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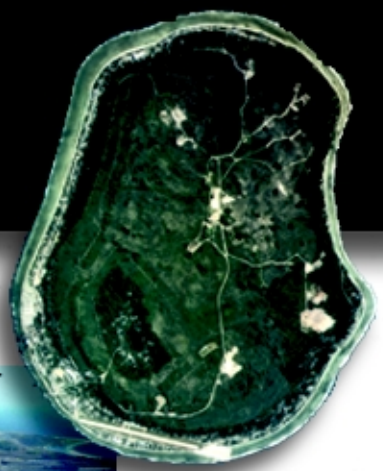
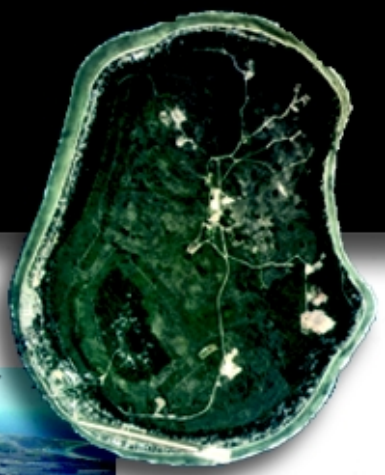


COUNTRY PROFILE

NAURU

SOPAC Secretariat Private Mail Bag Suva Fiji.
Tel: (679) 381 377 Fax: (679) 370 040 http: //www.sopac.org.fj/

SOPAC



Our Vision

The improved health, well being and safety of the Pacific and its peoples

The South Pacific Applied Geoscience Commission (SOPAC) is an independent, intergovernmental, regional organisation established by South Pacific nations in 1972, and dedicated to providing geotechnical services to the countries it serves. Its Secretariat is located in Suva, Fiji, and has about 40 professional and support staff.

SOPAC's work for its member countries focusses on three key areas; resource development; environmental geoscience; and national capacity development in the geosciences. To effectively deliver these services SOPAC maintains a regional data centre, provides information services, and offers technical and field services for specific project work.

THIS COUNTRY PROFILE WAS PRODUCED TO PROVIDE A SNAPSHOT OF THE CURRENT ISSUES FACED BY THE COUNTRY AND SOPAC'S ROLE IN ASSISTING COUNTRIES TO ACHIEVE SUSTAINABLE DEVELOPMENT

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Nauru: Our Future

"…development should be aimed at living our own preferred ways of life in a clean and sustainable environment …we see development as a process of guided change directed toward our preferred goals. A healthy environment, which is our responsibility to ourselves and our children, is also the cornerstone of the process of sustainable development."

Bernard Dowiyogo
President of Nauru. (1994)

Capital:	*Yaren District*
Population:	*11 300 (1999 est.)*
Land Area:	*21 sq. km*
Max. Height above Sea-level:	*70 m (location along plateau ring)*
Geography:	*Single raised coral island with phosphate plateau in centre*
EEZ:	*320 000 sq. km*
Climate:	*Tropical; tempered by sea breezes*
Rainfall:	*Variable with average annual rainfall of 1 500 mm*
Mean Temperature:	*29°C*
Economy:	*Revolves around phosphate mining*
GDP per Capita:	*US$ 3 450 (1998 est.)*
Currency:	*AUD$*
Energy Sources:	*Solar, biomass and wind*
Freshwater Sources:	*Groundwater, rainwater, imported, desalination*
Natural Hazards:	*Drought, cyclone, storm surge, coastal flooding, earthquake, landslide and tsunami*
Mineral Potential:	*On-land – phosphate; Offshore - unknown*
Languages:	*Nauruan, English*
Government:	*Republic, with parliamentary system*
SOPAC Membership:	*Full member since 1998*
Country Representative:	*Secretary for Foreign Affairs*
	Department of Foreign Affairs
	Government Offices Yaren District
	Tel: (674) 444 3191
	Fax: (674) 444 3105

Nauru

Nauru is a single raised coral island with a total land area of 21 sq km. Despite its small land area, Nauru has an EEZ that extends over more than 320 000 sq km. Its maximum height above sea level is approximately 70 m.

