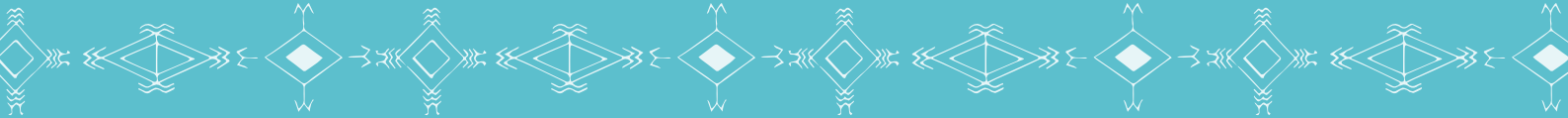




# SOLOMON ISLANDS STATE OF ENVIRONMENT REPORT 2019

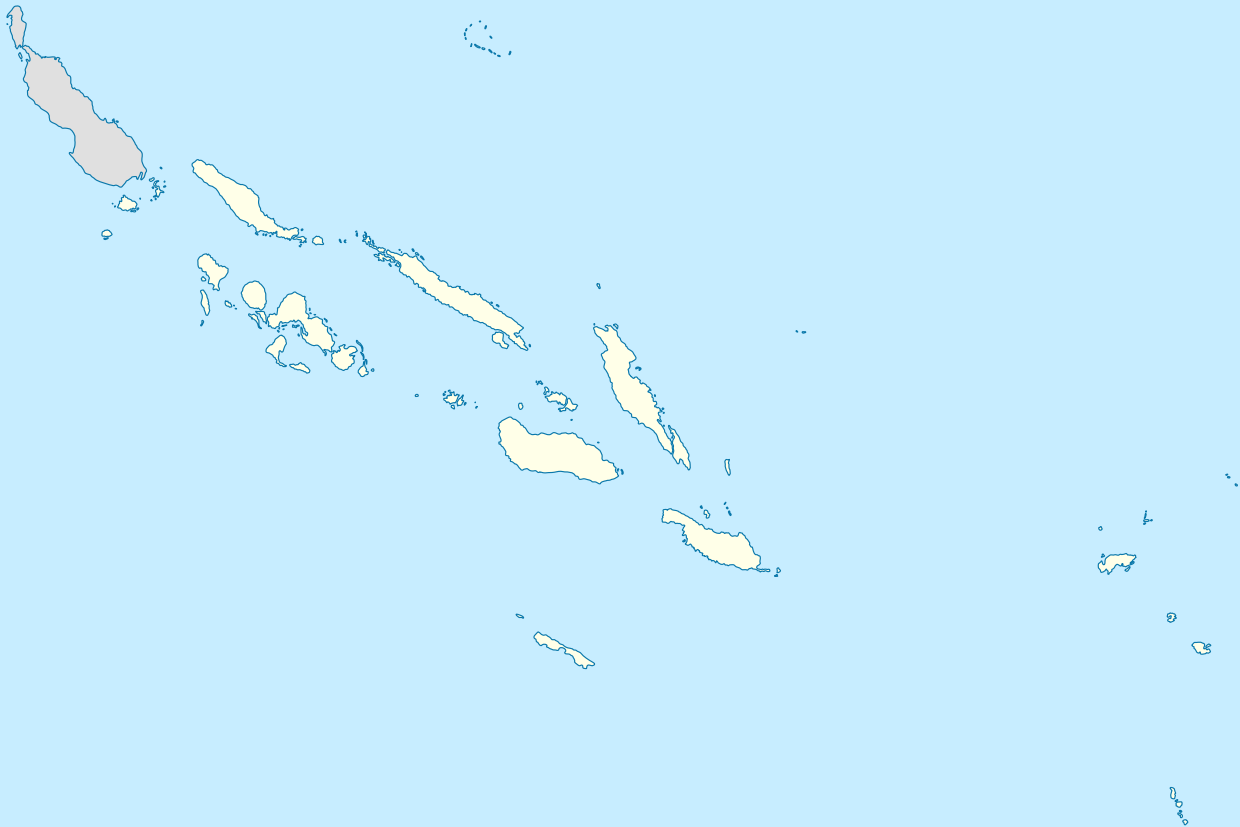




# SOLOMON ISLANDS STATE OF ENVIRONMENT REPORT

2019





#### **SPREP Library Cataloguing-in-Publication Data**

Solomon Islands State of Environment Report 2019. Apia, Samoa: SPREP, 2019.

