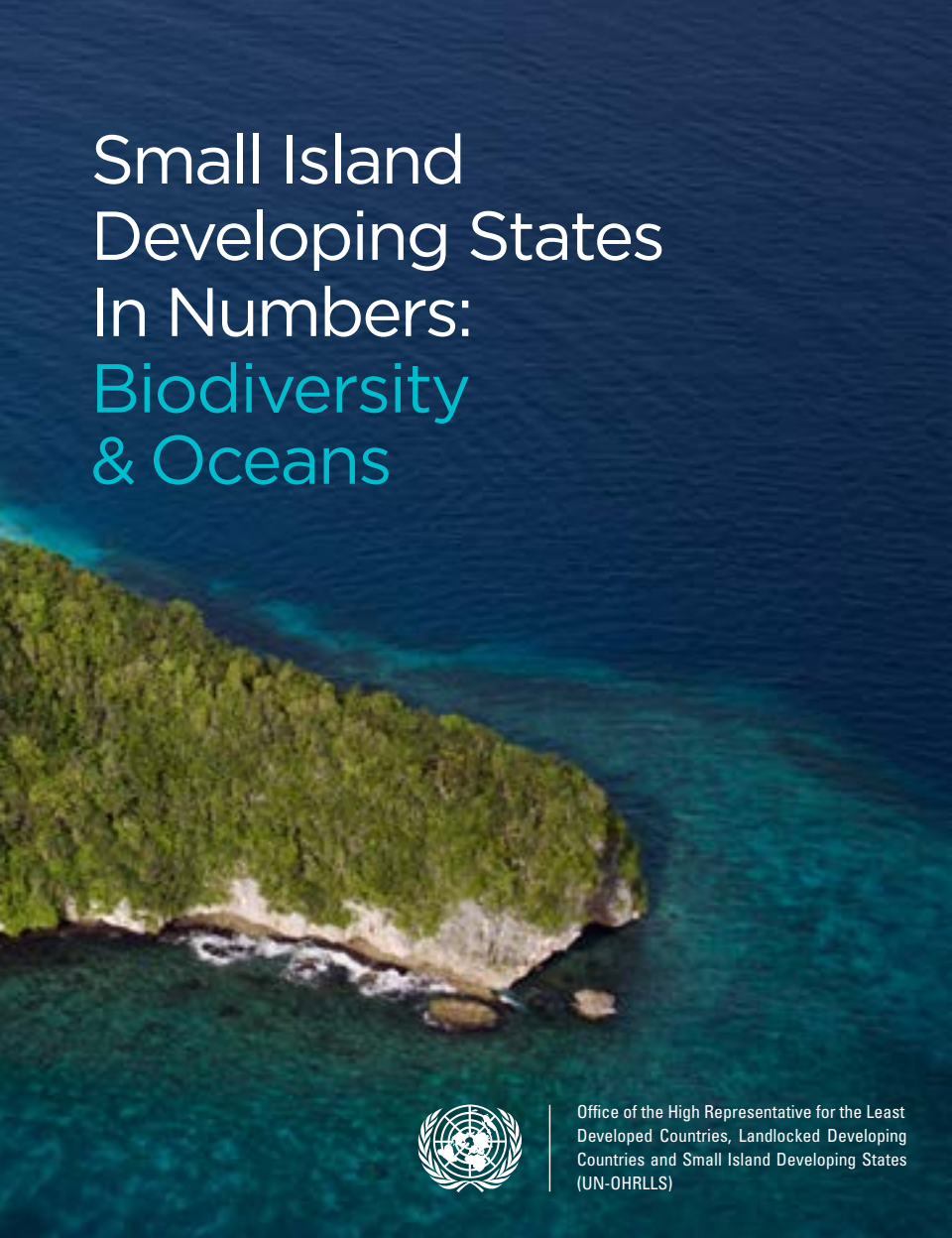
Small Island Developing States In Numbers: Biodiversity & Oceans



Office of the High Representative for the Least Developed Countries, Landlocked Developing Countries and Small Island Developing States (UN-OHRLLS)

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UN-OHRLLS MANDATE

UN-OHRLLS

The UN Office of the High Representative for the Least Developed Countries, Landlocked Developing Countries and Small Island Developing States (UN-OHRLLS) was established by the United Nations General Assembly in 2001 through its resolution 56/227 with functions recommended by the Secretary-General in paragraph 17 of his report A/56/645.

The UN-OHRLLS mandate from the General Assembly calls upon the Office to engage in advocacy and mobilization of international support and resources for the implementation of the Programme of Action for Small Island Developing States (SIDS), also known as the Barbados Programme of Action (BPOA). The latter outcome is known as the Mauritius Strategy for Implementation of the Programme of Action for the Sustainable Development of Small Island Developing States (MSI).

With the successful conclusion of the Third International Conference on SIDS in 2014, the office's mandate was further amplified to ensure the mainstreaming of the SAMOA Pathway and issues related to SIDS in the work of the United Nations system and to enhance the coherence of the issues of those States in United Nations processes, including at the national, regional and global levels.

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THE SMALL ISLAND DEVELOPING STATES (SIDS)

The SIDS are a distinct group of 38 UN Member States and 20 Non-UN Members or Associate Members of the Regional Commissions that span three geographic regions: the Caribbean, the Atlantic, Indian Ocean, Mediterranean and South China Sea (AIMS). The aggregate population of all of the SIDS is 65 million, slightly less than 1% of the world's population, yet, this group faces unique social, economic, and environmental challenges.

Biodiversity is an important issue for the livelihood of many SIDS, as industries like tourism and fisheries can constitute over half of the GDP of small island economies. However, the importance of these natural resources extends beyond the economy; biodiversity holds aesthetic and spiritual value for many island communities. For centuries, these communities have drawn benefits from biodiversity in the form of food supply, clean water, reduced beach erosion, soil and sand formation, and protection from storm surges.

SIDS In Numbers: Biodiversity and Oceans outlines the scope of biodiversity and its immense value across the three geographical regions that form the SIDS group. This edition also aims to highlight threats to biodiversity and present examples of strategies and initiatives to help to counteract these threats and mitigate damage.