Aerial view of Nauru

The estimated population of Nauru in 1999[1] was 11 300. The population is widely scattered along the coastal fringe of the island and there is one inland village. The majority of the population is made up of indigenous Nauruans with the remaining being made up by I-Kiribatis, Tuvaluans, Chinese, Filipinos, Indians and Europeans.

The climate in Nauru is tropical with the rainy season from November to February. The mean annual rainfall is approximately 1 500 mm and average temperature is 29°C.

The economy of the country revolves around phosphate mining. Other primary production such as agriculture and fishing also provides for the daily needs of the Nauruans.

There are several resource and environmental issues, common to island nations, affecting sustainable development in Nauru. These include an array of issues from climate and sea-level variability, environmental degradation and pollution to resource management. More specific challenges to sustainable development include coastal erosion, water quality, water availability and sanitation. Sustainable management of resources such terrestrial minerals and renewable energy are other issues in Nauru's quest for development.

[1]SPC Demography Programme

Nauru has been a full member of the South Pacific Applied Geoscience Commission (SOPAC) since 1998. SOPAC is an independent, intergovernmental, regional organisation, which provides expert technical assistance, policy advice and information on the sustainable management of these non-living resources. SOPAC also contributes to a variety of geoscientific training and educational opportunities at all levels to increase the country's capacity in science and resource management. Additional assistance is made available by SOPAC through technical support for the establishment and maintenance of database information systems and for electronic exchange of information. Expertise in hazard assessment, disaster preparedness, mitigation and management is also provided.

Challenges to Sustainable Development and SOPAC's role in Nauru

For Small Island Developing States (SIDS), natural resource development and management holds the key to rapid economic development. Unwise exploitation of non-renewable resources and exploitation of renewable resources at a pace higher than the natural rate of replenishment could prove detrimental to the sustainable development plans of the country.

MINERALS

Nauru has been richly endowed with mineral deposits of phosphate, the mining of which has made it one of the wealthiest small island nations in the world. Phosphate has been exported from the country since 1907 but with an interruption during the War (1942-1947). In 1969 the Nauru Phosphate Corporation was established and took over. Previously, mining was

undertaken by a British company followed by a British/ Australian/New Zealand consortium, the British Phosphate Commission. Nauruan phosphate is of the highest grade in the world and continues to be a major foreign-exchange earner. However, deposits are expected to be depleted in the near future.

Even though phosphate mining is a major export earner in Nauru the removal of natural vegetation and topsoil has caused drastic land degradation. The landscape has been almost totally modified as a result of mining; this being widespread and apparent.

Environmental pollution, adverse social impacts and economic redistribution are the biggest concerns arising out of mining and mineral exploration. Air pollution, water pollution and deterioration of land quality are the primary damages inflicted by mining operations. Mining also leads to loss of green cover and diminished aesthetic appeal of natural surroundings, and renders the land unsuitable for other applications, even long after the closure of the mine.

Mineral resource development often leaves indelible scars on the fabric of traditional societies through the resultant change in lifestyle, perceptions and values that it inevitably effects. While displacement and compensation for externalities form a complex range of issues on their own, the assignment of pecuniary or economic value to communally owned properties like land has often lead to social disharmony. The loss of land deprives many of their traditional lifestyles and the resultant unemployment catalyses alcoholism, violence and crime in the affected societies. SOPAC understands the impact of these externalities on Nauru's goal of sustainable development and will attempt to address them while framing policies. Social cost benefit analysis and social and environmental impact assessments are advocated for any future mining projects in Nauru.

Aerial photograph showing remnants of mining

Capacity development in the member states is one of the top priorities of SOPAC. Training in the field for technical personnel from the member countries is an ongoing process with the aim of enhancing in-country capacity to undertake assessment studies and field surveys. This training is carried out through workshops and seminars and through the courses in the Earth Science and Marine Geology Certificate Programme, which has been undertaken for 21 years.