156 p. 29 cm.

ISBN: 978-982-04-0834-0 (print)  
978-982-04-0833-3 (ecopy)

1. Environmental impact analysis – Solomon Islands.
  2. Environmental policy – Solomon Islands.
  3. Conservation of natural resources – Solomon Islands.
- I. Pacific Regional Environment Programme (SPREP).  
II. Title.

333.72099593 SOL

SPREP authorises the reproduction of this material, whole or in part, provided appropriate acknowledgement is given.

Cover photo: Tadhi Village on Buena Vista Island, Solomon Islands © Stuart Chape.

Other photos: Unless otherwise acknowledged, all photos are copyright SPREP.

Designed by: The Little Design Company, Wellington, New Zealand.

*An initiative of the African, Caribbean and Pacific Group of States funded by the European Union.*

*This document has been produced with the financial assistance of the European Union and the United Nations Environment Programme. The views expressed herein can in no way be taken to reflect the official opinion of the European Union or the United Nations Environment Programme.*



PO Box 240, Apia, Samoa  
+685 21929  
sprep@sprep.org  
www.sprep.org

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

# SOLOMON ISLANDS STATE OF ENVIRONMENT REPORT

2019



States funded by the European Union  
Caribbean and Pacific Group of  
An initiative of the African,

ACP MEAs 2



UN  
environment



SPREP  
Secretariat of the Pacific Regional  
Environment Programme

Inform  
Environmental Information  
for Decision Making



# CONTENTS



Acknowledgements	vi
Acronyms	vii
Message from the Premier	viii
Foreword from the Solomon Island Minister of Environment, Climate Change, Disaster Management and Meteorology	ix
Message from the Director General, SPREP	x

## **EXECUTIVE SUMMARY** **xi**

## **SECTION 1: INTRODUCTION AND READER'S GUIDE** **1**

Environmental Reporting in Solomon Islands	3
The 2008 and 2019 SoE Reports – Different Approaches	3
Methodology and Process	4
Thematic Areas	4
Drivers for Change in Solomon Islands	4
Reader's Guide to the 2019 State of Environment Report	5

## **SECTION 2: DRIVERS AND PRESSURES ON THE SOLOMON ISLANDS ENVIRONMENT** **11**

## **SECTION 3: STATE OF SOLOMON ISLANDS ENVIRONMENT, IMPACT AND RESPONSE** **19**

THEME 1: CULTURE AND HERITAGE	21
THEME 2: ATMOSPHERE AND CLIMATE	32
THEME 3: MARINE AND COASTAL	54
THEME 4: FRESHWATER	78
THEME 5: LAND	86
THEME 6: BIODIVERSITY	100
THEME 7: BUILT ENVIRONMENT	114



# ACKNOWLEDGEMENTS



The Solomon Islands 2019 State of Environment Report was led and developed by the Ministry of Environment, Climate Change, Disaster Management and Meteorology (MECDM), and the Secretariat of the Pacific Regional Environment Programme (SPREP). Content contributions were made by numerous representatives from government and NGOs. A local and an international consultant also assisted with gathering data and writing. There were many others not listed below, who also helped in the data gathering, analysis and design whom without their assistance, it would not have been possible to develop a report of this complexity and scope. Their contribution is greatly appreciated.

## **COORDINATION AND PLANNING**

### **Environment and Conservation Division**

Rosemary Apa  
Josef Hurutarau  
Wendy Beti

### **SPREP**

Paul Anderson  
Jope Davetanivalu  
Peter McDonald  
Julie Callebaut  
Sela Soaki-Simamao  
Whitney Isenhower

## **WRITING, ANALYSIS, DESIGN AND COMPILATION**

Peter McDonald – SPREP  
Julie Callebaut – SPREP  
Bruce Chapman – Consultant  
Wendy Beti – MECDM  
Edward Danitofea – MECDM  
Debra Kereseke – MECDM  
Phillip Riogano – MECDM  
Michael Suinao – MECDM  
Agnetha Vave-Karamui – MECDM  
Lagi Reupena – SPREP  
Emile Adams – SPREP

