection

Representative sampling of households using daily waste separation should be collected over a minimum two-week period and then calculated to the annual rate. Data should be collected over the area of interest at varying times of the year to account for spatial and temporal variability.

Frequency of Data Collection

Annually.

Disaggregation

Data can be disaggregated by urban and rural areas to better understand waste generation patterns.

Best Practices

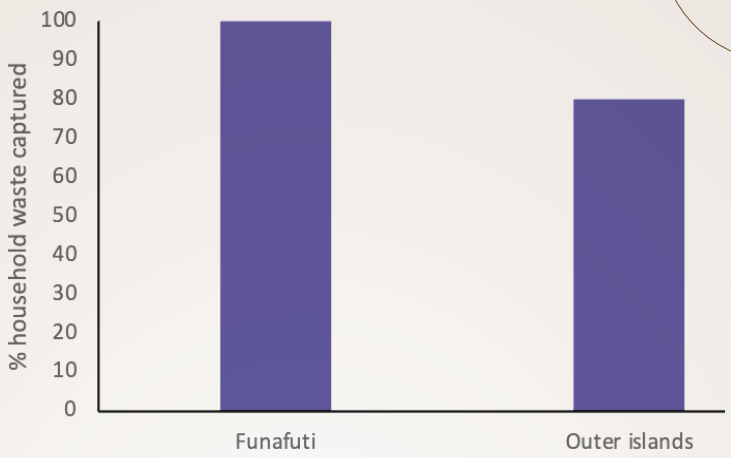
Solid waste generated could be broken down further into types of waste to better understand which types could be recycled and to focus priorities for waste management. Municipal solid waste composition (please see SPREP Regional Waste Data Collection, Monitoring and Reporting Framework KPI 5) provides a basis for assessing the composition of generated waste.

Linkages to MEA and other frameworks and strategies

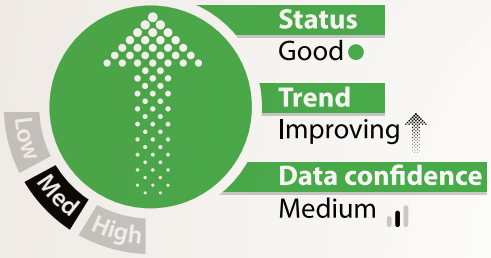
- → 2050 Strategy for the Blue Pacific Continent – Ocean and Environment
- → Cleaner Pacific 2025 Strategy – Goal 1
- → Framework for the Development of Environment Statistics 3.3.1
- → Framework for Resilient Development in the Pacific 2ik
- → Global Set of Climate Change Statistics and Indicators 156
- → Kunming-Montreal Global Biodiversity Framework Goal A (i), Targets 2, 7, 16
- → Noumea Convention
- → Pacific Islands Framework for Nature Conservation and Protected Areas 2021–2025 – Strat. Obj. 5
- → Regional Waste Data Collection, Monitoring and Reporting Framework KPI 4, 5
- → SAMOA Pathway/ABAS – 71a, 71d
- → SDG 6, 11.6, 12.4
- → SPREP Strategic Plan 2017–2026 Regional Objectives 3.1, 3.2, 3.3, 3.4
- → System of Environmental-Economic Accounting for Waste Accounting

INDICATOR IN ACTION

TUVALU WASTE COLLECTION



Percentage of households with waste collection in Funafuti and outer islands, Tuvalu.



The responsibility for household waste collection in Tuvalu is held by the Department of Waste Management in Funafuti and the Falekaupule (traditional assembly of elders) in the outer islands. Coverage is excellent in Funafuti, with 100% of households provided with waste collection services, and relatively good on the outer islands (80% of households covered). Waste is collected following a regular schedule, using flat-tray vehicles and taken directly to local landfill sites. In Fongafale, Funafuti (where most of the nation's population reside), general waste is collected twice per week, green waste is collected twice per week, and bulky waste is collected once per week. On the outer islands, waste is generally collected twice per week. Unfortunately, data are not available to determine the percentage of waste collected from the total waste generated and illegal dumping and incineration need to be addressed.

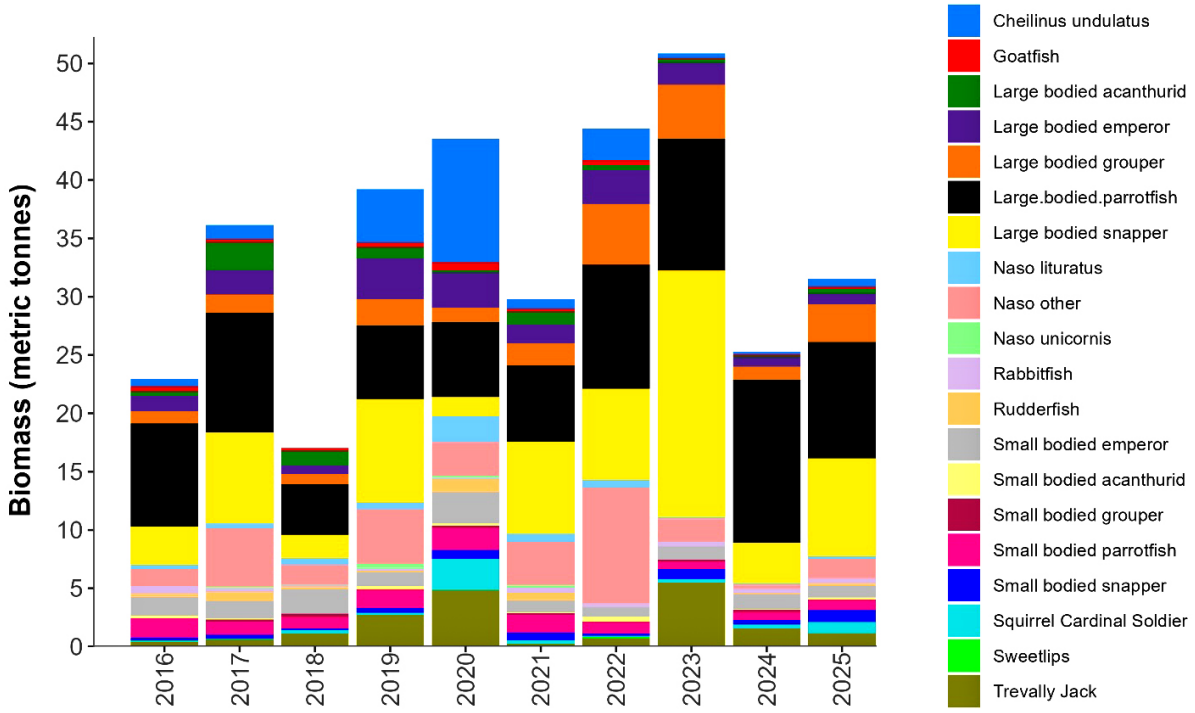
Coastal and Marine

Coastal and marine ecosystems provide important services for species and people in the Pacific islands, including wave attenuation, coastal protection, habitat for species, and food resources. The theme of **Coastal and Marine** presents a total of four indicators that are focused on tracking the health of water, biodiversity, and species that provide food resources for people:

- Coastal Fish Biomass (Inshore Fisheries)
- Lagoon Water Quality (*E. coli*)
- Live Coral Cover
- Status of Offshore Fisheries

INDICATOR

Coastal Fish Biomass (Inshore Fisheries)



Biomass of Reef Fish from 2016–2025. [Hypothetical data for illustrative purposes only.]

Indicator Definition

Biomass of inshore fish populations.

Key Terms

Biomass: the total quantity or weight of organisms in a given area or volume.

Purpose

Inshore reef fish population status and biomass are correlated with reef health and healthy fisheries. This indicator uses biomass as a proxy for assessing fish populations and reef habitat.

Desired Outcome

Stable level of biomass; or juvenile fish are not overrepresented in markets.

Assumptions

Assumes that fisheries independent data are available for assessing population and fisheries dependent data used to indicate pressure.

Calculation

Biomass can be calculated by the total mass of fish sampled or total number of fish multiplied by the average mass of fish sampled.

$$\frac{\sum \text{(biomass of fish)}}{\text{total number of fish}} * \text{total population size}$$

$\sum$ (biomass of fish) = sum of the mass for fish sampled.
total number of fish = number of fish sampled.
total population size = estimated number of fish in population.

Hypothetical Example of Calculation

A country's fisheries ministry samples 30 individuals of a reef fish species and the combined weight of the sample is 16.4 kg. The estimated population of the species is approximately 10,000 individuals. The calculation for this measure would be (16.4 / 30) * 10,000, which is equal to 5,466.7 kg or 5.47 Mt.

Data Sources

Fisheries ministry, The Pacific Community (SPC),
Fisheries in the economies of Pacific Island countries and territories (Benefish Study 4)
(https://fame.spc.int/resources/documents/fisheries-economies-pacific-island-countries-and-territories).

Data Collection

Fisheries independent data (biomass) need to be sampled at the same location across a variety of habitats every year. Fisheries dependent data can be collected from creel surveys or fish markets.

Frequency of Data Collection

Annually.

Disaggregation

Data can be further disaggregated by island, fish size class, or fishing method to better understand the distribution of fisheries.

Best Practices

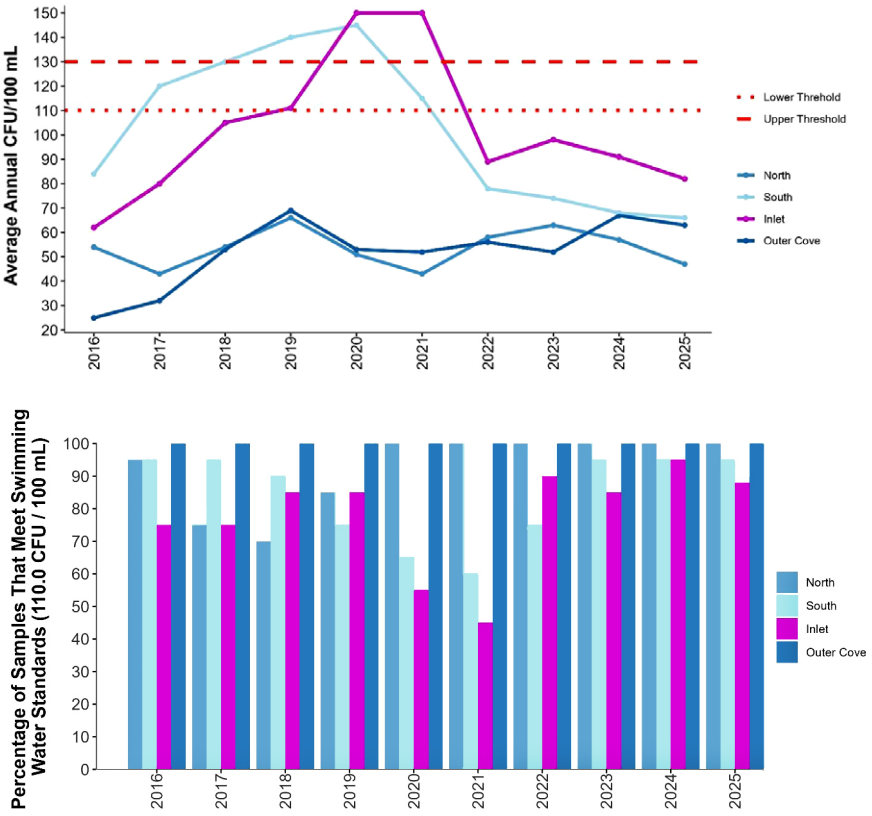
Annual catch per unit effort (CPUE) or catch (mass) of inshore species should be included as a pressure to inshore fisheries health. Example measurements include: number of fish per fisher per hour fished (No/F/Hr); mass (kg) of fisher per fisher per hour fished; or mass (kg or tons) of raw captures. Traditional knowledge can provide important information on the status and trend of this indicator, particularly in the form of historical evidence and data for species patterns and relative abundance.