> “Island biodiversity is not only about biodiversity of Small Island Developing States, it is about islands as ecosystems of global significance.”
>
> Dr. Spencer Thomas, Ambassador from Grenada

Data and statistics presented in this publication should not be taken as authoritative. They simply attempt to illustrate and advocate for the special case of the SIDS in the context of biodiversity. Data was obtained from a variety of publicly available resources, including recent publications by the World Wildlife Fund (WWF), the World Bank Group (WBG), the UN Environment Programme (UNEP), and other UN agencies.

While extensive literature on biodiversity exists on a global scale, the SIDS regions (and the individual countries within them) are under-researched in many areas. Consequently, at times, it can be challenging to find specific information on the impact of lost biodiversity in the SIDS.

HISTORY OF SMALL ISLAND DEVELOPING STATES

At the 1992 United Nations Conference on Environment and Development, held in Rio de Janeiro, Brazil, the SIDS were recognized as a special case in the context of Agenda 21, Chapter 17 G: *"Protection of the oceans, all kinds of seas, including enclosed and semi-enclosed seas, and coastal areas and the protection, rational use and development of their living resources."*

In 1994, the BPoA prescribed specific actions to enable SIDS to achieve sustainable development and, in 2005, the MSI was adopted to address the remaining gaps in implementation.

The international community gathered in Samoa, in 2014, for the Third International Conference on SIDS to forge a new pathway for the sustainable development of this country group. What emerged, the SAMOA Pathway recognizes the adverse impact of climate change and sea-levels rising on the SIDS' efforts to achieve sustainable development; the Pathway also addresses economic development, food security, disaster risk reduction, and ocean management, among other issues.

While many SIDS have made advances in achieving sustainable development, their inherent vulnerabilities- small size, remoteness, biodiversity loss, climate change susceptibility, and narrow resource base- mean that progress for many countries has been stunted, and the relevance of their "special case" status remains.

Papua New Guinea/Good Free Photos

DEFINING ISLAND BIODIVERSITY

Island biodiversity refers to the unique variation of living organisms in an ecosystem- from mammals to bacteria. Islands often have precious and rare biodiversity systems because they tend to be small, insulated locations and species are often highly specialized to suit their environments, adapting to niche conditions.

The isolation of islands results in great concentrations of endemic- existing nowhere else on Earth- flora, fauna, animals, and microorganisms. In fact, islands have a more significant number of endemic species than continents do. The result is a "distinct genetic reservoir" that offers new characteristics and adaptations, like dwarfism, yet population sizes tend to be limited, due to lack of geographic space.[1]

American Samoa/Ian Shive, USFWS, Flickr

Biodiversity also refers to the various ecosystems that occur across different landscapes. The interaction of various living beings with one another and their surrounding environment is the essence of biodiversity.

Islands, thought of as biodiversity "hotspots," have been regarded as making the greatest contribution to global biodiversity proportional to their size, as they contain "some of the richest reservoirs of plants and animals on Earth."[2]

FRESHWATER & MARINE SPECIES

The Caribbean

The Caribbean houses 10% of the world's coral reefs and approximately 1,500 species of fish and marine mammals. The reef surrounding the Caribbean provides wintering and nursing grounds for many Northern Atlantic migratory species, including the humpback whale and the endangered American crocodile.[3] The Northern Caribbean has one of the largest reefs in the world, the Andros Barrier Reef, and in the South, seagrass meadows, mangrove forests, and coral are abundant. The Gulf of Paria, between Venezuela and Trinidad, also has particularly rich biodiversity of marine life.[4]

The shallow marine environment of the Caribbean hosts 8% to 35% of endemic marine taxa: 25 coral genera, 117 sponges, 633 mollusks, 1,500 fish, 76 sharks, 45 shrimp, 30 cetaceans, 23 seabirds, and six of the seven worldwide species of sea turtle.

Featured Species: Endemic, endangered species include: Jamaican Killifish (freshwater) and Caribbean Reef Sharks (saltwater).

Caribbean Reef Shark/Jack, Flickr

The Pacific

Islands in the Pacific region play host to 476 globally threatened species.[5] Over half of the world's known species of cetaceans, the majority of remaining dugong populations, and the largest groupings of hawksbill, green, and loggerhead turtles are also found in the marine regions of Pacific SIDS.[6]

Ecosystems in the East Melanesian Islands' Coral Triangle support 75% of known coral species (nearly 600), six of seven species of marine turtle, approximately 2,000 species of reef fish, and large populations of commercially valuable tuna.[7]

The World Wildlife Fund's Global 200 list, which prioritizes ecosystems for conservation, includes five outstanding coral ecoregions in the Central Indo-Pacific SIDS: the Bismarck-Solomon Seas, the New Caledonia Barrier Reef, the Palau Maine, the Tahitian Marine, and the Fiji Barrier Reef.

The Phoenix Islands Protected Area (PIPA) is one of the largest UNESCO World Heritage Sites and is the largest marine protected area in the Pacific. It is the first island in the Pacific to contain deep-sea habitats with eight atolls and two submerged reef systems, with the average depth of the water more than 4,500 meters. PIPA has over 120 species of coral, 518 species of reef fish, and is used by sea turtles, seabirds, dolphins, and abundant fish populations use the area as migratory or breeding grounds. The area is not only protected but it is recognised as a place of global significance.

Coconut Crab/Island Conservation, Flickr

Featured Species: Coconut Crab (also known as: Palm Thief or Robber Crab) is the largest species of terrestrial hermit crab and the largest land-living arthropod. It is native to the tropical Indo-Pacific Region and is on average one meter long and weighs three kilograms.[8] It is reported that they can lift up to 28 kilograms.[9]

The AIMS

The islands in the AIMS region are extremely ecologically diverse and feature numerous ecosystems and biomes. Coastal and marine habitats include beaches, dunes, coral reefs, and mangroves. AIMS are host to "reef islands," where coastal vegetation, like mangroves, protect shores which could otherwise be vulnerable to erosion.

Turtle in Maldives / Mathias Apitz (München), Flickr

The Indian Ocean is home to 10,000 shallow water marine species, including 2,000 fish and four species of marine turtles.[10] The hawksbill, green, and loggerhead turtles are all on IUCN's Red List ranging from critically endangered (hawksbill) to endangered (green and loggerhead). Nesting sites of particular importance for sea turtles exist in Comoros and Seychelles. Moheli Island, Comoros has been declared a marine reserve to preserve the dwindling number of green turtles it houses year round. Similarly, in Seychelles, the Cousin Island Special Reserve is considered the most important nesting ground for hawksbill turtles in the West Indian Ocean, hosting the largest number worldwide.