Ship loading phosphate

ENERGY

The Nauru Phosphate Corporation (NPC) is wholly government owned and is the sole power provider in Nauru, although it was established primarily for mining.

The whole population in Nauru has access to electricity, and there are a number of stand-alone generators that are used for back-up purposes.

Limited use is made of solar photovoltaic or solar hot-water systems, although with Nauru situated almost on the equator the climate and long hours of sunlight lends to this alternate form of renewable energy.

Diesel generators have been the traditional source of electrical energy for Nauru since the establishment of the mining activities. The NPC has an installed capacity of 15 MW (derated to 11.1 MW) with approximately 43% of the energy generated by NPC being used by the mining operation.

There is limited use of Liquified Petroleum Gas (LPG) on Nauru, in particular in the domestic sector. Hotels and restaurants also use LPG for cooking purposes, though to a limited extent. This situation has arisen

due to the long-term reliance on electricity as an energy source, which in the earlier days of the mining operation (pre-1990s) was free.

Oil storage tankers

Opportunities abound for the introduction of demand-side management and energy efficiency in Nauru, in particular in the government and domestic sectors where there is high usage of air conditioners, electric water heaters, electric water pumps and electrical appliances.

Indigenous energy resources in Nauru are limited solely to solar radiation and a small amount of biomass. However, as the electricity is supplied from diesel generation and has been abundantly available over the past 80 years, these other energy sources have not been extensively exploited. Due to Nauru's limited biomass resources it is unlikely that this could be considered to be a sustainable energy source for the future. Solar energy offers the best alternative, but considering the high usage of electrical appliances, such as air conditioners, refrigerators and stoves, etc., the viability of adopting a solar-replacement policy would need to be carefully evaluated from an economic point of view. In addition, the environmental aspects of battery import and disposal may also create additional problems.

Current demand in Nauru peaks around 8 MW. As the generating plant operated by NPC is relatively old, there is an immediate need to consider an upgrade of a number of the diesel generators. The alternative is to actively support and implement with the government a demand- side management (DSM) and energy efficiency program. The focus of this would be on conservative programmes, alternate fuels such as LPG and the utilisation of solar energy. The introduction of a tariff structure that reflects the true cost of electricity generation will also assist in ensuring the optimal and efficient use of electricity.

SOPAC's role in the energy sector began in 1999[2] when assistance was provided to the Nauru Government with the preparation of its National Communication. Nauru has endorsed the UNFCCC and is an active participant in the Pacific Islands Climate Change Action Program (PICCAP). One of the major objectives of the PICCAP is to enable participating countries to prepare their national communication under the framework of the UNFCCC. The preparation of the national communication is a new exercise to most of the participating Pacific Islands countries and most are experiencing difficulties and are in need of external assistance. Nauru requested SOPAC to assist in the drafting of its national communication.

At present SOPAC is also undertaking a Greenhouse gas inventory and national communication project for Nauru[3]. In addition, SOPAC is planning to conduct an energy conservation project, which aims to improve public awareness and energy efficiency[4].

WATER & SANITATION

Nauru has no surface freshwater resources apart from the Buada Lagoon. Most of Nauru's fresh water comes from a desalination plant installed in 1994, which produces about 1150 tonnes of water per day. The Nauru Phosphate Corporation (NPC) is responsible for the water supply (pumped/imported and through desalination) for distribution by water tankers to meet the domestic, hotel and commercial needs.

Limited use is made of the extensively available roof rainwater catchments. This is because the water is often contaminated with phosphate dust from the mining operation settling on the roofs. Maintenance of

[2]Task Profile 99.044
[3]Task Profile 99.043
[4]Task Profile 99.003

these storage systems is also very poor.

The only significant permanent freshwater resource is the groundwater lens. However, the pollution of this groundwater resource from leachates and human waste is one of the major problems in Nauru.

Also of concern is the discharge of raw sewage across the reef. The sources are sewage outfall pipes from individual septic tanks and cesspits.

Nauru became a SOPAC member country in 1998 and hence relatively little work has been carried out by SOPAC for the nation. However, several projects have been planned by SOPAC to help Nauru resolve some key challenges to sustainable development.