Linkages to MEA and other frameworks and strategies

- → 2050 Strategy for the Blue Pacific Continent – Resources and Economic Development, Climate Change and Disasters, Ocean and Environment
- → A New Song for Coastal Fisheries – Pathways to Change: The Noumea Strategy
- → Coral Triangle Initiative
- → Framework for the Development of Environment Statistics 2.5.2
- → Future of Fisheries: A Regional Roadmap for Sustainable Pacific Fisheries
- → Kunming-Montreal Global Biodiversity Framework Goal B (iii, vi), Targets 5, 9, 10, 16
- → Pacific Coral Reef Action Plan 2021–2030 7.1, 7.2, 7.4, 7.5
- → Pacific Framework for Action on Scaling up Community-based Fisheries Management: 2021–2030
- → Pacific Islands Framework for Nature Conservation and Protected Areas 2021–2025 – Strategic Objectives 2, 4, 5
- → SAMOA Pathway/ABAS – 53, 58, 59, 63, 90
- → SDG 2.4, 6.3, 6.6, 14.4, 14.7
- → Sendai Framework for Disaster Risk Reduction C-2
- → SPREP Strategic Plan 2017–2026 Regional Goals 2.1 and 2.2

INDICATOR

Lagoon Water Quality (E. coli)



Lagoon Water Quality Samples across sites from 2016–2025. [Hypothetical data for illustrative purposes only.]

Indicator Definition

Enterococci levels across lagoon monitoring sites.

Key Terms

Enterococci: facultative anaerobic bacteria in short and medium chains, which cause difficult-to-treat infections that are found in wastewater treatment plant effluent, leaking septic systems, stormwater runoff, sewage discharged or dumped from recreational boats, domestic animal and wildlife waste, improper land application of manure or sewage and runoff from manure storage areas.

Purpose

Enterococci are indicators of faecal contamination in coastal waters and are associated with a range of possible human diseases. High levels of E. coli can also be associated with cloudy water and decreased dissolved oxygen.

Desired Outcome

Enterococci levels are within the safe threshold for marine recreation at all monitored sites. Current United States EPA thresholds are <110–130 CFU/100 ml per sample. The World Health Organisation (WHO) has a threshold of 140 Enterococci per 100 millilitres which corresponds roughly to 250 faecal coliform per 100 millilitres.

Assumptions

Assumes laboratory facilities are available and sufficient water sampling at key sites across the country.

Calculation

Colony forming units (CFU) per 100 ml in laboratory analysis.

$$\frac{\sum (\text{CFU})}{100\text{ml}} * 100\%$$

∑ (CFU) = the sum of the number of colony forming units (CFU) within a sample.

Percentage of water samples under 100 CFU per 100 ml.

$$\frac{\sum (\text{samples under thresholds})}{\text{number of samples}} * 100\%$$

∑ (samples under thresholds) = number of water samples that contain total amounts of colony forming units (CFU) under the health threshold.

number of samples = total number of water samples collected.

Hypothetical Example of Calculation

A water sample is collected and the laboratory analysis shows that there are 90 CFU per 100 ml. This sample is under the 100 CFU/100 ml threshold.

A site has 52 water samples (collected once a week) and 45 samples have CFU under 100 CFU/100 ml. The calculation of water samples under 100 CFU per 100 mL would be 45 / 52 * 100% = 86.5%.

Data Sources

Environment or water resource ministries, Global Pollution Watch (available 2026).

Data Collection

Samples should be collected at frequent intervals and at multiple sites to provide the best spatial and temporal coverage. For bathing water directives, sampling at least monthly is required since enterococci levels can change rapidly and high values are common after rain events.

Frequency of Data Collection

Daily or throughout the year, particularly after storm events which tend to cause runoff into coastal waters.

Disaggregation

Data can be presented as the average CFU over the year for each site or as the percentage of samples that are not contaminated at each site.

Best Practices

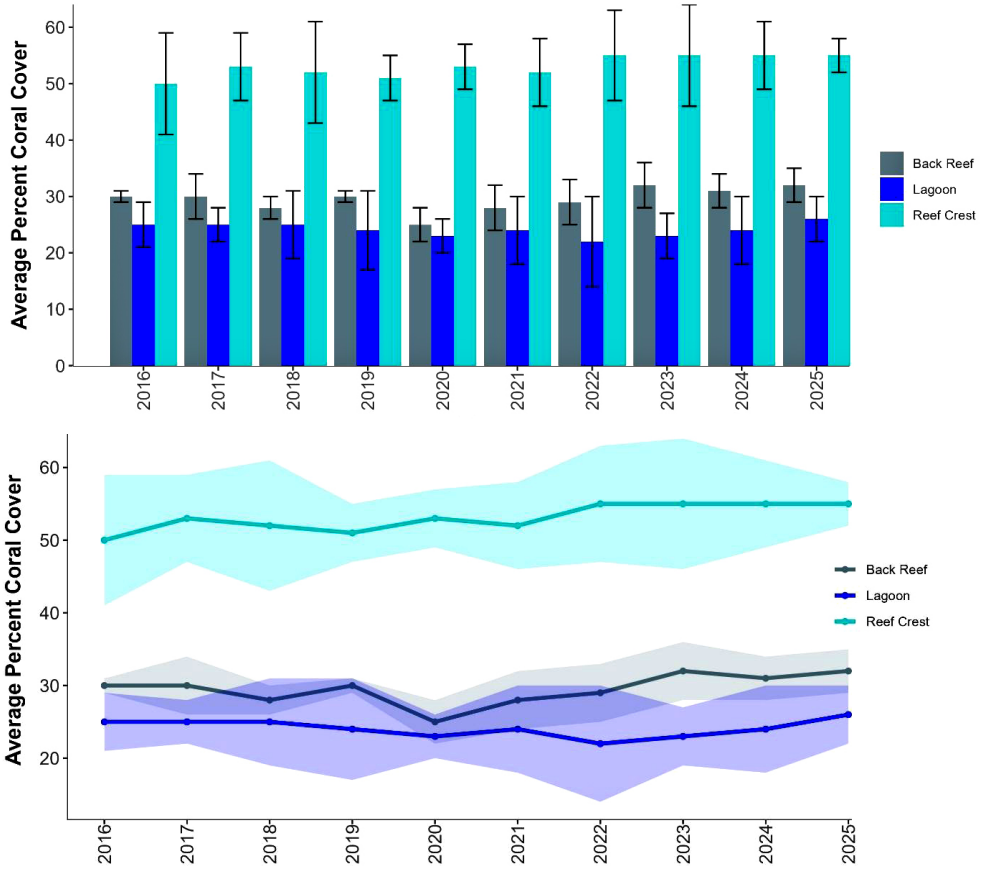
These data are not likely collected efficiently in the Pacific and methodology needs to be standardised to ensure comparisons. Tropical climate countries, as in the Pacific islands, provide conditions that allow enterococci that are occurring in the environment to multiply and these loads may not be directly linked to wastewater discharge. Discussion should also include whether water quality monitoring data, reports, or results are made available to the public to assess the availability and accessibility of key environmental information to the public.

Linkages to MEA and other frameworks and strategies

- → 2050 Strategy for the Blue Pacific Continent – Ocean and Environment
- → Cleaner Pacific 2025 Strategy – Goals 3 and 4
- → Framework for the Development of Environment Statistics 1.2.2, 1.3.3, 3.2.3
- → Framework for Resilient Development in the Pacific 2ik
- → Kunming-Montreal Global Biodiversity Framework Goals A (i), B (iii), Targets 2, 7, 10, 11
- → International Convention for the Prevention of Pollution from Ships (MARPOL)
- → Noumea Convention
- → Pacific Coral Reef Action Plan 2021–2030 5.16, 6.1
- → Pacific Islands Framework for Nature Conservation and Protected Areas 2021–2025 – Strategic Obj. 5
- → SAMOA Pathway/ABAS – 64–65
- → SDG 6.3, 6.6, 14
- → SPREP Strategic Plan 2017–2026 Regional Objectives 2.1, 2.2, 3.1, 3.2, 3.4

INDICATOR

Live Coral Cover



Live coral cover across sites from 2016–2025. [Hypothetical data for illustrative purposes only.]

Indicator Definition

Percentage of live coral cover in coastal and marine environments.

Key Terms

Live coral: percentage of a reef's surface that is covered by living, healthy coral colonies.

Purpose

Live coral cover serves as an indicator of healthy coral reef systems, which are associated with a range of environmental values and ecosystem services.

Desired Outcome

Stable or increasing trend in live coral cover.

Assumptions

Adequate resources are available to undertake coral sampling at a representative suite of nearshore and offshore sites.

Calculation

Percentage of sample area that is covered in live coral cover.

$$\text{Average}\left(\frac{\text{area of live coral cover}}{\text{area of plot}}\right) * 100\%$$

area of live coral cover = area of live coral cover measured within a monitoring plot.

area of plot = the size of the monitoring plot.

Hypothetical Example of Calculation

A country's fisheries ministry collects data at five coral monitoring plots at a site. Each monitoring plot is 5 metres by 5 metres (25 sq. m). The ministry measures the cover of the live coral within each of the plots and gets the following measurements: 10.8 sq. m, 7.3 sq. m, 13.4 sq. m, 20.4 sq. m, 2.8 sq. m. The calculation for this indicator would be ((10.8 / 25) + (7.3 / 25) + (13.4 / 25) + (20.4 / 25) + (2.8 / 25)) / 5 *100 = 43.8%.

Data Sources

Environment or fisheries ministries, universities and research institutions,

Status and Trends of Coral Reefs in the Pacific (Status and Trends of Coral Reefs of the Pacific: 1980–2023), Global Coral Reef Monitoring Network (https://gcrmn.net/pacific/), Micronesia Coral Monitoring (https://micronesiareefmonitoring.com/).

Data Collection

Coral cover is usually measured along fixed distance transects using a tape underwater or estimated within underwater plots over time. The transects should have adequate cover across the area of interest to ensure that they are representative of the area. There are new tools (e.g., ReefCloud, MERMAID, CoralNet) that use artificial intelligence technology to allow rapid calculation of live coral cover from reef photos.

Frequency of Data Collection

Sites should be monitored annually.

Disaggregation

Data can be disaggregated by island or geomorphic feature to better coral cover and distribution.