Spotlight: The Maldives, whose land mass is only 115 square-miles, sustains 1,100 species of demersal and epipelagic fish, including sharks, five types of sea turtles, and 21 species of whales and dolphins. The country also boasts over 145 species of crab, 48 species of shrimp, five species of seagrass, and 285 species of alga. The Maldives is made up of 26 natural coral atolls, housing the largest in the world, the Huvadhoo Atoll. Coral reefs are fundamental to the success of fisheries in the Maldives, providing food and construction materials for the country.[11]

LAND MAMMALS

Rodents on islands tend toward gigantism, while carnivores, lagomorphs (e.g. rabbits and hares), and artiodactyls (e.g. deer and hippos) are more likely to become dwarfed. Overall, among mammal species that colonize islands, big ones have a tendency to shrink, while small ones are apt to enlarge.[12]

Pacific Sheath-tailed Bat in Fiji / Joanne Malotaux, Wikimedia Commons

The Pacific

The Pacific Sheath-tailed Bat is classified as Endangered by the IUCN Red List. All four subspecies of the Bat have slowly disappeared from some of the Pacific island nations where they were historically found.

The AIMS

Seychelles hosts the world's rarest bat: the Sheath-tailed Bat, whose global population is between 30 and 100. Its name refers to the membrane that extends between the bat's hind legs, which can be placed over its tail; the membrane provides precise movement in flight between the rainforest trees of their habitat.[13]

BIRDS

Birds on small islands often are very different to their counterparts on mainland because of the curious ways in which island animals evolve. J. Albert Uy, the Aresty Chair in Tropical Ecology at the University of Miami, has said that island-dwelling species of all kinds are different from mainland species because "top predators are missing and the competition is relaxed, so you get all of these trajectories that aren't possible on a crowded continent."[14] These "trajectories" include darker colours, loss of flight, mega-growth, shrinkage, and passive behavior.[15]

The Caribbean

Approximately 350 species of birds which breed in North America annually migrate to the Caribbean for the winter. During the summer months, a smaller number of birds migrate to the Caribbean from South America to mate and lay eggs. As a result, birds in the Caribbean, endemic or otherwise, represent the linkages between the neighbouring regions and their ecosystems.

The Society for the Conservation and Study of Caribbean Birds is the largest organisation dedicated to avian species in the Caribbean and hosts annual International Migratory Bird Day events

Bird in Seychelles / Icymonkey, Flickr

throughout the month of October. The goal of the events is to celebrate the diversity of species of migratory birds in the region as well as to raise awareness about species endangerment.

The Caribbean Birding Trail is another association which aims to raise awareness about Caribbean birds. The organisation encourages locals and visitors to take up birding to create and promote nature-based experiences and push a conservation agenda.[16] The organisation advocates for a mandate of sustainable ecotourism for both Caribbean locals and tourists; ecotourism creates employment for locals and teaches them the importance of protecting their environment, while exposing foreigners to the range of natural resources in the Caribbean.

The Pacific

Smaller islands in the Solomon Islands have a higher percentage of darker, more aggressive birds than those in larger islands. This is advantageous to the birds there because increased melanin in feathers makes them sturdier, which in turn helps the birds better regulate their body temperatures and resist severe weather conditions, which are more common on islands than on the mainland.

Darker and more aggressive birds are more successful in small islands because of the short supply of breeding territories. The Chestnut-bellied Monarch is one such example. It is a songbird endemic to the Solomon Islands. On the smaller islands, they are pure black and more aggressive while on larger islands they are less aggressive more colourful.

The AIMS

There are 384 bird species in Singapore. More than 50% of birds in the Indian Ocean islands are endemic to Singapore.[17] There are 15 endemic species of bird on the islands of the Comoros. For example, the three unique varieties of the Scops Owl are endemic to three different islands: the Comoros Scops Owl, the Mohéli Scops Owl, and the Anjouan Scops Owl; all three are critically endangered.[18]

Among the islands in the Seychelles archipelago is one named Bird Island. It is privately owned and acts as a bird sanctuary and resort. Before humans set foot on the island, it was an important nesting site for the migratory Sooty Tern. Today, Bird Island hosts 1.5 million Sooty Terns who descend on the island to mate and nest.

Featured Species: The Dominica Imperial Amazon Parrot (the Caribbean). Chestnut-bellied Monarch (the Pacific). Comoros Scops Owl, the Mohéli Scops Owl, the Anjouan Scops Owl, and Sooty Tern (the AIMS).

REPTILES

In total, there are 1430 reptile species in SIDS of the world's 10,038 or 14%.[19]

- 500 in the Caribbean
- 570 in the Pacific
- 360 in the AIMS

The Caribbean

The Grand Cayman Blue Iguana is a giant lizard endemic to Grand Cayman of the Cayman Islands archipelago. They average five feet in length and 25 pounds in weight and can live up to 70 years. This iguana species was once considered the most endangered on Earth, which has pushed activists to create the Blue Iguana Recovery Programme to facilitate the protection of the species. As a result of the programme, the Blue Iguana is no longer the most endangered of the iguana species.

Blue Iguana in the Cayman Islands / Don Taylor, Flickr

The Pacific

The Aldabra Tortoise is of the largest tortoises in the world. In fact, the oldest animal in the world is an 184-year-old Aldabra Giant Tortoise. The Aldabra Tortoise is endemic to Seychelles, but has also been introduced to Mauritius and la Réunion.[20] Males can weigh up to 250 kilograms and be 1.2 meters in length. Mexican biologist José Antonio de Alzate y Ramirez has referred to the Aldabra Tortoise as the "ninja" of the tortoise world because of the acrobatic feats they undertake to reach low-hanging branches. They will stand on their hind legs to reach branches, risking falling onto their backs and not being able to right themselves.[21]

The AIMS

Nearly 50% of reptile species in the AIMS islands are endemic to the region. There are 13 endemic reptiles in the Mascarene Islands alone. Comoros houses 10 endemic species of reptiles and more than 24 species total. Round Island, an island off of the tip of Mauritius is classified as a nature reserve because of the unusually large number of rare endemic reptiles who live there.[22]