## **KEY CONTRIBUTORS**

### **CEMA – Commodities Export Marketing Authority**

George Tuke

### **GPPOL – Guadalcanal Plains Palm Oil Limited**

Malone W Palmer

### **HCC – Honiara City Council**

Ella Rizwold  
George Titiulu  
Grace Iakoba  
Joe Kelesi

### **IUCN – International Union for Conservation of Nature**

Veira T Pulekera

### **JICA – Japan International Cooperation Agency**

Tomoyuki Kogawa  
Mitsuko Nakamura  
Nishikawa Tatsuji  
Hamada Yoshinuke

### **MACBIO – Marine and Coastal Biodiversity Management in Pacific Island Countries**

Anja Nicolay-Grosse

### **MCT – Ministry of Culture and Tourism**

Andrew Houlia  
Emily Tavake  
Gregory Auta'a  
Laurie Leketo

### **MECDM – Ministry of Environment, Climate Change, Disaster Management and Meteorology**

Sammy Airahui  
Rosemary Apa  
Wendy Beti  
Peace Daefa  
Edward Danitofea  
Fredrick Dotho  
Enoch Fa'abasu  
Joe Horokou  
Joseph Hurutarau  
Melissa Horokou  
Nelly Kere  
Debra Kereseke  
Luke Mae  
Cynthia Misros  
Phillip Riogano  
Michael Suinao  
Jonathan Tafiariki  
Agnetha Vave-Karamui

### **MFMR – Ministry of Fisheries and Marine Resources**

Ivory Akao  
Rieka Kwalai  
Jan Oli-Pitu  
Joan Meseputu  
Paul Jay  
Francis Pituvaka  
Rosalie Masu  
Dr. Reuben Sulu

### **MHMS – Ministry of Health and Medical Services**

Bobby Patteson  
Jimmy Hilly

### **MID – Ministry of Infrastructure Development**

Steve Sae  
Benedict Teahui

### **MLHS – Ministry of Lands, Housing and Survey**

#### **Ckameron Willie**

Lizzie Tegū

### **MMERE – Ministry of Mines, Energy and Rural Electrification**

David Michael Natogga  
Michael Maehaka  
Jeremiah Kisi  
Joseph Ishmael  
Joshua Lavisi  
Gabriel

### **MOFR – Ministry of Forest and Research**

Arnold Augwarea  
Chris Ghiro Wagatora  
Ruvie Pitavoqa  
Myknee Sirikolo  
Cathy Unga  
Simon  
Emmanuel

### **MOFT – Ministry of Finance and Treasury**

Anna Pitaboe  
Raphael Aipaina  
Mathew Pitavato  
Anterlyn Tuzakana  
Douglas Kimi