Best Practices

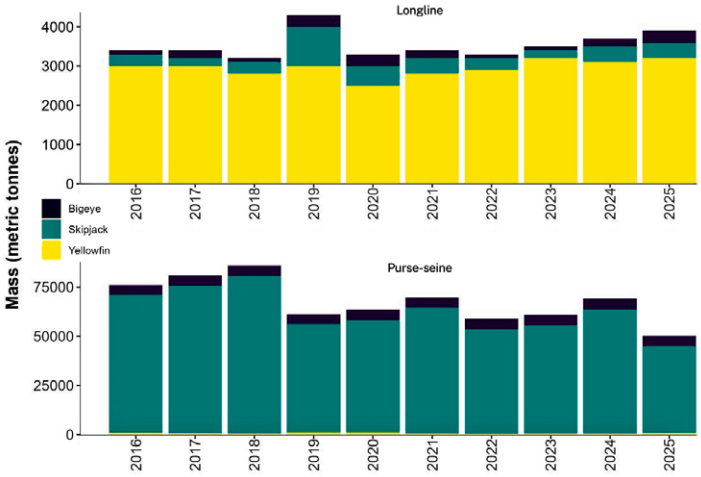
Trend can also discuss rate of coral loss due to bleaching events or discuss increase due to restoration efforts. Loss due to crown of thorns (a predator of coral), marine invasive species, diseases, physical damage (e.g. tramping, wave action from cyclones), and stony tissue loss should also be discussed where relevant. Other causes of loss may be due to increases in macroalgae cover, which can smoother corals or compete for resources and may be linked to chemical water quality/eutrophication. Live coral cover can be severely impacted by acute natural and climate-related disturbance and take decades to recover even under good management practices.

Linkages to MEA and other frameworks and strategies

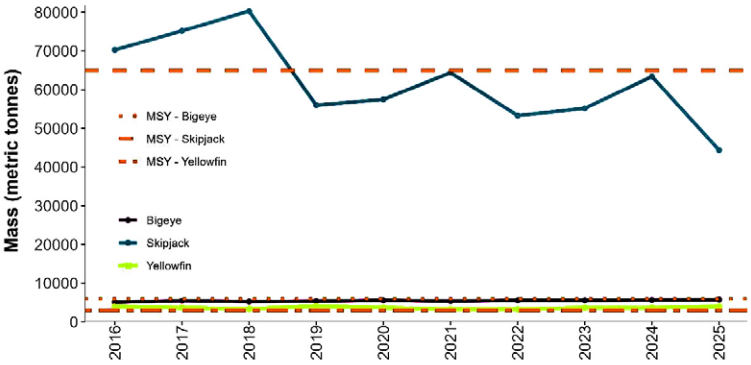
- → 2050 Strategy for the Blue Pacific Continent – Climate Change and Disasters, Ocean and Environment
- → Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)
- → Framework for the Development of Environment Statistics 1.3.3
- → Framework for Resilient Development in the Pacific 2if
- → Kunming-Montreal Global Biodiversity Framework Goals A (i, ii, iii, iv, vii, viii), B (iii), Targets 1, 2, 4, 5, 10
- → Pacific Bioscapes Logframe
- → Pacific Coral Reef Action Plan 2021–2030 1.5, 4.2, 5.16, 6.6, 6.7, 6.9, 8.2, 8.3, 8.4
- → Pacific Islands Regional Marine Species Programme (PIRMSP) 2022–2026
- → Pacific Islands Framework for Nature Conservation and Protected Areas 2021–2025 – Strategic Obj. 2
- → Ramsar Convention on Wetlands
- → SAMOA Pathway/ABAS – 90
- → SDG 6, 14.2, 14.5
- → Sendai Framework for Disaster Risk Reduction C-2
- → SPREP Strategic Plan 2017–2026 Regional Objectives 2.1, 2.2

INDICATOR

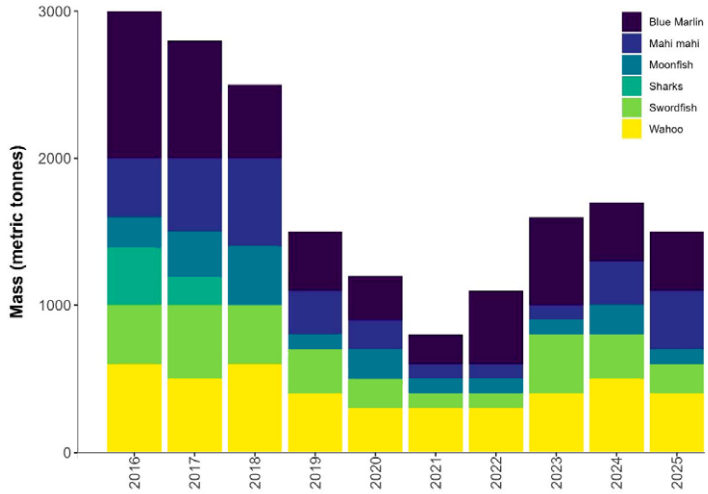
Status of Offshore Fisheries



Biomass of tuna species harvested from 2016–2025 by operation type.
[Hypothetical data for illustrative purposes only.]



Biomass of tuna species harvested from 2016–2025 in relation to maximum sustainable yield thresholds.
[Hypothetical data for illustrative purposes only.]



Biomass of bycatch harvested during tuna operations from 2016–2025.
[Hypothetical data for illustrative purposes only.]

Indicator Definition

Annual catch (biomass) of tuna species.

Key Terms

Maximum sustainable yield: the largest yield (or catch) that can be taken from a species' stock over an indefinite period to ensure sustainable populations.

Maximum economic yield: level of catch that provides the maximum net economic benefits or profits to society on a sustainable basis.

Purpose

This indicator tracks the health of commercially targeted migratory fish species and impact of by-catch on non-target species which are important food and income resources for Pacific island countries.

Desired Outcome

Stable trend in annual catch that is also within maximum sustainable yields or maximum economic yields.

Assumptions

Assumes catch records are available or can be recorded. This indicator does not account for interannual variation driven by climate.

Calculation

Total mass of annual catch per target species.

$$\sum \text{(biomass)} = \text{sum of the mass of fish.}$$

Hypothetical Example of Calculation

A country's fisheries ministry reports 3,452 Mt of yellowfin tuna and 32.5 Mt of bigeye tuna were harvested during the year. The direct numbers would be reported as the metric for this indicator.

Data Sources

Fisheries ministry, The Pacific Community (SPC) regional assessments (https://fame.spc.int/documents/key-spc-fame-publications), Pacific Islands Forum Fisheries Agency (https://www.ffa.int/publications-and-statistics/statistics/), Fisheries in the economies of Pacific Island countries and territories (Benefish Study 4) (https://fame.spc.int/resources/documents/fisheries-economies-pacific-island-countries-and-territories).

Data Collection

Data should be available from regional fish assessments which indicate levels of confidence (standard deviations, etc.). Data may also be available from fish markets and fishing vessel observation networks.

Frequency of Reporting

Annually.

Disaggregation

Data can be further disaggregated by fishing method to better understand the distribution of catch and potential impacts on the ecosystem.

Best Practices

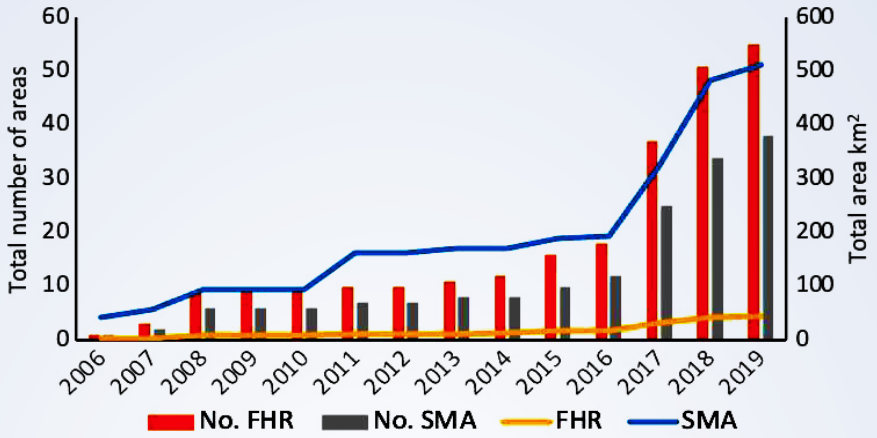
Data should include target species and by-catch when relevant. Annual catch can be compared to maximum sustainable yields and maximum economic yields to understand where or when overharvest may occur. Other useful visualisations include using a Kobe or Majuro plot where the status of key tuna stocks is displayed in terms of biomass depletion relative to unfished spawning biomass or to spawning stock biomass capable of producing maximum sustainable yield (SSBMSY), while fishing mortality remains relative to fishing that maintains maximum sustainable yield (FMSY).

Linkages to MEA and other frameworks and strategies

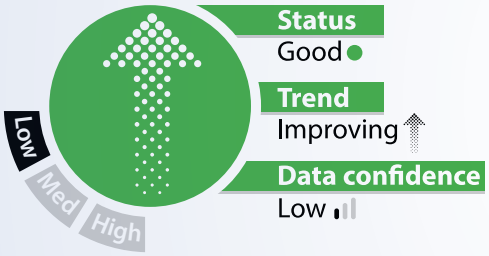
- → 2050 Strategy for the Blue Pacific Continent – Resources and Economic Development, Climate Change and Disasters, Ocean and Environment
- → Convention for the Conservation and Management of Highly Migratory Fish Stocks in the Western and Central Pacific Ocean
- → Coral Triangle Initiative
- → Framework for the Development of Environment Statistics 2.5.2
- → Future of Fisheries: A Regional Roadmap for Sustainable Pacific Fisheries
- → Kunming-Montreal Global Biodiversity Framework Goal B (iii, vi), Targets 5, 9, 10. 16
- → Pacific Islands Framework for Nature Conservation and Protected Areas 2021–2025 – Strategic Obj. 5
- → SAMOA Pathway/ABAS – 53, 58, 59, 63, 69, 90
- → SDG 2.4, 14.4, 14.7, 14.c

INDICATOR IN ACTION

TONGA'S SPECIAL MANAGEMENT AREAS (INSHORE FISHERIES)



Growth of Tonga's Special Management Area programme, including Special Management Areas (SMAs) and no-take Fish Habitat Reserves (FHRs).



Tonga's Special Management Area (SMA) programme was introduced to provide greater community ownership of inshore fisheries and coastal marine protected areas. SMAs grant communities exclusive access to the marine environment adjacent to their village to a depth of the 50 metre contour or 2.5 km from shore and only registered members of the community are permitted to fish in this area. A subset of each SMA is designated as no-take Fish Habitat Reserve (FHR). The size and boundaries of FHRs are determined by the Ministry of Fisheries in consultation with communities. Management and enforcement of SMAs is the responsibility of each community and this includes a requirement for developing a coastal management committee and associated management plan. From 2016–2019 31 new SMAs were established and a further 46 SMAs have been confirmed or approved. The overall goal is to include all coastal communities in the programme by 2025. Tonga's SMAs are a model programme for community managed inshore fisheries and coastal marine protected areas.