AMPHIBIANS

Unlike birds and reptiles, amphibians are usually absent from oceanic islands because their moist skin makes them sensitive to salt water and they can't survive a long journey at sea.[23]

The Caribbean

The Caribbean has the world's smallest frog: the Trinidad Golden Tree Frog. Considered endemic to the island of Trinidad, it has been identified as Critically Endangered by the IUCN Red List. The Golden Tree Frog is found in a restricted habitat range at Trinidad's highest peaks, from 936 to 940 meters elevation, which leaves the amphibian susceptible to climate change, habitat alteration, and diseases.[24]

Frog in Belize / Benjamin Thompson, Flickr

The AIMS

The Seychelles is the only island group in the world that has an endemic family of frogs, called the Sooglossidae (or Seychelles Frogs). The population is estimated as living at densities of 667 to 2,000 animals per hectare and has an area of occupancy "probably less than 20 kilometers squared", which qualifies it for Vulnerable status on the IUCN Red List.[25] Habitat degradation, through fire, invasive species, ecological disasters, and climate change, is considered the main threat facing the Seychelles Frogs.

100% of the amphibians in Sao Tome and Príncipe are endemic, with the most recent discovery in Príncipe- the Green Tree Frog- bringing the biodiversity of the island to eight endemic species.[26] Admittedly, that number may seem small, but, in contrast, "there are no endemic amphibians in either the Hawaiian or Galapagos Islands."[27]

INSECTS

Insects represent the most biologically diverse grouping worldwide, with over 1 million species documented. It was estimated, in 2015, that total insect diversity varies from 2.6 to 7.8 million species.[28]

Insect conservation has not been a major priority, due to the global loss of biodiversity across all species families; however, there are examples of successful insect conservation, like Papua New Guinea's Queen Alexandra Birdwing- the world's largest butterfly.

Featured Species: It is estimated that Papua New Guinea is home to over 6,000 types of dragonflies; their larva live in freshwater, often a good indicator of water quality.[29] The Fijian long-horned beetle is native to Fiji and can grow up to 15 centimeters or the size of an average ballpoint pen.

Papua New Guinea / David Cook, Flickr

FLORA

The plant life of SIDS are highly valuable, both locally and internationally. Exportable plants such as sugarcane, coconut and coffee and their products thrive in the humid and hot climates of most SIDS. Agriculture is one of the most important industries to SIDS and contributes significantly to the GDP of may SIDS countries. Crops, such as banana and breadfruit, and root vegetables, like taro and sweet potato, are dietary staples in many SIDS.[30]

The Caribbean

The flora of the Caribbean region is estimated to comprise 7,000 endemic species.[31] However, the recent spread of invasive alien species is regarded as a significant transboundary threat to the health of biodiversity and ecosystems.

The Pacific

The South Pacific's high islands support a vast range of flora, while the low islands are restricted to a few species, such as coconuts and pandanus. Rainforests fill the valleys and damp windward slopes of the high islands, while brush and thickets grow in more exposed locations. Hillsides in the drier areas are covered with coarse grasses.[32]

Atolls in the Pacific Islands have some of the least diverse vegetation on Earth. For example, atolls can be found with 15 or less endemic species present.

The Coral Triangle located in the waters of Papua New Guinea, Timor-Leste and Solomon Islands, among others, contains an astonishing 75% of the world's coral species, nearly 600 species of reef-building corals.

The AIMS

There are approximately 6,416 species of vascular plants in the AIMS islands:[33]

- 14,000 in Indian Ocean Islands
- 2,100 in Singapore
- 664 in Cape Verde
- 357 in Bahrain
- 1,000 in Guinea-Bissau
- 895 in Sao Tomé and Principe

In Mauritius, several endemic species of plants presumed extinct have been rediscovered, such as Trochetia Parviflora, Pandanus Iceryi and P.cf. Macrostigma, the endemic Acanthaceae Dicliptera Falcata. New species, like the Cyathea Borbonica Var. Sevathiani, Dombeya Sevathianii, and Eugenia Marioalletti, continue to be discovered and described.[34] The trend is similar in Réunion where species are rediscovered, and new species are regularly discovered and described.[35]

The Huvadhoo Atoll in the Maldives is the largest natural atoll in the world. It is approximately 3,510 kilometers-squared, which is about the same size as the American state of Rhode Island.

Biodiversity is valuable to SIDS across three strata: economic importance, environmental importance, and cultural and social significance.

ECONOMIC

Small island nations derive a large percentage of their total wealth from natural capital- defined as natural assets that enable human life (i.e. geology, soil, air, waater, and all living things). And industries like tourism, commercial fishing, and agriculture—all prominent economic activities in SIDS—heavily depend on this natural capital and cannot exist without healthy, diverse ecosystems.

Strong biodiversity not only generates revenue through industries for SIDS, it also helps prevent the incurrence of additional costs that can result from climate change, soil erosion, pollution, floods, natural disasters, and other destructive phenomena.

For SIDS, the Exclusive Economic Zone (EEZ)—the area of the ocean under their control—is, on average, 28-times the country's land mass. The result is that the majority of resources come from the ocean, with the livelihood of many depending on it, and explains why the impact of marine biodiversity damage is a serious concern for SIDS. Factors like small population size, remoteness from international markets, high transportation costs, vulnerability to exogenous economic shocks and fragile land and marine ecosystems, make SIDS particularly vulnerable to biodiversity loss because they lack economic alternatives.

Tonga / John Abel, Flickr

Fisheries

Fishing is a key industry for many SIDS. It's contribution to GDP, on some islands, ranges from 5% to 12% and can account for over 50% of total exports on others. Biodiversity offers a great economic opportunity for many SIDS through fish trade, with the current market value globally around US$ 120 billion. However, this valuation is largely based on overfishing—a practice that is damaging to ecosystems and sustaining biodiversity. Better management and protection of marine biodiversity would not only benefit SIDS, but it would also positively impact other economies around the world, in particular Asia, with the WBG estimating that the value of the global fisheries market will grow to US$ 900 million.