One of the projects SOPAC intends to carry out in Nauru is the development of a master plan for the Nauru water supply[5]. The objective of this proposed project is to ensure that the Nauru Government has reliable data to plan future developments with respect to the availability of fresh water.

Another study planned is the monitoring of groundwater wells on Nauru so that the potential for water supply and use of existing groundwater wells is better known[6]. Nauru's current water supply relies almost entirely on desalination. The Nauru Government realises the need for fresh water as part of its development plan. It is believed that groundwater wells could supplement existing freshwater sources significantly.

CLIMATE & SEA-LEVEL VARIABILITY

Global climate variability may be responsible for increasingly more-frequent and more-severe cyclones, interspersed with scorching droughts. The impact of this unpredictable climate has been harsh on ecosystems and coastal, terrestrial and marine biodiversity. Economically, the impact has translated into decreased agricultural yield, death of livestock, and decrease and loss of marine biodiversity.

Nauru could be considered to be in a far better position with respect to climate and sea-level change than a number of its Pacific island neighbours who have substantially larger low-lying land areas. Nauru has at least 80% of its land area well elevated.

However, until proven otherwise, it is very likely that Nauru will to some degree be vulnerable to climate variability. But it is difficult to predict the intensity of these threats now. A vulnerability assessment study carried out for Nauru has identified future activities would influence Nauru's sensitivity to climate change. The possible affected areas will be the coral reef and marine environment, coastal erosion, water resources, vegetation and human health.

COASTAL MANAGEMENT

Nauru rises from a sandy beach with a 19-km coastline encircling the island. There have been rapid changes in the coastal geography associated with increasing development. Coastal erosion is an increasing problem in Nauru due to the interruption of long-shore currents by development of boat channels, harbour facilities and the extension of the airport runway. In addition to this, the reef biota is destroyed by pollution resulting from concentrated stormwater, wastewater, sewage and runoff.

The soils of Nauru are also being continually eroded. Throughout the history of phosphate mining, all the

[5]Task Profile 99.001
[6]Task Profile 99.046

topsoil has been removed from the surface. Thus, the existing soil resource of Nauru is particularly precious and any incidence of erosion is of especially great concern.

Anibare port development

SOPAC proposes to carry out a coastal erosion-monitoring study on Nauru and advise on response strategies[7]. This project will include a coastal-zone hazard map and training and advice on effective and sustainable response strategies. An assessment of a boat and harbour facility at Anibare Bay was recently completed[8], and a technical report will be prepared advising on maintenance of the facility and options for alleviating erosion and loss of land from the development activity. Numerical analysis will also be done for the facility to examine performance and damage by the structures.

A nearshore bathymetric survey is also planned to map the outer reef of the island[9]. This will assist with the development of fish-aggregating devices (FADs) and assess coastal erosion problems attributed to small boat channel and harbour development.

STEPS INTO THE FUTURE: INFORMATION TECHNOLOGY & COMMUNICATION

For effective resource management and planning, the storage and processing of timely and accurate scientific data is critical. Island nations face the fundamental crisis of geographic isolation and high cost of communication between the various islands. Given the small size of these nations, technology providers are reluctant to supply cutting-edge technology because of poor economies of scale and difficulties in monitoring. Low human capital endowment further complicates the situation. These factors have remained a constraint in Nauru's pursuit of rapid growth. The weak human resource base has led to the dearth of skilled personnel to man certain key technical functions.

SOPAC has been assisting Nauru in improving its human capital base through training programmes, workshops, seminars and courses run at the University of the South Pacific. Improving its management systems and training personnel in information technology in the Pacific region has been another priority with SOPAC. SOPAC has been developing access to Internet services through commercial (Public Switched Telephone Networks) and non- commercial satellite services (PeaceSat). SOPAC has also been providing assistance in the development of Internet and Intranet services within the region. Training in the use of Geographical Information Systems (GIS) has also been provided in Nauru. Local officials have been trained in using GIS for remote-sensing (RS) development and in power utilities[10].