The highly successful SMA programme in Tonga gained support from FAO through EConnect to develop a new SMA Manual in 2022. The SMA manual discusses processes to assist staff in establishing, implementing, and monitoring SMAs.

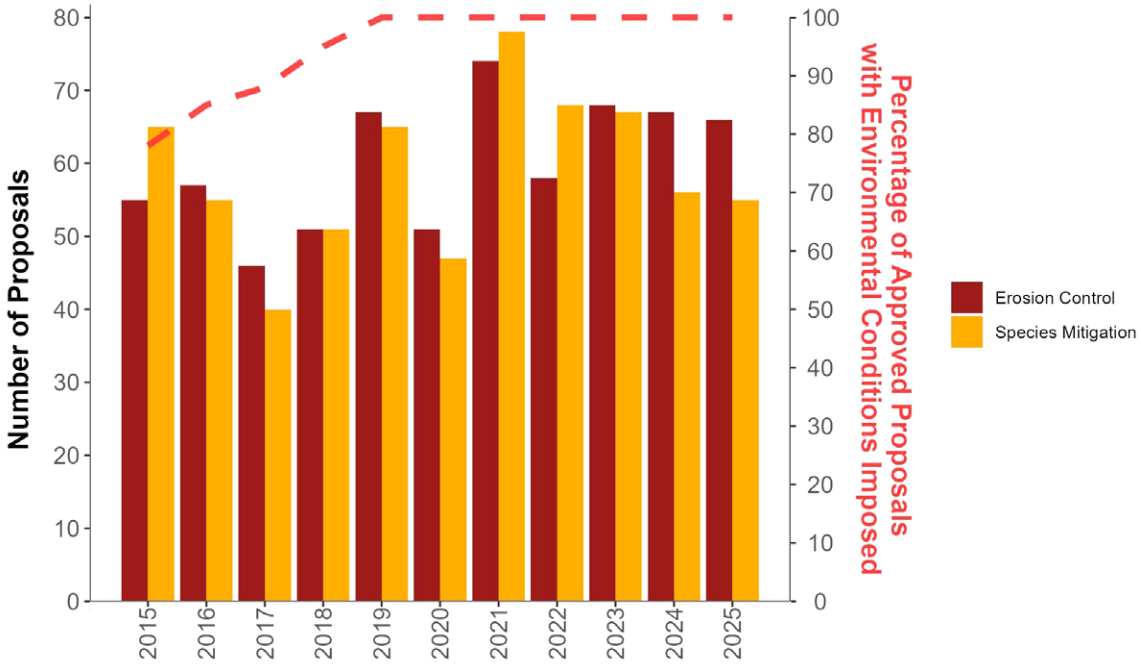
Environmental Governance

Understanding the health of the environment is critical for environmental monitoring but there is a need to also track the effectiveness of policies, practices, and processes that regulate human-environment interactions and natural resources management. The theme of **Environmental Governance** presents a total of five indicators that are focused on tracking compliance, enforcement, funding, capacity, and equity of policy and decision-making processes:

- Approved Development Proposals with Conditions
- Environmental Enforcement
- Environment Ministry Budget Allocation
- Multilateral Environment Agreements Reporting Requirements
- Women in Environmental Leadership

INDICATOR

Approved Development Proposals with Conditions



Development permits approved with conditions from 2016–2025. [Hypothetical data for illustrative purposes only.]

Indicator Definition

Percentage of approved development proposals with environmental conditions imposed.

Key Terms

Environmental compliance: the act of conforming to environmental laws, regulations, standards and other requirements such as site permits to operate.

Purpose

Development projects pose unique threats to species and the environment in the form of soil erosion, pollution, habitat conversion, direct displacement of species, and other impacts. This indicator measures the effectiveness of the national development assessment process in regards to environmental compliance.

Desired Outcome

100% of approved development proposals with conditions.

Assumptions

Assumes ministry collects data on development proposals and compliance with conditions.

Calculation

Percentage of development proposals with approved conditions in relation to the total number of approved development proposals.

$$\frac{\sum \text{(proposals with conditions)}}{\text{number of proposals}} * 100\%$$

∑ (proposals with conditions) = **the sum of number of approved development proposals within the year that have environmental compliance conditions imposed.**

∑ (number of proposals) = **the sum of the number of approved development proposals received within the year.**

Hypothetical Example of Calculation

A country receives a total of 49 development proposals. After review of the proposals, all are approved and 38 have environmental compliance conditions included in the approval. The calculation for this indicator would be 38 / 49 * 100% = 77.6%.

Data Sources

Environment ministry, government permitting and monitoring databases.

Data Collection

Data should be available directly from the environmental and enforcement ministries. However, different agencies may impose conditions and these would need to be consolidated/combined for reporting.

Frequency of Data Collection

Annually.

Disaggregation

Data can be disaggregated by sector (commercial, residential, industrial), geographic area (urban vs. rural), or condition type (species mitigation, erosion control).

Best Practices

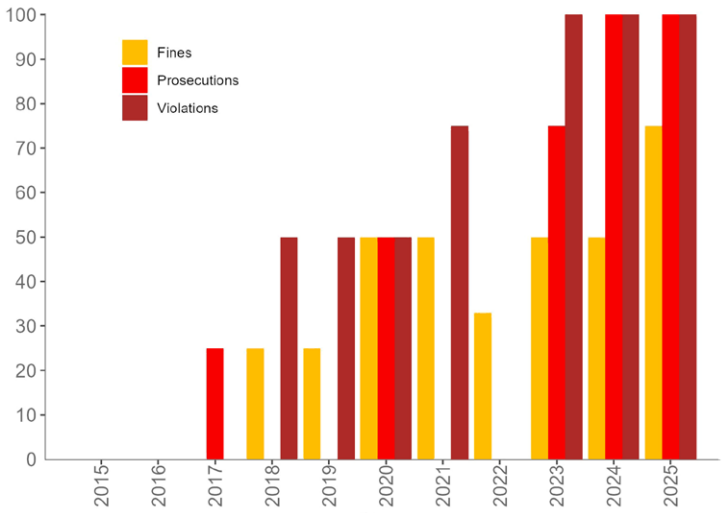
Total number of permits approved should also be reported to provide context on the development pressure of the area of interest. Discussion should also include whether environmental impact assessment reports for major projects are made available to the public to assess the availability and accessibility of key environmental information to the public. This indicator is related to the Environmental Enforcement REI and there should be discussion on whether proposal/permit conditions are specific, measurable, achievable, relevant, and time-bound (SMART). If conditions are vague, the conditions will not ensure environmental compliance and may not be enforceable.

Linkages to MEA and other frameworks and strategies

- → Agreement under the United Nations Convention on the Law of the Sea on the Conservation and Sustainable Use of Marine Biological Diversity of Areas beyond National Jurisdiction (BBNJ)
- → Framework for the Development of Environment Statistics 1.1.4, 1.2.2, 1.3.2, 1.3.3
- → Kunming-Montreal Global Biodiversity Framework Goals A, B, Target 14
- → Noumea Convention
- → Pacific Islands Framework for Nature Conservation and Protected Areas 2021–2025 – Strategic Obj. 4, 5
- → Rio Declaration on Environment and Development
- → SAMOA Pathway/ABAS
- → SDG 11.4, 11,6, 11.a, 11.b, 12.2, 12.b
- → SPREP Strategic Plan 2017–2026 Regional Objective 4.1 and 4.2

INDICATOR

Environmental Enforcement



Environmental inspections, reports and legal cases with enforcement actions from 2016–2025.
[Hypothetical data for illustrative purposes only.]

Indicator Definition

Percentage of compliance inspections, reported environment violations, and environmental legal cases that are prosecuted or enforced, resulting in violation notices, fines or punishments.

Key Terms

Environmental compliance: the act of conforming to environmental laws, regulations, standards and other requirements such as site permits to operate.

Purpose

Effective enforcement of environmental laws and policies and environmental compliance are critical processes to ensuring that development and other operations minimise impacts to species and the environment. This indicator measures the country's ability to enforce and apply existing laws to environmental infractions.

Desired Outcome

Increasing or stable percentage of cases prosecuted or enforced.

Assumptions

Prosecution procedures and enforcement of environment laws are properly carried out, and the number of fines, violations, and prosecutions is collected by relevant agencies and made publicly available.

Calculation

Annual number of legal cases with convictions or other successful legal outcomes, number of violation notices or warnings, and number of environmental fines divided by the total number of cases prosecuted, compliance inspections, and reported violations.

$$\frac{\sum(\text{cases with convictions + violation notices + fines})}{\sum(\text{cases prosecuted + compliance inspections + reported violations})} * 100\%$$

∑ (cases with convictions + violation notices + fines) = **the sum of the number of legal cases with convictions or other successful legal outcomes, number of violation notices or warnings, and number of environmental fines.**

∑ (cases prosecuted + compliance inspections + reported violations) =
the sum of the number of cases prosecuted, compliance inspections, and reported violations.

Hypothetical Example of Calculation

In a given year, there are four legal cases, 100 compliance inspections, and 200 reported violations for environmental compliance within a country. Of the four legal cases, one results in an actual prosecution. Of the 100 compliance inspections, eight result in violations and/or fines. Of the 200 reported violations, there are 130 that result in fines. The calculation for this indicator would be (1 + 8 + 130) / (4 + 100 + 200) * 100% = 45.7%.

Data Sources

Environment ministry, judicial ministry, international NGOs.

Data Collection

Data may need to be collected from multiple agencies. This indicator needs the annual numbers for the following components:

1. number of compliance inspections conducted
2. number of violation notices and warnings
3. number of administrative fines collected
4. number of environmental cases prosecuted
5. number of convictions or other legal outcomes

Frequency of Data Collection

Annually.

Disaggregation

Data can be disaggregated by infraction type, environmental impact, or sector (mining, forestry, development) to better understand which areas are being successfully enforced or may need additional attention. Data can also be disaggregated by administrative enforcement (fines, prosecution, etc.) and geographic region to better understand where enforcement capacity needs to be increased (e.g. where there are areas of high rates of infractions).

Best Practices

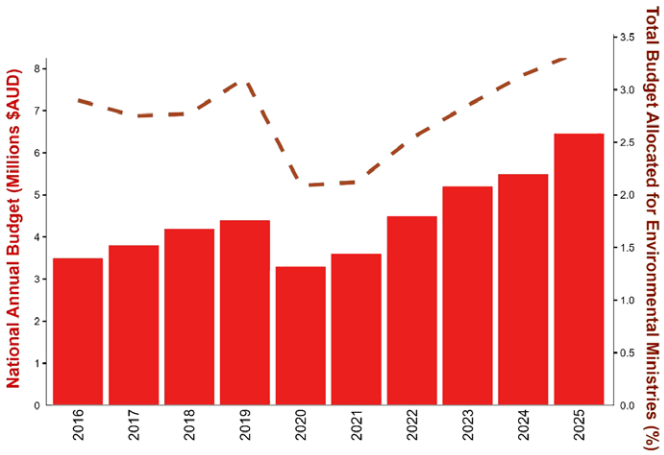
Absolute numbers need to be reported to understand how percentages change over time. Discussion should include the annual monetary amount of fines collected and the outcome of legal actions. Discussion should also include whether environmental enforcement actions are made public to assess the availability and accessibility of key environmental information to the public. While the assumption is that increased enforcement will result in lower numbers of reported infringements, there is a likely correlation between enforcement effort and the number of reported infringements (increased enforcement can result in more reports and no enforcement can result in no reported infringements) that has the potential to bias this indicator. This indicator is related to the Approved Development Proposals with Conditions REI and there should be discussion on whether development permit conditions are specific, measurable, achievable, relevant, and time-bound (SMART). If conditions are too vague, they will not ensure environmental compliance and may not be enforceable.