The Pacific Islands and the Economic Contributions of Tuna Fishing[36]

Islands	Population	Percentage of Government Revenue	People Employed
Cook Islands	15,300	N/A	25
Fiji	867,000	N/A	4,332
Kiribati	113,400	~84%	870
Republic of Marshall Islands	54,900	~12%	1,318
Federated States of Micronesia	102,300	~40%	194
Nauru	10,900	~26%	N/A
Palau	18,000	~10%	36
Papua New Guinea	7,744,700	~4%	9,562
Solomon Islands	642,000	~9%	1,824
Tokelau	1,160	~98%	N/A
Tuvalu	11,300	~52%	397
Vanuatu	227,600	N/A	150

Source: Forum Fisheries Agency; Secretariat of the Pacific Community; International Monetary Fund; Williams and Terawasi, 2015.

Tourism

Tourism is another vital industry for small islands; in some cases, it makes the greatest contribution to an island economy's GDP. Ecotourism- broadly defined as environmentally responsible travel- has become a popular subset of tourism that offers a significant opportunity for SIDS economies. In the Seychelles, for example, ecotourism indirectly accounts for more than 50% of GDP.

Federated States of Micronesia / David Weekly

Dominica serves as another case study for a country that derived economic benefits from its natural capital, including biodiversity. As Dominica faced a declining banana industry, where 40% of the labour force was employed in agriculture, the country's tourism board began to promote itself as "The Nature Island." Dominica highlighted the island's rugged terrain- tropical rainforests, geothermal hot springs, black sand beaches- and it's extremely diverse species of flora and fauna. Following the establishment of the Morne Trois Pitons National Park in 1975, the first UNESCO World Heritage Site in the Eastern Caribbean, estimates show that tourism now contributes to 18% of Dominica's GDP.

ENVIRONMENTAL

The environmental value of biodiversity is vast; it helps protect coastlines, prevent natural disasters, and mitigate damages from unstable weather conditions or dangerous natural phenomena. In this respect, human populations benefit greatly from healthy coral reefs, flourishing mangrove forests, and clean air, as SIDS are proportionally more vulnerable to natural disasters. It is reported that the economic cost of the average natural disaster, for small states, is equivalent to almost 13% of GDP, affecting 10% of the population.[37] These metrics are less than 1% in larger countries.

In fact, island biodiversity, both in oceans and on land, is recognized as contributing to the maintenance of worldwide ecosystem functions; these functions support nutrient cycling, the regulation of climate and disease, and the bolstering of global biodiversity.

Furthermore, terrestrial ecosystems, including endemic and rare flora and fauna, found on SIDS have the potential to unlock pressing scientific questions, aiding in the production of universally beneficial medicines, food crops, biofuels, and other low-energy materials.

CULTURAL & SOCIAL

Biodiversity plays a significant role in shaping and fostering a nation's cultural identity and improving the quality of life in local communities. Conservation initiatives are underway on many islands to preserve species symbolic to the nation's heritage or of importance to their ecosystem.

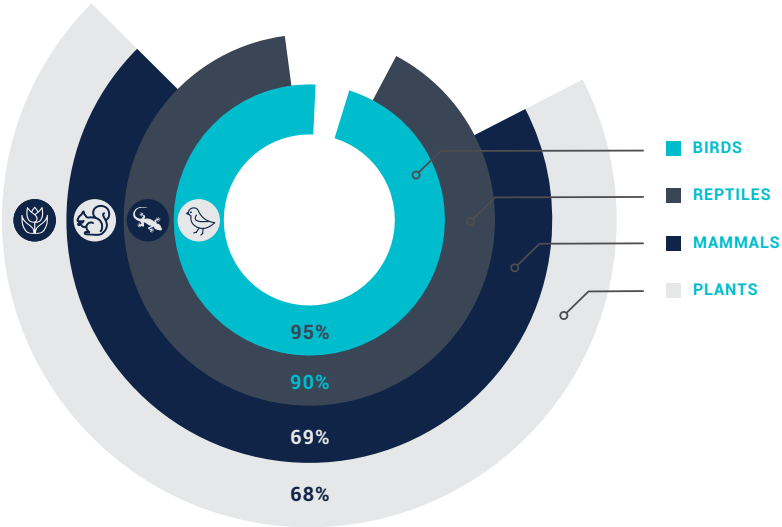
For example, Moheli, one of the Comoros Islands, was classified in 2001 as a marine reserve to protect the green turtles that inhabit it year round from poaching. It is near impossible to quantify that cultural and social value that natural assets, derived from a rich ecosystem, add to island communities; this is particularly the case in regions where biodiversity serves a multitude of purposes.

The flora of the Caribbean region, estimated to have over 7,000 endemic species, boasts as many cultural uses as economic ones.[38] "Bush tea" or herbal medicines, for example, are part of the region's traditional healing practices, treating maladies from the common cold to diabetes. Since the early 2000's, the spread of invasive alien species has posed a transboundary threat that played a major factor in species decline, extinction, and loss of biodiversity goods and services in SIDS.[39]

Of the 27 countries and territories most vulnerable to coral reef degradation and loss, 19 (70%) are small island states, where people are more likely to depend on reefs.

EXTINCTION RISKS AT A GLANCE

The Secretariat of the Convention on Biological Diversity considers the species in SIDS to be at the greatest risk of extinction. In fact, of all the species extinctions worldwide, the majority have occurred on islands: 95% of bird extinctions, 90% of reptile extinctions, 69% of mammals extinctions, and 68% of flora extinctions.



Common threats include:

- Climate Change
- Overexploitation
- Poaching
- Unsustainable hunting
- Illegal wildlife trade
- Clearing of forests and grasslands
- Draining wetlands for agriculture and cities
- Fragmentation of harmful species into foreign ecosystems
- Pollution
- Diseases
- Natural Disasters

Climate change is the greatest threat to biodiversity across the globe. Marine biodiversity, of great importance to many SIDS, is threatened by continued pollution, sedimentation, marine diseases, and overfishing.[40] Comoros, Fiji, Grenada, Haiti, Kiribati, and Vanuatu are some of the most vulnerable, due to their limited capacity to adapt.[41]

Aside from climate change, small island nations and their wildlife, often endemic, also face the threat of poaching, deforestation, and pollution. Habitat loss and competition from invasive species upsets animal populations and causes imbalances in the ecosystem.