### **MFAET – Ministry of Foreign Affairs and External Trade**

Trevor Ramoni

### **MPNS – Ministry of Police and National Security**

Ronny Horo  
Mary Alasia  
Patricia

### **MAL – Ministry of Agriculture and Livestock**

Hilda Wratten

## **UN ENVIRONMENT**

Sefanaia Nawadrea

## **UNDP**

Joanne Aihunu  
Jiye Suh



# ACRONYMS



<b>ADB</b>	Asian Development Bank	<b>NAPA</b>	National Adaptation Programmes of Action
<b>ANZECC</b>	Australian and New Zealand Environment Conservation Council	<b>NBSAP</b>	National Biodiversity Strategy and Action Plan
<b>ARMCANZ</b>	Agriculture and Resource Management Council of Australia and New Zealand	<b>NCD</b>	Non-Communicable Diseases
<b>BSI</b>	Biosecurity Solomon Islands	<b>NDS</b>	National Development Strategy
<b>CAUSE</b>	Community Access and Urban Services Enhancement	<b>NEMS</b>	National Environment Management Strategy
<b>CBD</b>	Convention on Biological Diversity	<b>NEPM</b>	National Environment Protection Measure
<b>CBRM</b>	community-based resource management	<b>NIP</b>	National Implementation Plan
<b>CBSI</b>	Central Bank of Solomon Islands	<b>NGO</b>	Non-Governmental Organisation
<b>CCA</b>	Community Conservation Area	<b>NRH</b>	National Referral Hospital
<b>CITES</b>	Convention on International Trade in Endangered Species	<b>NWMP</b>	National Waste Management and Pollution Control Strategy
<b>CLIP</b>	Commonwealth Marine Litter Programme	<b>ODS</b>	Ozone-Depleting Substance
<b>CMEP</b>	Commonwealth Marine Economies Programme	<b>PACCSAP</b>	Pacific-Australia Climate Change Science Adaptation Planning
<b>COT</b>	crown of thorns starfish	<b>PACWASTE</b>	Pacific Hazardous Waste Management Project
<b>CRB</b>	Coconut Rhinoceros Beetle	<b>PEBACC</b>	Pacific Ecosystem Based Adaptation to Climate Change Project
<b>CTATLAS</b>	Coral Triangle Atlas	<b>PCCSP</b>	Pacific Climate Change Scientific Programme
<b>CTI-CFF</b>	Coral Triangle Initiative on Coral Reefs, Fisheries and Food Security	<b>PIPAP</b>	Pacific Islands Protected Area Portal
<b>DDT</b>	Dichlorodiphenyltrichloroethane	<b>PIC</b>	Pacific Island Countries
<b>DPSIR</b>	Drivers, Pressures, State, Impact, Response	<b>PICT</b>	Pacific Island Countries and Territories
<b>EBA</b>	Endemic Bird Area	<b>PNG</b>	Papua New Guinea
<b>EEZ</b>	Exclusive Economic Zone	<b>POP</b>	Persistent Organic Pollutants
<b>EIA</b>	Environmental Impact Assessment	<b>PPPO</b>	Pacific Plant Protection Organisation
<b>EIS</b>	Environmental Impact Statement	<b>PV</b>	Photovoltaic
<b>FAD</b>	Fish Attracting Device	<b>QWQG</b>	Queensland Water Quality Guidelines
<b>FAO</b>	Food and Agriculture Organization of the United Nations	<b>R2R</b>	Ridge to Reef
<b>FFA</b>	Forum Fisheries Agency	<b>REDD</b>	Reducing Emissions from Deforestation and Degradation
<b>FRTU Act</b>	Forest Resources and Timber Utilisation Act	<b>RWASH</b>	Rural Water Sanitation and Hygiene
<b>GEF</b>	Global Environment Facility	<b>RSIPF</b>	Royal Solomon Islands Police Force
<b>GDP</b>	Gross Domestic Product	<b>SDGs</b>	Sustainable Development Goals
<b>GHG</b>	Green House Gases	<b>SIEA</b>	Solomon Islands Electricity Authority
<b>GMP</b>	Global Monitoring Plan Project	<b>SIG</b>	Solomon Islands Government
<b>HCFC</b>	Hydrochlorofluorocarbons	<b>SPREP</b>	Secretariat of the Pacific Regional Environment Programme
<b>HCM</b>	Honiara City Market	<b>SoE</b>	State of Environment
<b>IUCN</b>	International Union for Conservation of Nature	<b>SOLFRIP</b>	Solomon Islands National Forest Inventory Project
<b>JICA</b>	Japan International Cooperation Agency	<b>SST</b>	Sea Surface Temperature
<b>LEAF</b>	Learning and Ecological Activities Foundation for Children	<b>Tabu</b>	taboo, restriction
<b>MAL</b>	Ministry of Agriculture and Livestock	<b>ULAB</b>	Used Lead Acid Batteries
<b>MECDM</b>	Ministry of Environment, Climate Change, Disaster Management and Meteorology	<b>UN</b>	United Nations
<b>MFMR</b>	Ministry of Fisheries and Marine Resources	<b>UNFCCC</b>	United Nations Framework Convention on Climate Change
<b>MPA</b>	Marine Protected Area	<b>USD</b>	United States Dollar
<b>MFAET</b>	Ministry of Foreign Affairs and External Trade	<b>WASH</b>	Water, Sanitation and Hygiene
<b>MOFT</b>	Ministry of Finance and Treasury	<b>WCPFC</b>	Western and Central Pacific Fisheries Commission
<b>NAP</b>	National Adaptation Plan	<b>WHO</b>	World Health Organisation
		<b>WWF</b>	World Wildlife Fund for Nature



# MESSAGE FROM THE SOLOMON ISLANDS MINISTER OF ENVIRONMENT, CLIMATE CHANGE, DISASTER MANAGEMENT AND METEOROLOGY

For Solomon Islands we know that our country, our culture, and our economy all stand on the base of the natural physical environment. The country as a whole is concerned with environmental management. We cannot afford to ignore the signs of our environment being degraded. In addition to the strong public interest, it is also a requirement under our Environment Act for a State of the Environment Report (SoE) to be prepared at three-year intervals. The last SoE report was produced in 2008 so this new report is both welcome and long overdue.