Linkages to MEA and other frameworks and strategies

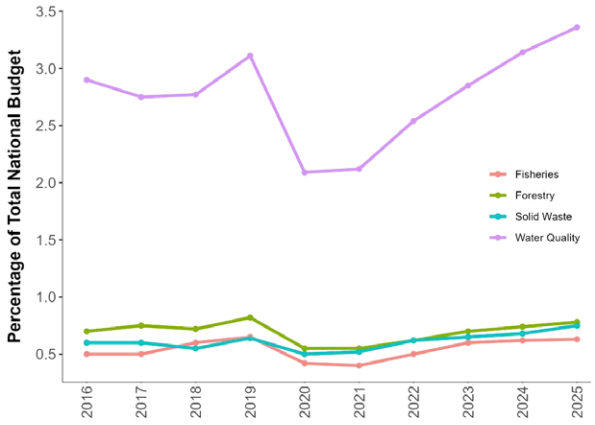
- → 2050 Strategy for the Blue Pacific Continent – Peace and Security
- → Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)
- → Framework for the Development of Environment Statistics 1.1.4, 1.2.2, 1.3.2, 1.3.3, 2.5.5
- → Kunming-Montreal Global Biodiversity Framework Goals A, B, Targets 4, 5, 9, 14
- → Noumea Convention
- → Pacific Islands Framework for Nature Conservation and Protected Areas 2021–2025 – Strategic Obj. 4, 5
- → Rio Declaration on Environment and Development
- → SAMOA Pathway/ABAS
- → SDG 11.4
- → SPREP Strategic Plan 2017–2026 Regional Objective 4.2

INDICATOR

Environment Ministry Budget Allocation



Percentage of total national budget allocated to environmental ministries from 2016–2025.
[Hypothetical data for illustrative purposes only.]



Percentage of total national budget allocated to environmental ministries and sectors from 2016–2025.
[Hypothetical data for illustrative purposes only.]

Indicator Definition

Percentage of national budget allocated to Environment Ministry or equivalent.

Key Terms

Budget: an estimate of income and expenditure for a set period of time.

Purpose

This indicator tracks trends in prioritisation of environmental funding within government as a proxy measurement of capacity for conducting environmental monitoring and reporting.

Desired Outcome

Stable or positive trend; sufficient and sustainable financing to implement environment programmes.

Assumptions

Assumes ministry budget allocations are transparent and readily available.

Calculation

Percentage of the total government budget that is allocated to the environmental ministries, measured in inflation adjusted currency.

$$\frac{\sum \text{(environmental ministry budget)}}{\sum \text{(total government budget)}} * 100\%$$

$\sum$ (environmental ministry budget) = **the sum of budget allocated to the environmental ministries.**

total government budget = **the total government budget allocation.**

Hypothetical Example of Calculation

A country has a total annual government budget of AUD 5 million, of which AUD 500,000 is dedicated for environmental ministries.
The calculation for this indicator would be AUD 500,000 / AUD 5 million * 100% = 10.0%.

Data Sources

Environment ministry, finance ministry, national statistics office.

Data Collection

Data should be summarised as either proposed budget or actual expenditures and should be available from the ministries or national statistics offices.

Frequency of Data Collection

Annually.

Disaggregation

Funding can be further broken down into committed vs. disbursed amounts, operational vs. programmatic costs, and source (domestically or internationally financed, collected through licensing or enforcement, etc.). Such levels of disaggregation provide detail on whether allocated funds are spent, how funds are spent (actual on the ground work vs. administrative overhead), and where funding originates. Data can also be disaggregated by ministry or agency to better understand which ministries or agencies may lack funding to complete monitoring and reporting.

Best Practices

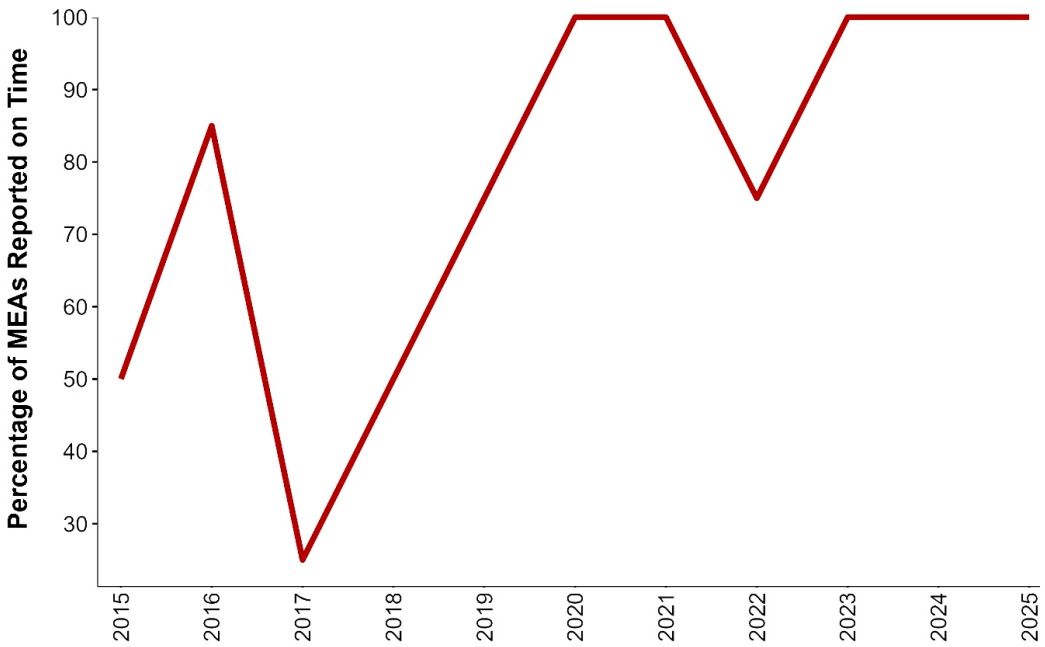
To better understand where funding should be prioritised and determine the optimal budget levels, it is important to also report allocations as a percentage of total funding needed to implement and report on specific programmes. National ministries can be restructured over time and data may become difficult to interpret when administrations change.

Linkages to MEA and other frameworks and strategies

- → Convention on the Conservation of Migratory Species of Wild Animals
- → Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)
- → CITES Strategic Vision 2011–2030: Goal 3
- → Framework for the Development of Environment Statistics 6.1.1, 6.2.1
- → Framework for Resilient Development in the Pacific 1ia, 1ic, 1id, 1ie, 1if, 1ig, 1ih, 1ij, 2ib, 2ic
- → Kunming-Montreal Global Biodiversity Framework Goal D (i), Targets 14, 19, 20
- → Noumea Convention
- → Pacific Coral Reef Action Plan 2021–2030 1.3, 1.4, 1.10, 1.12, 4.5, 4.1, 5.2, 6.10
- → Pacific Islands Framework for Nature Conservation and Protected Areas 2021–2025 – Strategic Obj. 6
- → Pacific Islands Regional Marine Species Programme (PIRMSP) 2022–2026 – A1, A4
- → Ramsar Convention on Wetlands 4th Strategic Plan – Target 17, 19
- → Samarkand Strategic Plan for Migratory Species 2024–2032 – Goals 4, 5
- → SAMOA Pathway/ABAS – 90c
- → SDG 11.4, 11,6, 11.a, 11.b, 15.a, 15.b
- → SPREP Strategic Plan 2017–2026 Regional Objectives 4.4
- → Waigani Convention
- → United Nations Convention to Combat Desertification (Strategic Plan 2018–2030) 5.3

INDICATOR

Multilateral Environment Agreements Reporting Requirements



Multilateral Environmental Agreement (MEA) Reporting. [Hypothetical data for illustrative purposes only.]

Indicator Definition

Percentage of multilateral environmental agreement (MEA) reporting requirements met on time.

Key Terms

N/A.

Purpose

This indicator reports on the effectiveness of countries in meeting and reporting to MEAs as a proxy of capacity for environmental monitoring and reporting.

Desired Outcome

One hundred per cent of MEAs are reported on time.

Assumptions

Assumes there are no data gaps in MEA reporting and that reports met the commitment criteria.

Calculation

Percentage of MEAs that a country is committed to that are reported on time.

$$\frac{\sum \text{(MEAs reported on time)}}{\sum \text{(MEAs committed)}} * 100\%$$

$\sum$ (MEAs reported on time) = **the sum of the multilateral environmental agreements that are reported to on time.**

$\sum$ (MEAs committed) = **the sum of the multilateral environmental agreements that a country has committed to.**

Hypothetical Example of Calculation

A country has committed to 12 MEAs and reports to 11 of these on time within a given year.
The calculation for this indicator would be 11 / 12 * 100% = 91.7%.

Data Sources

Environment ministry, national statistical offices, InforMEA (https://www. informea.org), Regional Pacific NDC Hub.

Data Collection

Direct number of reports submitted on time can be obtained from the ministry responsible for reporting or located on the respective convention website. The countries that are committed to MEAS are reported on Convention websites.

Frequency of Data Collection

Annually.

Disaggregation

Data can be disaggregated by theme of MEA (climate, species, pollution) to understand which theme or sector may need additional support for monitoring and reporting.

Best Practices

Gaps in reporting for certain themes may indicate that there are capacity issues in addressing monitoring and reporting requirements and could be used to inform funding for capacity building. Absolute numbers should also be reported as changes in the number of commitments can affect the percentage.