As a regional data centre, SOPAC has been compiling geographic data on Nauru.

The central part of the raised reef limestone island of Nauru showing an area previously mined for phosphate and now slowly becoming revegetated

[7]Task Profile 99.005
[8]Task Profile NR 99.045
[9]Task Profile 99.004

[10]Task Profile PG 98.009

Future Directions in Nauru

In future, SOPAC will continue its partnership with Nauru, to overcome the hurdles in the path of sustainable development. SOPAC will use its key 'ownership advantage' - the expertise in applied sciences - to help Nauru manage and develop its non-living resources sustainably.

SOPAC will further its partnership with Nauru in the development of appropriate legislation to manage coastal degradation. Phosphate is one of the most important mineral resources found in Nauru. In the future, policy formulation for the mining sector will be one of the key areas that SOPAC will develop as one of its core professional activities.

Sustainable development, conservation and management will be the guiding principles in the water and energy sectors. Policy development will be an activity in both these areas as well. Training programmes, workshops and seminars will be organised regularly to assist Nauru in creating a national capacity in geoscience.

Island systems management will be a future area of focus, given its ability to improve database management and decision-making processes. SOPAC intends to support the development of information technology and communication infrastructure in Nauru to achieve this.

By performing its functions as the specialised scientific organisation that it is, SOPAC has been addressing some of the fundamental factors that have impeded the development process.

Reference Materials

SOPAC provides access to a variety of information relating to Nauru. This can be accessed through its library database, PIMRIS or the Internet. SOPAC also holds at its Secretariat:

- Maps of Nauru
- Education/awareness Pamphlets
- General reference material on Nauru
- Project reports

Please refer to the Nauru Bibliography for SOPAC's full reference and material listing.