BIODIVERSITY HOTSPOTS

The Critical Ecosystem Partnership Fund (CEPF) lists the following two criteria for biodiversity hotspots:

1. The region must have at least 1,500 vascular plants as endemics, which is to say, it must have a high percentage of plant life found nowhere else on the planet. A hotspot, in other words, is irreplaceable.
2. The region must have 30% or less of its original natural vegetation. In other words, it must be threatened.

SIDS that qualify as the world's biodiversity hotspots: Caribbean Islands, East Melanesian Islands, New Caledonia, Mesoamerica, Wallacea, (Polynesia-) Micronesia, and Indian Ocean Islands.

ENDEMISM

Of the world's total 29,046 native species (indigenous or introduced), 3,402 are in SIDS (12%). Of the world's 2,303 native endemics, 171 are in SIDS (7.4%).[42]

Threatened Species in Each Country[53] (totals as of 4 May 2017)			
Country or area	Total Species	Total Threatened	% of Total Threatened
Antigua and Barbuda	1357	55	4.05%
Bahamas	1852	86	4.64%
Barbados	1344	56	4.17%
Belize	2228	117	5.25%
Cuba	2238	339	15.15%
Dominica	1397	66	4.72%
Dominican Republic	1755	184	10.48%
Grenada	1297	54	4.16%
Guyana	2481	94	3.79%
Haiti	1723	205	11.90%
Jamaica	1814	311	17.14%
St. Kitts and Nevis	1287	52	4.04%
St. Lucia	1345	62	4.61%
St. Vincent and the Grenadines	1366	58	4.25%
Suriname	2272	83	3.65%
Trinidad and Tobago	1992	69	3.46%
Caribbean Subtotal	27748	1891	6.81%
Federated States of Micronesia	1862	167	8.97%
Fiji	2193	291	13.27%
Kiribati	1336	104	7.78%
Marshall Islands	1418	101	7.12%
Nauru	1097	82	7.47%
Palau	2042	182	8.91%
Papua New Guinea	4737	493	10.41%
Samoa	1416	93	6.57%
Solomon Islands	2543	245	9.63%
Timor-Leste	1099	24	2.18%
Tonga	1437	79	5.50%
Tuvalu	1170	96	8.21%
Vanuatu	1917	137	7.15%
Pacific Subtotal	24267	2094	8.63%
Bahrain	634	36	5.68%
Cabo Verde	1075	65	6.05%
Comoros	1423	114	8.01%
Guinea-Bissau	1801	77	4.28%
Maldives	1344	75	5.58%
Mauritius	1766	257	14.55%
Sao Tome and Principe	957	94	9.82%
Seychelles	2019	439	21.74%
Singapore	2415	293	12.13%
AIMS Subtotal	13434	1450	10.79%
Total	**764**	**104**	**1025**

Source: IUCN Red List, 2017.

REGIONAL

The Caribbean

The Caribbean region is made up of 23 SIDS. More than 70% of the region's 80-million inhabitants live in coastal areas, making the preservation of biodiversity, especially of coastal and marine ecosystems, particularly crucial. It is also one of the most tourism-dependent regions in the world, making the effects of climate change like beach erosion and hurricanes particularly devastating.

Despite its natural beauty, the Caribbean maintains only 11.3%t of its original biological habitat; the region, as a whole, also has the highest number of globally threatened species, at 703, according to the IUCN Red List.[43]

The main threats to biodiversity health in the Caribbean islands are:[44]

- Habitat destruction and fragmentation, due to agricultural, urban, tourism, and commercial development
- Overexploitation of living resources
- Predation by invasive alien species

Additionally, Caribbean coastal reefs have suffered progressive degradation, with only 10% of reefs retaining live coral cover. The Caribbean Challenge Initiative estimates that 75% of all coral reefs are facing medium-to-high levels of threat.[45] Reefs have been comprehensively flattened over the last four decades, losing the complex structures that attract reef fish, and contributing to the beach erosion that many of the Caribbean islands have seen. Coral bleaching in the Caribbean is the result of increased ocean temperatures, runoff and pollution, extremely low tides, and overexposure to sunlight. Not only does this affect the aesthetics of the coastal Caribbean environment, which affects the tourism industries, but the degraded marine environment and loss of microorganisms, like algae, threatens the fishing industry and the provision of seafood for local sustenance.[46]

There are 749 protected areas in the Caribbean Region, and high priority conservation species include the St. Vincent parrot, the St Lucia parrot, and the imperial parrot of Dominica.[47] The West Indian manatee, now protected under the Marine Mammal Protection Act, has faced increased threats due to commercial fishing and fatal collisions with boats.

WHAT CAUSES CORAL BLEACHING?

Source: NOAA's Coral Reef Conservation Program

Change in ocean temperature
Increased ocean temperature caused by climate change is the leading cause of coral bleaching.

Runoff and pollution
Storm generated precipitation can rapidly dilute ocean water and runoff can carry pollutants –these can bleach near-shore corals.

Overexposure to sunlight
When temperatures are high, high solar irradiance contributes to bleaching in shallow-water corals.

Extreme low tides
Exposure to the air during extreme low tides can cause bleaching in shallow-water corals.

The Pacific

There are 20 Pacific SIDS that, together, constitute less than 2% of the world's landmass. Beneath the marine surface—spread across the region's massive 32-million square kilometers of ocean area—lies over 7,500 volcanic islands and coral atolls.[48]

Abundant marine life in the Pacific has attracted many foreign fishing outfits, who often practice harmful techniques that endanger the health and sustainability of marine and wildlife. Overfishing, destructive methods, and non-selective equipment all have costly, grave side effects. According to the World Wildlife Fund, global demand for tuna and reef fish, like grouper and snapper, has created a spike in harvesting levels, from which fish populations do not have adequate time to recover. Declining fish stock is hard to combat as the most catch from foreign vessels goes unrecorded, as they move in-and-out of these oceans. It is argued that non-selective gear causes the most inadvertent harm by trapping and injuring millions of non-targeted species, such as whales, dolphins, sharks and marine turtles, in the process.