Linkages to MEA and other frameworks and strategies

→ All MEA's

→ Framework for the Development of Environment Statistics 6.2.3

→ Regional Waste Data Collection, Monitoring and Reporting Framework KPI 8

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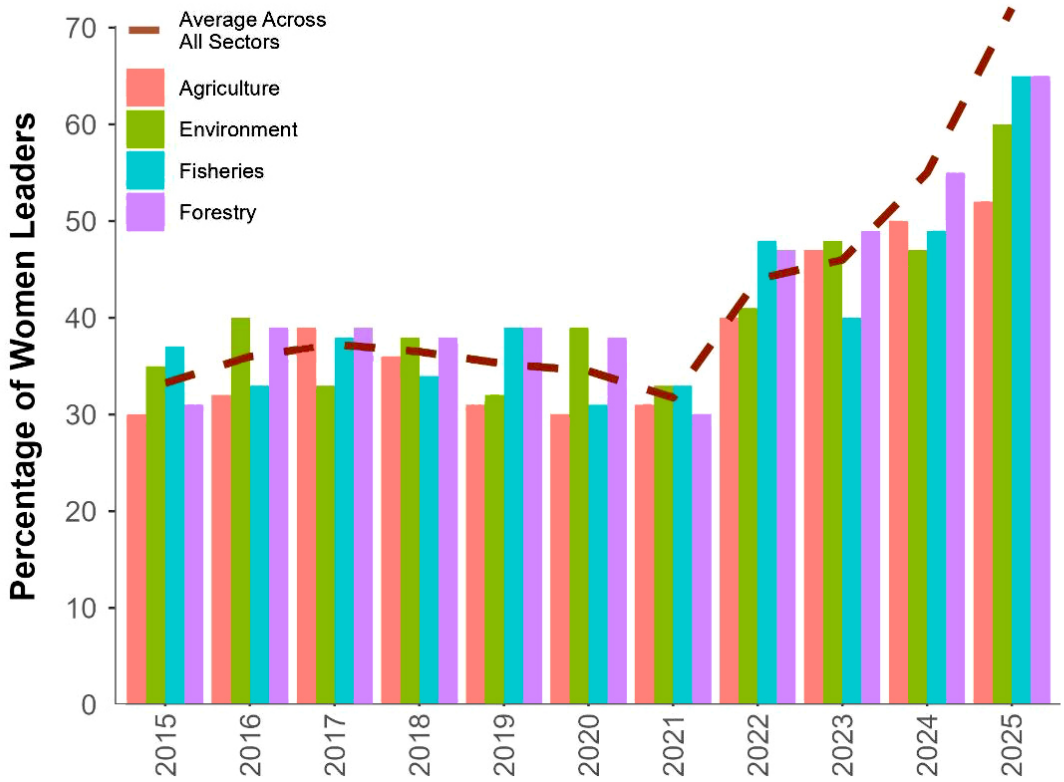
INDICATOR

Women in Environmental Leadership



Women in environmental leadership roles. [Hypothetical data for illustrative purposes only.]

Indicator Definition

Percentage of women in leadership roles (heads of ministries, departments and divisions) in environmental ministries (environment, fisheries, agriculture, and forestry).

Key Terms

Gender equality: a core human right that guarantees fair treatment, opportunities, and conditions for everyone, regardless of gender.

Purpose

Gender equality in environmental leadership is essential for effective and equitable environmental action. Women's involvement in decision-making roles, across various sectors, is linked to more ambitious environmental policies and stronger environmental outcomes. This indicator tracks gender equality in environmental decision-making roles.

Desired Outcome

Positive trend towards gender equality in environmental decision making.

Assumptions

Assumes gender data are available for government.

Calculation

Percentage of the number of women in leadership roles in environment ministries out of the total number of leadership roles in environment ministries.

$$\frac{\sum \text{(women in leadership roles)}}{\text{total number of leadership roles}} * 100\%$$

∑ (women in leadership roles) = **the sum of the number of women in leadership roles in the country's environmental ministries.**

total number of leadership roles = **the sum of the number of leadership roles in the country's environmental ministries.**

Hypothetical Example of Calculation

A country has 45 total environmental leadership roles and 34 of these roles are occupied by women. The calculation for this indicator would be 34 / 45 * 100% = 75.6%.

Data Sources

All relevant ministries, national statistics offices, Global Gender Gap Report (national level), UNESCO, UNESCAP Asia and the Pacific Gender Portal (https://www.asiapacificgender.org/interactive-data).

Data Collection

Ministry or cabinet level data should be available at the government level.

Frequency of Data Collection

Annually.

Disaggregation

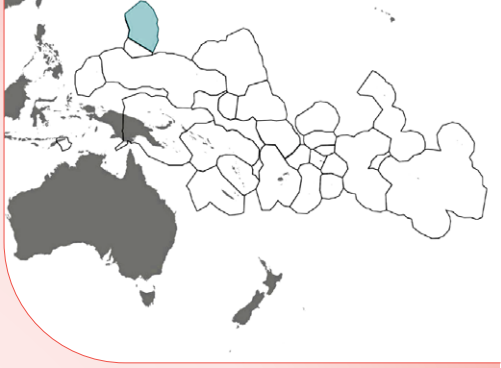
Data can be disaggregated by level (department, division, sector) or ministry if numbers allow.

Best Practices

Total number of leadership positions across the government needs to be reported to understand how percentages change over time. Gender equality in environmental leadership at the national and regional levels is not fully represented by only government sectors. Discussion can be expanded beyond government to include leadership roles in environmental NGOs and community-based management organisations, where women often play a pivotal role.

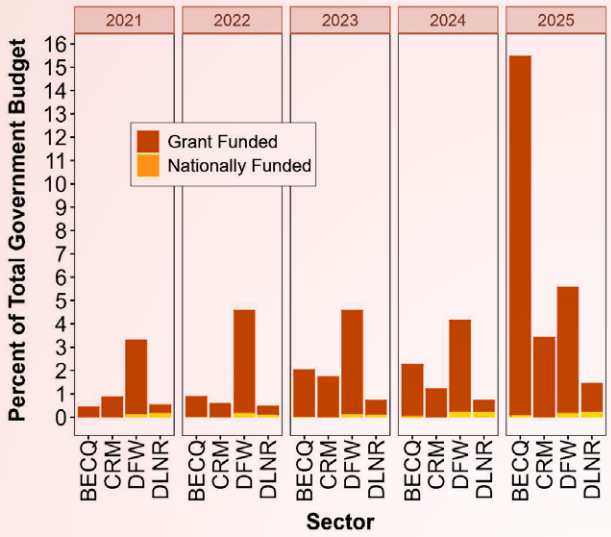
Linkages to MEA and other frameworks and strategies

- → 2050 Strategy for the Blue Pacific Continent – People-Centered Development
- → Framework for the Development of Environment Statistics 6.2.1
- → Growing the Pacific: 2050 Strategy Pacific Agriculture and Forestry: Healthy, Regenerative, Secure
- → Kunming-Montreal Global Biodiversity Framework Targets 22, 23
- → Noumea Convention
- → Pacific Islands Framework for Nature Conservation and Protected Areas 2021–2025 – Strategic Obj. 1, 6
- → Pacific Platform for Action for Gender Equality and Women's Human Rights 2018–2030
- → SAMOA Pathway/ABAS (76–77)
- → SDG 4.7, 5.5



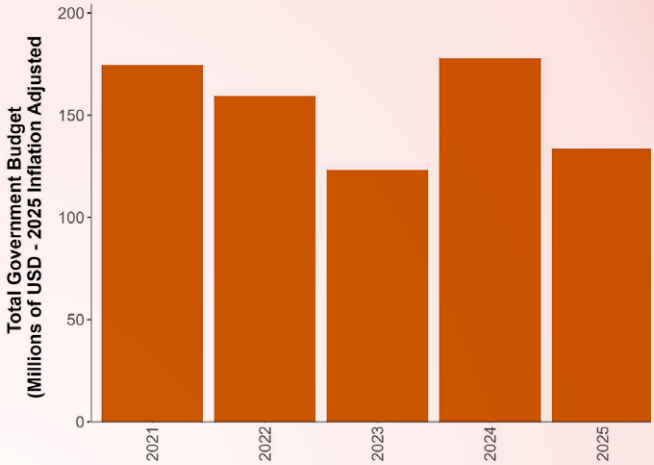
INDICATOR IN ACTION

NORTHERN MARIANA ISLANDS AGENCY BUDGET ALLOCATION



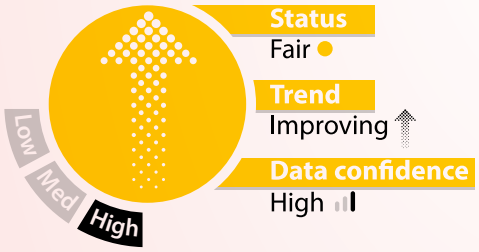
Budget allocations for environmental agency budgets funded by general funds (nationally funded) and federally grant awards (grant funded) as a proportion of national annual budgets in 2025 inflation adjusted United States Dollars (USD) for fiscal years 2021–2025.

Agencies represent the environmental quality (BECQ), coastal resources (CRM), fish and wildlife (DFW), and natural resources (DLNR) sectors.
Source: Governor's Budgets for fiscal years 2021–2025.



National annual budget allocations for the Commonwealth of the Northern Mariana Islands in 2025 inflation adjusted United States Dollars (USD) for fiscal years 2021–2025.

Fiscal years 2021–2024 are expenditure and 2025 is proposed allocation.
Source: Governor's Budgets for fiscal years 2021–2025.



Since 2021, the Commonwealth of the Northern Mariana Islands budget has fluctuated around USD 150 million due to the CNMI's dependence on tourism. However, the proportion dedicated to environmental and natural resources agencies has increased across all sectors to a combined total of 25% of the national budget in 2025. It is promising that the environmental and natural resources agency budget has increased unrelated to the fluctuating national budget. The primary funding source of agency budgets continues to be supported by the United States federal government through competitive and non-competitive grant awards, which can provide an external source of funds. It is recommended to increase or at least maintain the agency annual budget (as a proportion of the national budget) in order to facilitate the achievement of national environmental objectives, mitigate the impact of pressures on the environment, and maintain the ecosystem services that support the national economy, food security, health and other sectors.