The report tells us that there are significant pressures on our environment leading to environmental problems across all the thematic areas, as well as large gaps in the data that we should have to make sound decisions for the future. The report shows that some areas, such as offshore fisheries, are well managed while in other areas we clearly do not have sufficient resources to address the range of issues facing us. There are clear risks to our water quality, air quality, and biodiversity on land and in the sea. Together, these issues affect the livelihoods, health and wellbeing of our people.

Two areas that highlight the challenges we face in ensuring a sustainable future are the logging industry and management of Honiara. We know the logging industry can have adverse effects on water, soil, biodiversity and cultural values of our land. I note the example of our regional tuna fisheries which have many years of attention across the region to ensure that our fish stocks are managed for sustainability and for economic value. After many years of effort, we are now seeing the returns from this in a valuable, sustainable fishery with a strong emphasis on good data and compliance with fisheries regulations, and, importantly, a significant proportion of the value returned to Solomon Islands. I would like to see a similar approach with forestry, whereby we

work with donor partners to ensure sustainability, value, and minimising external environmental effects.

The second key area is the management of our capital, Honiara. Here we see the increase in urban population outgrowing the infrastructure for managing water, waste, sanitation and transport. These issues come together to present serious risks to health and wellbeing, especially from waterborne diseases and respiratory conditions. The move away from traditional diets shows up in increases in non-communicable diseases. These health trends are very worrying and need to be addressed in a way that focusses on the root causes in environmental management.

I wish to acknowledge the work by all involved in preparing the SoE, in particular the Environment and Conservation Division of the Ministry of Environment, Climate Change, Disaster Management and Meteorology (MECDM), Government ministries, Non-Government Organisations and our partner agency, the Secretariat of the Pacific Regional Environment Programme (SPREP). I look forward to incorporating the key recommendations into Solomon Islands' National Environmental Strategy (NEMS) and working with stakeholders including donor partners to address the key issues identified in this report.

Honorable Dr Culwick Togomana  
*Solomon Islands Minister of Environment, Climate Change,  
Disaster Management and Meteorology  
Honiara, Solomon Islands*



# MESSAGE FROM THE DIRECTOR GENERAL OF SPREP

The natural environment has always been part of Pacific island cultures. It has shaped and influenced our way of life over the centuries and as the primary source providing for our Pacific communities, it has fed, clothed and kept us safe over the years.

Despite its immense value, our environment is under growing pressure due to economic development, tourism expansion and the threat of global climate change. Therefore, it is important that we continue monitoring and maintaining the quality of our environment for future generations.

The 2019 Solomon Islands State of Environment (SoE) Report updates the last report completed in 2008. The report assesses seven themes as well as the baseline information for new and emerging environmental challenges.

This report places the emphasis on data-based conclusions and presents supporting evidence for all indicators.

The 2019 SoE Report is a new baseline for future reports and can help Solomon Islands with national, regional and international reporting obligations, including multilateral environmental agreements. This report has already informed

environmental planning and decision-making and has guided the development of the National Environmental Management Strategy.

SPREP is pleased to have partnered with the Solomon Islands Ministry of Environment Climate Change Disaster Management and Meteorology in developing this document, as well as the many other agencies and civil society organisations that contributed to the consultative process.

I would like to sincerely thank the individuals and all the government ministries and departments for their contributions. It is important that regular updates to this SoE Report are conducted to assess Solomon Islands' environmental conditions. I encourage you all to use this report to help track, manage, plan and report on natural resources and the environment.

Kosi Latu  
*Director General*  
*Secretariat of the Pacific Regional Environment Programme*



# MESSAGE FROM THE DIRECTOR OF ENVIRONMENT AND CONSERVATION DIVISION

It is with great pleasure that I introduce the Solomon Islands State of Environment Report. At the outset, it is important to note that the SoE is a mandatory requirement under section 8 of the Environment Act 1998. This is the third edition of the SoE produced for Solomon Islands, which represents almost a decade of data and information on the country's current state of knowledge about its environment, the major development issues threatening its environment and the ongoing efforts by the government to address these increasing pressures on our natural resources, in addition to the compounding factors of climate change and rapid population growth.