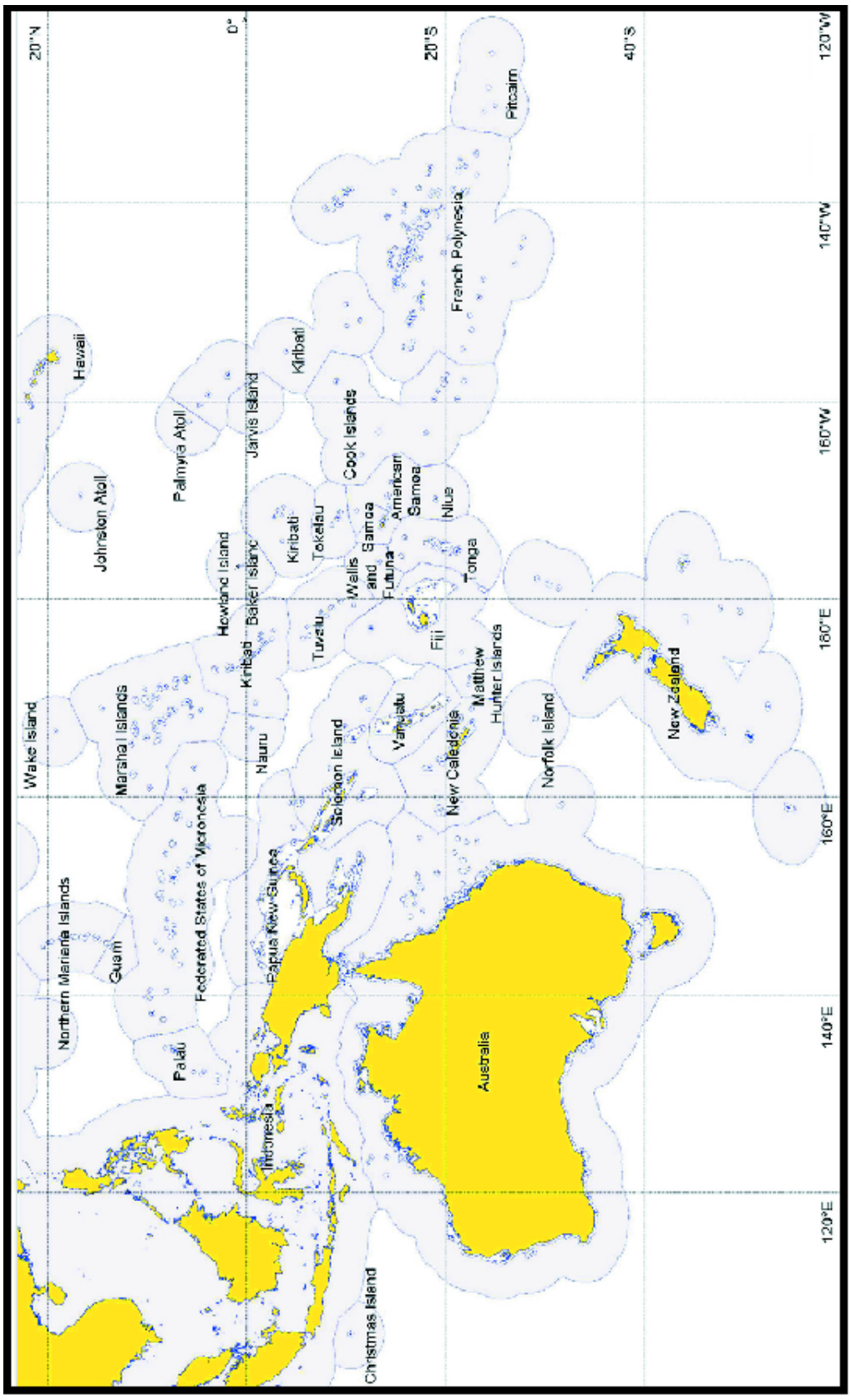
Coast of Nauru

For more information please contact:
The Librarian
South Pacific Applied Geoscience Commission
Private Mail Bag, GPO
Suva, Fiji Islands

Phone : (679) 381377, Fax : (679) 370040
Email : postmaster@sopac.org.fj
Website : www.sopac.org.fj

Issues and SOPAC's Responses for Further Development

ISSUES	CONSTRAINTS	RESPONSES FOR FURTHER DEVELOPMENT
Water & Sanitation	· Limited surface fresh water · Inadequate water catchment and storage facilities · Contamination of groundwater by leachates and human waste · Lack of public awareness on water conservation	· Development of resource policy and legislation · Advising on the improvement of infrastructure within the water and sanitation sector · Undertaking of pilot projects, research and feasibility studies · Increasing public awareness on sustainable water management through workshops
Coastal degradation	· Inappropriate coastal development · Uncontrolled mining causing loss of topsoil · Poor awareness of environmental impacts of coastal degradation	· Implementation of appropriate policies and legislation · Educating the local population about coastal degradation and management through workshops and field training
Minerals	· Inadequate scientific research to define full potential of resources	· Development of policies and legislation to minimise land degradation in phosphate mining
Energy	· Use of fossil fuels to generate electricity · Inadequate public awareness on alternative energy sources and management	· Identifying viable renewable energy sources · Development of appropriate energy policies · Enhancing the skills required by local staff for management and operation of the energy sector through workshops and appropriate training
Information Technology & Communication	· Limited availability and poor access to information · Lack of skilled personnel to manage the IT sector · Lack of relevant regional and local data · High costs	· Assisting in the development of Internet and Intranet in Nauru · Training of local staff in information technology and GIS/RS · Coordination, compilation and creation of standardised geographic datasets · Regional coordination and development of effective IT systems
Human Resource Development	· Weak human resource base · Limited financial and institutional resources · Limited expertise	· Conducting workshops and technical training programmes to improve national capacity in the geosciences · Running the Earth Science and Marine Geology course to improve the human resource base · Fellowship attachments



South Pacific Region Maritime Limits

SOPAC Member Countries: Australia, Cook Islands, Federated States of Micronesia, Fiji Islands, Guam, Kiribati, Marshall Islands, Nauru, New Zealand, Niue, Papua New Guinea, Samoa, Solomon Islands, Kingdom of Tonga, Tuvalu, and Vanuatu. French Polynesia and New Caledonia are Associate Members.