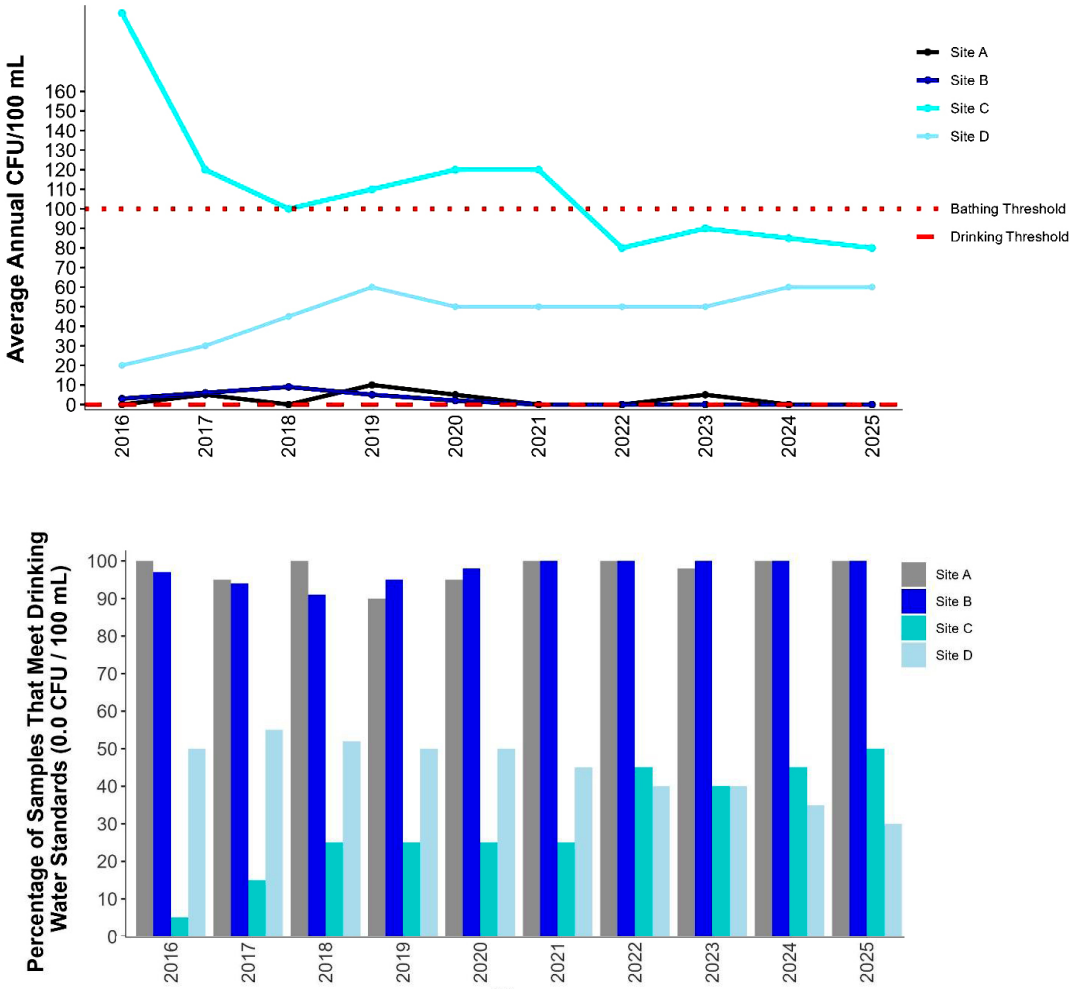
Land

Terrestrial ecosystems provide important services for species and people in the Pacific islands, including carbon sequestration, habitat for endemic species, and food resources. The theme of **Land** presents a total of three indicators that are focused on tracking the health of water, cultivation practices, and forests:

- Freshwater Quality (*E.coli*)
- Land Under Cultivation
- Native Forest Cover

INDICATOR

Freshwater Quality (*E.coli*)



Freshwater quality samples across sites from 2016–2025. [Hypothetical data for illustrative purposes only.]

Indicator Definition

Escherichia coli (E. coli) levels across freshwater monitoring sites.

Key Terms

Enterococci: facultative anaerobic bacteria in short and medium chains, which cause difficult-to-treat infections that are found in wastewater treatment plant effluent, leaking septic systems, stormwater runoff, sewage discharged or dumped from recreational boats, domestic animal and wildlife waste, improper land application of manure or sewage and runoff from manure storage areas.

Purpose

E. coli are indicators of faecal contamination in freshwater bodies and are associated with a range of possible human diseases. High levels of E. coli can also be associated with cloudy water and decreased dissolved oxygen.

Desired Outcome

E. coli thresholds at or below globally accepted standards for drinking and bathing water, which is none detectable per 100 ml for both E. coli and total coliforms for drinking water and varies for bathing and swimming water.

Assumptions

Assumes laboratory facilities are available and sufficient water sampling across the country.

Calculation

Colony forming units (CFU) per 100 ml in laboratory analysis.

$$\frac{\sum (\text{CFU})}{100\text{ml}} * 100\%$$

∑ (CFU) = the sum of the number of colony forming units (CFU) within a sample.

Percentage of water samples under 100 CFU per 100 ml.

$$\frac{\sum (\text{samples under thresholds})}{\text{number of samples}} * 100\%$$

∑ (samples under thresholds) = number of water samples that contain total amounts of colony forming units (CFU) under the health threshold.

number of samples = total number of water samples collected.

Hypothetical Example of Calculation

A water sample is collected and the laboratory analysis shows that there are 90 CFU per 100 ml. This sample is under the 100 CFU/100 ml threshold.

A site has 52 water samples (collected once a week) and 45 samples have CFU under 100 CFU/100 ml. The calculation of water samples under 100 CFU per 100 mL would be 45 / 52 * 100% = 86.5%.

Data Sources

Environment or water resource ministries.

Data Collection

Samples should be collected at the same sites at frequent intervals throughout the year and at multiple sites to provide the best spatial and temporal coverage.

Frequency of Data Collection

Daily or monthly.

Disaggregation

Data should be disaggregated by site or tributary to better understand sources of pollution and how to mitigate for them.

Best Practices

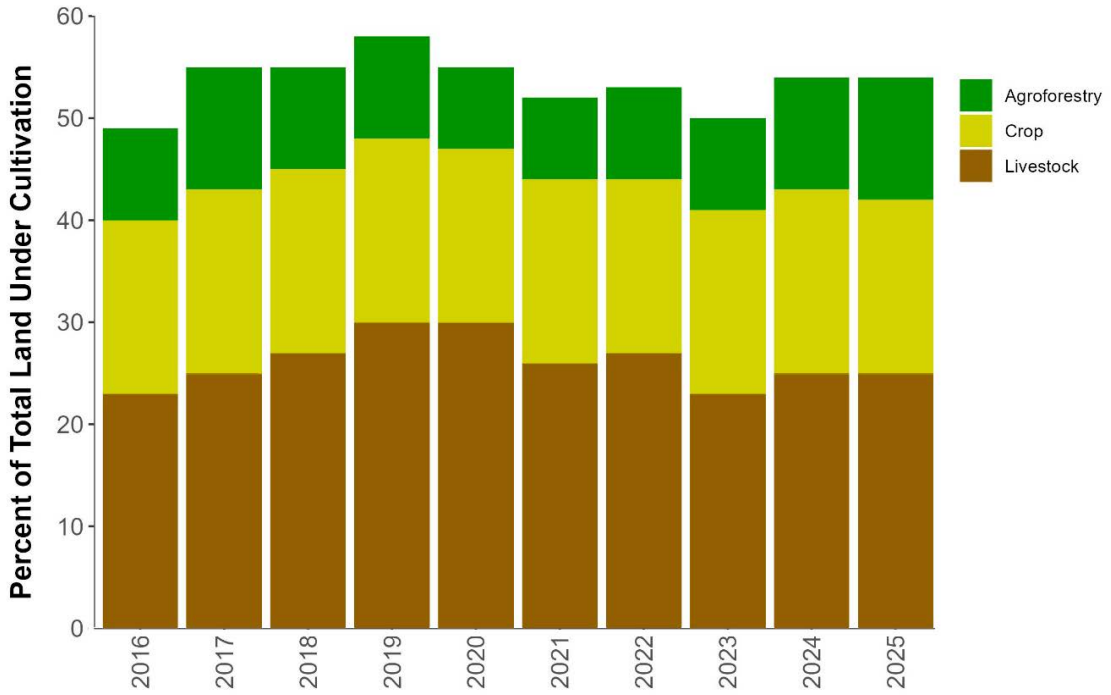
Data can be presented as the average CFU over the year for each site or as the percent samples not contaminated at each site. Biological indicators of water quality (presence of species that are sensitive to water quality) could be useful for discussion of this indicator or used to supplement the metric. Discussion should also include whether water quality monitoring data, reports, or results are made public to assess the availability and accessibility of key environmental information to the public.

Linkages to MEA and other frameworks and strategies

- → 2050 Strategy for the Blue Pacific Continent – People-Centered Development, Climate Change and Disasters
- → Cleaner Pacific 2050 Strategy – Goal 3, 4
- → Framework for the Development of Environment Statistics 1.2.2, 1.3.2, 3.2.3
- → Framework for Resilient Development in the Pacific 2ik
- → Kunming-Montreal Global Biodiversity Framework Goal B (iii), Targets 7, 11
- → Pacific Islands Framework for Nature Conservation and Protected Areas 2021–2025 – Strategic Obj. 5
- → SAMOA Pathway/ABAS – 64–65
- → SDG 6.1, 6.3, 6.6, 14.1
- → SPREP Strategic Plan 2017–2026 Regional Objectives 2.1, 3.1, 3.2, 3.4
- → United Nations Convention to Combat Desertification (UNCCD)

INDICATOR

Land Under Cultivation



Land under cultivation from 2016–2025. [Hypothetical data for illustrative purposes only.]

Indicator Definition

Percentage of total arable land area that is under cultivation.

Key Terms

Arable land: land that can be used for growing crops.

Purpose

Conversion of land for agriculture can decrease habitat for species, deplete soil resources (if unsustainable practices are used), and increase the spread of invasive species. This indicator tracks the area of land that is developed for agriculture as a pressure on species and ecosystems.

Desired Outcome

Stable trend in area under cultivation which implies no ongoing loss of natural areas in agriculture development and no loss of food security and livelihoods.

Assumptions

Assumes data on area under cultivation are available and updated annually. There may also be small plot agricultural production or larger gardens that may be under-reported or underrepresented in data sources.

Calculation

Percentage of total arable land that is under cultivation.

$$\frac{\sum \text{(cultivation area)}}{\sum \text{(arable land area)}} * 100\%$$

∑ (cultivation area) = sum of land area that is under cultivation.

∑ (arable land area) = sum of land area that is considered arable land.

Hypothetical Example of Calculation

A country has a total area of 5,432 sq. km of arable land with a total of 1,043.5 sq. km that are currently used for agriculture and livestock production.
The calculation for this indicator would be 1,043.5 / 5,432 * 100% = 19.2%.

Data Sources

Agriculture Ministry, FAO (http://www. fao.org/forest-resources-assessment/en/).

Data Collection

Data should be available from ministries or global datasets. Remotely sensed data (satellite imagery, Earth observation data, UAV/drone imagery, synthetic aperture radar (SAR) and light detection and ranging (LiDAR)) in combination with data on the ground can be used to make assessments over large areas.

Frequency of Data Collection

Annually to determine immediate trends of land conversion but overall assessments could be sampled less frequently, such as every five years.

Disaggregation

Data can be disaggregated by agricultural type (crop, livestock, agroforestry) or use to better understand pressures to ecosystems.

Best Practices

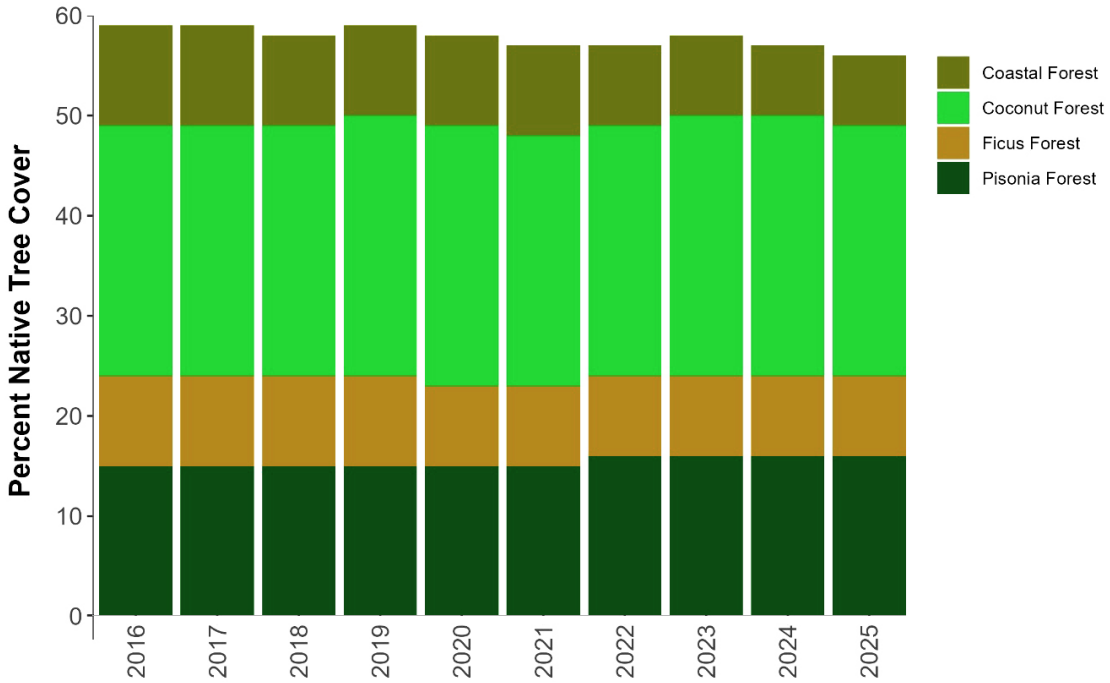
Crop cover can provide information on carbon sequestration, biodiversity, carbon emissions while cultivation practices can provide information on sustainable use of land (nutrient depletion) and other impacts to the ecosystem. FAOSTAT provides country level data on cropland nutrient balances, which can be used to understand pressures on soil resources. Absolute numbers for area (square kilometres or hectares) should also be included as these provide additional information on coverage.