Production of the SoE is not an easy task. It is consultation intensive, and highly dependent on quality data and information, consequently, adequate resources must be available for it to be prepared on a timely basis. The SoE is a critically important stocktake exercise. The report enables the country to evaluate the trends in the use of its natural resources in light of the increasing exploitation of the country's natural resources, with attendant environmental and socio-economic issues and the uncontrollable pace at which this is happening. As a vehicle for promoting sustainable development, it is hoped that the analytical information the SoE provides will be used to design and inform policy decisions across the economic and productive sectors of government.

Production of the SoE involved not only collecting and synthesising a diverse range of data and information, but also presenting them in formats that can be easily understood. As such, I wish to thank all our partners for their contributions to the successful completion of this report. This aligns well with our intention to ensure that all our partners are fully engaged in this process. In particular, special mention and thanks must be accorded to SPREP for its support in securing funding and technical support including co-leading the production of the report. The involvement of my staff from the Environment and Conservation Division, Permanent Secretary of MECDM, and national partners in providing written inputs to inform certain sections of the report is also highly commended. This signifies and bears testimony to the degree of competence and level of professionalism already available to produce the report alone in years to come.

There are seven thematic areas covered in the SoE and these include Culture and Heritage, Atmosphere and Climate, Coastal and Marine, Freshwater Resources, Land, Biodiversity and Built Environment. Various key

and traditional indicators have been identified and used for each thematic area through the 'Drivers, Pressures, State, Impact and Response' (DPSIR) model. The PSR indicators proposed in the report are deemed most appropriate to the local context, as a basis to evaluate and better understand the interactions and relationships between human activities, the state of the environment conditions and their implications for improving strategic interventions at the political level. While acknowledging the limitations and challenges to garner and collate quality replicable data, the SoE by no means is deficient in high quality data as it is meant to be data driven. This is to ensure the report remains an important tool to guide decision-making at the highest level of natural resource governance and stewardship in our country.

The opportunity provided through the SoE formulation process was also used to draw attention to the implementation status of the Aichi Targets under the Convention on Biological Diversity, sustainable development goals (SDGs) and other multilateral environmental agreements (MEAs) the country is a Party to. All this entails reporting obligations on the part of government, and their integration with the SoE was a rational effort at synchronising the reporting process. We hope this approach will provide useful guidance in identifying relevant sources of data and information whether it be from government ministries, non-governmental organisations (NGOs), research institutions, researchers or other partners. There is going to be consistent and easily referenced material for future SoE reports.

Finally, since the SoE has been inspired and produced on a basis of shared responsibility for the environment, as witnessed by the collective efforts of stakeholders, we sincerely hope that it will inform the planning and decision-making processes of both government and non-government agencies including the private sector, NGOs and communities, to better manage and ensure a sustainable environment for Solomon Islands.

Joe Horokou  
*Director, Environment and Conservation Division*



# EXECUTIVE SUMMARY



The Solomon Islands State of Environment (SoE) Report presents an overview across seven thematic areas: Culture and Heritage, Atmosphere and Climate, Coastal and Marine, Freshwater Resources, Land, Biodiversity and Built Environment. The report uses the 'Drivers, Pressures, State, Impact and Response' (DPSIR) model to describe the environment. As far as possible the report is based on quantitative data relating to the state of the environment, supplemented by stakeholder input to describe causal relationships and environmental effects. The report presents:

- A description of key drivers and pressures on the environment
- An assessment of the current state of the environment
- A description of current responses and future recommendations for each thematic area

The intention is for the outcomes and recommendations to be put into action through the 2019 National Environmental Management Strategy (NEMS).

## ENVIRONMENTAL DRIVERS AND PRESSURES

There are a number of key drivers which create pressure on the environment of Solomon Islands:

- **Population growth:** The population has grown rapidly from less than 200,000 in 1976 to 515,870 as at the 2009 census. The rate of population growth peaked at 3.4% annually (1976–1986) but decreased to 2.3% in the ten years to 2009.
- **Economic development:** Economic development is expected to underpin national development goals for Solomon Islands, including poverty alleviation and raising the standard of living. In 2014, approximately 43% of GDP was derived from agriculture, forestry and fisheries, as well as industry (including mining, water etc). This shows the continuing importance of natural resources and ecosystem services in Solomon Islands economic development. There is also potential future development in these sectors, for example in the field of offshore mining.
- **Climate Change:** Pacific Islands Leaders are on record stating “that climate change presents the single greatest threat to the livelihood, security and wellbeing of Pacific people”. This applies in Solomon Islands, where long-term effects of changes in rainfall patterns, extreme events, sea level rise, and ocean acidification will continue to affect all aspects of life in Solomon Islands.