The East Melanesian Islands' Coral Triangle—a marine area including the waters of the Philippines, Papua New Guinea, Timor-Leste and the Solomon Islands- supports 75% of the near 600 coral species, 6-of-the-7 species of marine turtles, an estimated 2,000 species of reef fish, and large populations of commercial tuna.[49] These nations

contribute significantly to the global fishing industry. For example, the Solomon Islands, despite its small size, produced over 3% of the world's tuna market in 2012.[50]

The worsening effects of climate change are still the greatest threat to the Pacific SIDS. Warming waters are killing algae, the food of coral reefs, and further degradation is caused by high atmospheric CO2 level, of which the ocean absorbs one-fourth each year. This absorption increases the water's pH, a phenomenon known as ocean acidification, making it more challenging for reefs to calcify and form hard skeletons. Papua New Guinea is particularly affected by these stressors, with the area of reef threatened expected to rise from 55% to 100%.

The AIMS

The AIMS region is composed of SIDS that are scattered across Africa, the Indian Ocean, the Mediterranean, and the South China Sea; these islands include Bahrain, Cape Verde, Comoros, Guinea-Bissau, the Maldives, Mauritius, Sao Tome and Principe, the Seychelles, and Singapore.

Coastal and marine habitats in this region include beaches, dunes, coral reefs, and islands, which are protected from erosion by important coastal vegetation like mangrove forests. Due to their location, the AIMS islands are extremely ecologically diverse, featuring numerous biomes and ecosystems. Much of the flora and fauna in the AIMS region is endemic—they cannot be found anywhere else on Earth—and many species are currently endangered and face the threat of extinction in the coming decades.

The largest single threat to biodiversity in the AIMS is human exploitation of natural resources, which ranges from unsustainable agricultural practices and deforestation to illegal poaching. Mauritius, home to the famous Dodo- a symbol of species extinction—has continued to face exploitation of natural resources. The IUCN ranks the country as having the third most endangered flora in the world.

All endemic species in the Mascarenes are threatened, mainly due to loss of habitat from agricultural conversion and invasion from alien species. Hunting of endemic bats and marine turtles also occurs. In Seychelles, 54% of amphibians are threatened with extinction, ranking the country ninth in the world from threatened and extinct amphibians.

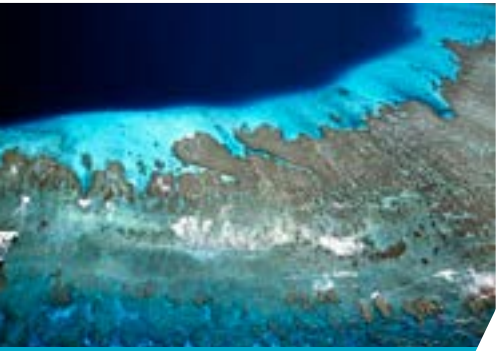
REGIONAL

Certain regions across the globe have experienced significant exploitation and damage, yet, many SIDS have taken measures to halt damages, reverse effects, and prevent future degradation.

Projects have been launched throughout the three SIDS regions:

- **The Caribbean Challenge Initiative (CCI)**
  A coalition of governments and private sector partners working to enhance the conservation of their marine and coastal resources by 20% by 2020.
- **The Micronesia Challenge**
  Aims, by 2020, to conserve a minimum of 30% of near-shore marine resources and 20% of the terrestrial resources through-out Micronesia.
- **The Coral Triangle Support Partnership (CTSP)**
  Brings together science and local expertise to provide practical conservation and resource management solutions to the nations within the Coral Triangle.

Marine Protected Areas (MPAs) are another important effort to preserve biodiversity across the most vulnerable small island nations. Given that SIDS are primarily dependent, across multiple strata, on the wellbeing of their natural environments, many of them have taken measures to mitigate the negative impact of climate change. For example, in Kiribati, commercial fishing has been prohibited inside of the Phoenix Islands Protected Area (PIPA), which is a UNESCO World Heritage Site, to stabilize their tuna population.



Coral reef in Fiji/Global Environment Facility, Flickr

Nevertheless, the conservation and sustainable use of natural capital, in the form of rich biodiversity, needs to become an integral component of sectoral economic development for all SIDS.[51] This would require correcting aboth policy and market failures.

KEY POINTS

1

Biodiversity is vital for the economies, environments, and cultures of all nations.

2

SIDS have some of the most diverse ecosystems in the world and are home to a host of rare endemic species.

3

SIDS are the most vulnerable to the effects of climate change and the harm that comes from the loss of biodiversity.[52]

4

The most serious threats to biodiversity come from unsustainable fishing and agriculture practices, pollution, poaching, and habitat destruction.

5

SIDS play a fundamental role in the conservation of biodiversity and have actively launched programs to protect their natural assets.

6

Combatting threats to biodiversity will require a global re-evaluation and restructuring of current economic policies, practices, and traditions.

7

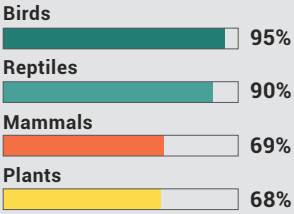
The cost of losing biodiverse ecosystems will be disproportionately larger than the cost of protecting them.

DID YOU KNOW?

Islands harbour **20%** of all plant, bird & reptile species

Islands make up **3%** of Earth's land area

EXTINCTIONS ON ISLANDS



1/3 of the world's conservation hotspots are islands

7 of the **10** coral reef hotspots surround islands

Many island species are endemic

12 of the **18** centres of marine endemism are around islands

ENDEMIC SPECIES

CARIBBEAN ISLANDS

13,000 plant species

170 amphibian species

469 reptile species

CUBA

18 mammal species

EASTERN MELANESIA

3,000 plant species

149 bird species

MAURITIUS

50% of all plants, mammals, birds, reptiles & amphibians **ARE ENDEMIC**

POLYNESIA & MICRONESIA

3,074 plant species

96 freshwater fish species

292 bird species

Source: Based on data from the Secretariat of the Convention on Biological Diversity and Conservation International.

DID YOU KNOW?

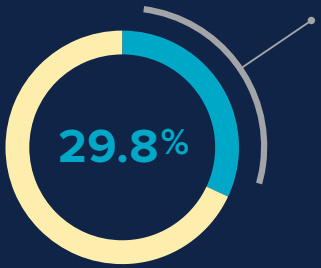
VALUE OF REEFS
in Guam

US$ **127.3** million

CORAL REEF-ASSOCIATED
spending

US$ **91,6** million
to St. Lucia's economy each year

89%
11% of GDP



US$ **9,6** billion
of the total US$ **29.8** billion
global net benefit of coral reefs

GLOBAL VALUE

US$ **184** /per visit
of coral reef recreation

Source: Convention of Biological Diversity, 2017.