Linkages to MEA and other frameworks and strategies

- → 2050 Strategy for the Blue Pacific Continent – People-Centered Development, Climate Change and Disasters
- → Cleaner Pacific 2050 Strategy – Goal 3, 4
- → Framework for the Development of Environment Statistics 1.2.1, 1.2.3, 2.5.3, 2.5.4
- → Framework for Resilient Development in the Pacific 2ik
- → Kunming-Montreal Global Biodiversity Framework Goal B(iii), Target 10
- → Pacific Islands Framework for Nature Conservation and Protected Areas 2021–2025 – Strategic Obj. 5
- → SAMOA Pathway/ABAS – 63
- → Sendai Framework for Disaster Risk Reduction
- → SDG 2.4, 15
- → SPREP Strategic Plan 2017–2026 Regional Objectives 2.1, 3.1, 3.2, 3.4
- → United Nations Convention to Combat Desertification (UNCCD)

INDICATOR

Native Forest Cover



Native forest cover from 2016–2025. [Hypothetical data for illustrative purposes only.]

Indicator Definition

Percentage of native tree cover relative to total land area.

Key Terms

N/A.

Purpose

This indicator recognises the suite of environmental values and services associated with forests (e.g. biodiversity, carbon sequestration, subsistence hunting) and uses total cover as a proxy for measuring these services.

Desired Outcome

Positive or stable trend, or decrease in rate of tree loss.

Assumptions

Assumes tree cover is accurately mapped and that plantations or stands with introduced species are excluded from the calculation.

Calculation

Percentage of total land that has native forest cover.

$$\frac{\sum \text{(forest tree area)}}{\sum \text{(land area)}} * 100\%$$

$\sum$ (forest tree area) = sum of land area that is native forest.

$\sum$ (land area) = sum of land area.

Hypothetical Example of Calculation

A country has a total area of 5,432 sq. km of land area with a total of 2,659.9 sq. km of native forest. The calculation for this indicator would be 2,659.9 / 5,432 * 100% = 49.0%.

Data Collection

Data should be available from ministries or global datasets. Remotely sensed data (satellite imagery, Earth observation data, UAV/drone imagery, synthetic aperture radar (SAR) and light detection and ranging (LiDAR)) in combination with forest plots can be used to make assessments over large areas.

Frequency of Data Collection

Ideally annually to determine immediate trends of forest loss or restoration but overall assessments could be sampled less frequently, such as every five years.

Disaggregation

Data can be disaggregated by forest type, age class, or cover class to better characterise the extent and variety of ecosystems.

Data Sources

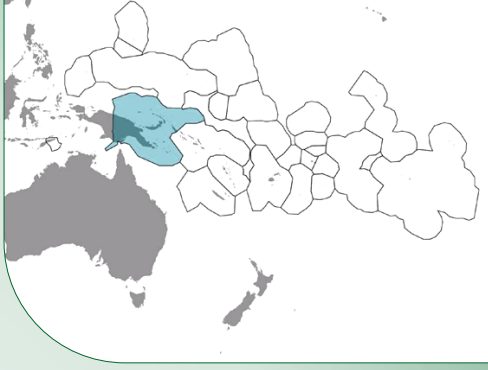
Environment or forestry ministries, NGOs, Global Forest Watch (https://www.globalforestwatch.org/), FAO (http://www.fao.org/forest-resources-assessment/end/), SPC Digital Earth pacific

Best Practices

The indicator's trend can also discuss the rate of forest loss or forest restoration. Absolute numbers for area (square kilometres or hectares) should also be included as these provide additional information on coverage.

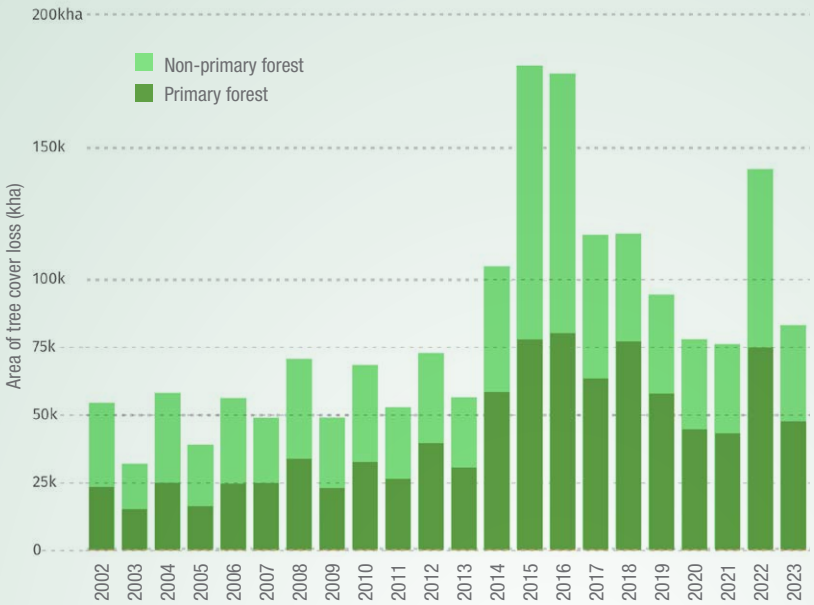
Linkages to MEA and other frameworks and strategies

- → 2050 Strategy for the Blue Pacific Continent – Ocean and Environment
- → Framework for the Development of Environment Statistics 1.2.2, 1.2.3, 2.3.2, 2.5.1
- → Framework for Resilient Development in the Pacific 2id, 2if, 2ii
- → Kunming-Montreal Global Biodiversity Framework Goal B (iii), Targets 2, 8, 10
- → Micronesia Challenge 2030
- → Noumea Convention
- → Pacific Islands Framework for Nature Conservation and Protected Areas 2021–2025 – Strategic Obj. 3
- → Ramsar Convention on Wetlands
- → SAMOA Pathway/ABAS – 90, 94
- → SDG 6.6, 12,2, 15.1, 15.2, 15.5
- → SPREP Strategic Plan 2017–2026 Regional Objectives 2.1, 2.2 and 2.3
- → United Nations Convention to Combat Desertification (UNCCD)

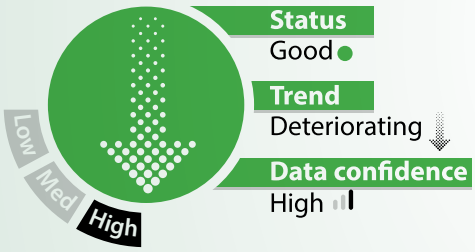


INDICATOR IN ACTION

PAPAU NEW GUINEA'S TREE COVER LOSS



Papua New Guinea's annual tree cover loss between 2001–2023 (Global Forest Watch).



There has been a decrease in annual forest cover in Papua New Guinea with the highest losses occurring between 2014–2018 and loss peaking at 180,800 ha in 2015. Over the period of 2002–2023, the total area of primary forest in Papua New has declined by 2.9% (Global Forest Watch). With most forests remaining intact, the country is well placed to deliver sustainable forestry and agriculture operations through revisions to the Environment Act 2000 and improved collaboration between the Conservation and Environmental Protection Authority and the PNG Forestry Authority.

PART 3 Proposed Indicators for Future Endorsement

The 2025 update to this Guidebook involved realignment of the core regional environmental indicators (REI) with multilateral environmental agreements and regional strategies and frameworks as well as the identification of any new indicators that may be useful for both regional and national reporting commitments. A series of stakeholder validation meetings with SPREP member countries and regional organisations were held during this review as well as internal reviews with SPREP programmes. Based on findings and recommendations from these stakeholder meetings and reviews, we propose the following for future endorsement into the set of Regional Environmental Indicators for Pacific island countries:

Biodiversity Theme

1. **Contribution of Nature/Valuation of Ecosystem Services**

   DEFINITION: Economic valuation/natural capital of ecosystem services and nature's contribution to people.

2. **Governance and Equity of Protected Areas**

   DEFINITION: Percentage of formal protected areas (PAs) and Other Effective Area-based Conservation Measures (OECM) where Site-level Assessment of Governance and Equity (SAGE) or other assessments have been completed using standard SAGE tools.

3. **Integration of Protected Areas into Wider Land and Seascapes**

   DEFINITION: Number of sectoral plans and policies, such as National Sustainable Development Plans or equivalent, where protected areas are integrated into the wider landscapes and seascapes.

4. **Invasive Species Early Detection Rapid Response**

   DEFINITION: Current status of Early Detection Rapid Response (EDRR) policies and plans.

5. **Invasive Species Management Policies and Action Plans**

   DEFINITION: Current status of national invasive species management policies and multi-sector action plans such as National Invasive Species Strategy Action Plan (NISSAP) (current year).

Environmental Governance Theme

6. **Monitoring Capacity**

   DEFINITION: Number of professionals (scientists, technicians, project leads) in the environmental fields that collect or analyse data or outside researchers contributing to environmental research.

7. **Species Trade and Harvest**

   DEFINITION: Percentage of wildlife and plant species that are subject to illegal harvest and trade.

Land Theme

8. **Freshwater Quality (Chemical and Sediment Pollution)**

   DEFINITION: Chemical and sedimentation levels across freshwater monitoring sites.

Coastal and Marine Theme

9. **Lagoon Water Quality (Chemical and Sediment Pollution)**

   DEFINITION: Concentration of nitrogen, phosphorus, chlorine, and sediment loads in coastal waters.

10. **Marine Plastic Pollution**

    DEFINITION: Percentage of plastic in waste audits, including beach clean-ups.

EUROPEAN UNION

SPREP
Secretariat of the Pacific Regional Environment Programme

Pacific BioScapes

ACP MEAs 3

NEW ZEALAND
FOREIGN AFFAIRS & TRADE
Manatū Aorere

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