AIMS The Atlantic, Indian Ocean, Mediterranean and South China Sea

Alien Species A species introduced outside its normal distribution, whose establishment and spread modify ecosystems, habitats, or other species.

Amphibian A cold-blooded vertebrate animal of a class that comprises frogs, toads, newts, salamanders, and caecilians.

Archipelago An extensive group of islands; a sea or stretch of water having many islands.

Arthropod An invertebrate animal, such as an insect, spider, or crustacean.

Atoll A ring-shaped reef, island, or chain of islands formed of coral.

Biodiversity The variety of plant and animal life in the world or in a particular habitat, a high level of which is usually considered to be important and desirable.

Biodiversity Hotspot A biogeographic region that is both a significant reservoir of biodiversity and is threatened with destruction.

Biome A large naturally occurring community of flora and fauna occupying a major habitat (e.g. forest or tundra).

BPoA Barbados Programme of Action

CEPF Critical Ecosystem Partnership Fund

Deforestation The action of clearing a wide area of trees, often destroying habitats in the process.

Demersal Refers to species living close to the ocean floor.

Ecotourism Tourism directed towards exotic natural environments, intended to support conservation efforts and observe wildlife.

Ecosystem A biological community of interacting organisms and their physical environment.

EEZ Exclusive Economic Zone

Endangered A species seriously at risk of extinction.

Endemic A species (e.g. plant or animal) native and restricted to a certain place.

Epipelagic Refers to species living among the top layer of the ocean.

Extinction A species having no living members and no longer in existence.

GLOSSARY

Fauna	The animals of a particular region, habitat, or geological period.
Flora	The plants of a particular region, habitat, or geological period.
Indigenous Species	Native species, whose presence is the result of only natural processes, with no human intervention.
Introduced Species	Exotic species that is not native to the area where it is considered introduced; instead it has been accidentally or deliberately transported to the new location by human activity.
Invasive Species	Non-native or alien species to the ecosystem, whose introduction likely causes economic or environmental harm.
IUCN Red List	(of Threatened Species) is a comprehensive inventory of the global conservation status of biological species.
MSI	Mauritius Strategy for Implementation of the Programme of Action for Small Island Developing States
Poaching	Illegally hunt or catch (game or fish) on land that is not one's own or in contravention of official protection.
PIPA	Phoenix Islands Protected Area
Reptile	A vertebrate animal of a class that includes snakes, lizards, crocodiles, turtles, and tortoises.
SAMOA Pathway	SIDS Accelerated Modalities of Action Pathway
SIDS	Small Island Developing States
Taxon/Taxa	A taxonomic group of any rank, such as a species, family, or class.
UNEP	United Nations Environment Programme
UN-OHRLLS	UN Office of the High Representative for the Least Developed Countries, Landlocked Developing Countries, and Small Island Developing States
WBG	World Bank Group
WWF	World Wildlife Fund

Source: Oxford English Dictionary

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MAP OF SIDS

UN MEMBERS

*Also Least Developed Country

Antigua and Barbuda
Bahamas
Bahrain
Barbados
Belize
Cabo Verde
Comoros*
Cuba
Dominica
Dominican Republic
Federated States of Micronesia
Fiji
Grenada
Guinea-Bissau*
Guyana
Haiti*
Jamaica
Kiribati*
Maldives
Marshall Islands
Mauritius
Nauru
Palau
Papua New Guinea
Samoa
Sao Tome and Principe*
Seychelles
Singapore
Solomon Islands*
St. Kitts and Nevis
St. Lucia
St. Vincent and the Grenadines
Suriname
Timor-Leste*
Tonga
Trinidad and Tobago
Tuvalu*
Vanuatu*

MAP OF SIDS

NON-UN MEMBERS / ASSOCIATE MEMBERS OF THE REGIONAL COMMISSIONS

American Samoa
Anguilla
Aruba
Bermuda
British Virgin Islands
Cayman Islands
Commonwealth of Northern Marianas
Cook Islands
Curacao
French Polynesia
Guadeloupe
Guam
Martinique
Montserrat
New Caledonia
Niue
Puerto Rico
Sint Maarten
Turks and Caicos Islands
U.S. Virgin Islands

The boundaries and names shown and the designations used on this map do not imply official endorsement or acceptance by the United Nations.

LISTS OF SIDS

UN Members (38)

16 **CARIBBEAN**
Antigua and Barbuda, Bahamas, Barbados, Belize, Cuba, Dominica, Dominican Republic, Grenada, Guyana, *Haiti, Jamaica, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, Trinidad and Tobago

9 **ATLANTIC-INDIAN OCEAN-SOUTH CHINA SEA (AIMS)**
Bahrain, Cabo Verde, *Comoros, *Guinea-Bissau, Maldives, Mauritius, *Sao Tome and Principe, Seychelles, Singapore

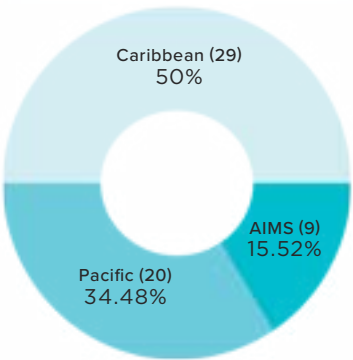
13 **PACIFIC**
Federated States of Micronesia, Fiji, *Kiribati, Marshall Islands, Nauru, Palau, Papua New Guinea, Samoa, *Solomon Islands, *Timor-Leste, Tonga, *Tuvalu, *Vanuatu

*Also Least Developed Country

Non-UN Members/Associate Members of the Regional Commissions (20)

13 **CARIBBEAN**
Anguilla, Aruba, Bermuda, British Virgin Islands, Cayman Islands, Curacao, Guadeloupe, Martinique, Montserrat, Puerto Rico, Sint Maarten, Turks and Caicos Islands, U.S. Virgin Islands

7 **PACIFIC**
American Samoa, Commonwealth of Northern Marianas, Cook Islands, French Polynesia, Guam, New Caledonia, Niue



58.

For a detailed list of references
please visit our website at
http://unohrlls.org/sids-numbers-2017

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