- **Traditional and contemporary values and lifestyles:** Environmental change is also influenced by people's attitudes and approaches towards issues such as environment, development, and the meaning of sustainability.

These high-level drivers of change underpin activities that place pressure on the environment and natural resources. These pressures apply across a range of sectors including use of natural resources (forestry, mining, agriculture, fisheries), and urban development.

## THE STATE OF SOLOMON ISLANDS ENVIRONMENT

### Theme: Culture and Heritage

The theme culture and heritage identified three indicators that will be used to observe the status and trends. They are (1) culture and traditional knowledge, (2) indigenous language and (3) traditional diets.

The House of Chiefs is deteriorating throughout Solomon Islands, though there are some efforts to revive the structures and their functions. Many *tabu* (taboo, restricted) sites have been destroyed by logging and there is an urgent need for their formal protection. Of the 76 languages of the Solomon Islands, three are extinct, eight are dying and eight are in trouble. The shift from traditional diets to those that are based on imported staples is associated with a rapid increase in diet and lifestyle related non-communicable diseases.

### Theme: Atmosphere and Climate

The theme on atmosphere and climate identified five indicators that will be used to observe the status and trends. They are (1) air quality, (2) ozone-depleting substances, (3) greenhouse gas emissions, (4) renewable energy sources and (5) physical climate.

Air quality in Solomon Islands is generally good, but there are localised problems in urban areas, related to biomass burning for cooking. Biomass burning is also linked to respiratory illness.

Greenhouse gas emissions from the energy sector increased from 192 Gg CO<sub>2</sub> equivalent in 2000 to 350 Gg in 2010. Renewable energy resources are expected to increase over the next two years resulting in reduced reliance on diesel generation. By 2025 the Tina hydropower project is expected to mitigate emissions of 91,244 tonnes



CO<sub>2</sub> equivalent. Use of ozone-depleting substances has tracked down in line with global commitments to phase out their use.

Solomon Islands is already experiencing the effects of climate change through trends of increasing temperature, decreasing precipitation, changing patterns of weather and extreme events, and accelerated coastal erosion due to rising sea levels. These changes in climate bring challenges across many sectors including agriculture, fisheries, biodiversity, water resources and people's health.

## Theme: Marine and Coastal

The theme on marine and coastal identified six indicators that will be used to observe the status and trends. They are (1) offshore tuna fisheries and by-catch, (2) marine species of special interest, (3) seagrass, mangrove and coral reefs ecosystem, (4) marine protected areas, (5) coastal fisheries and (6) coastal water quality.

Offshore fisheries focus on migratory tuna and are managed regionally. Solomon Islands has been influential in developing regional measures aimed at sustainability and compliance. The key regional tuna stocks are all currently determined as being not overfished but target reference points for ensuring economic sustainability are urgently required for most species. There is no substantial increase or decline in tuna catch of the three main species over the period 2013–2017. By-catch of protected species and species of special interest (e.g. sharks, turtles, marine mammals) has been declining. For example, annual catches of whales by the purse seine national fleet in the WCPFC area show a dramatic decline in false killer whale captures between 2013 to 2017, perhaps due to improved by-catch reduction methods or a declining whale population. Offshore fisheries provide a significant, and increasing, contribution to the Solomon Islands economy. In 2017 the European Union lifted its cautionary 'yellow card' on the Solomon Islands fishery, ensuring access to the important European market.

Marine turtles are harvested for traditional use in Solomon Islands, however there is also some illegal trade of these threatened marine reptiles. A few villages continue to hunt dolphins, and levels of dolphin removal are a concern for depletion of local populations. Data on dugongs and shark population size and status are currently a substantial gap. Overfishing has placed the economically important sea cucumber fishery in danger of collapse.

In 2000 mangroves covered an area of about 47,000 ha or almost 2% of the Solomon Islands total land area. Mangrove forests have declined by at least 27% between 1970–2000 but there have been no recent fine-scale assessments of mangrove loss. In 2004 seagrass meadows were determined to be in relatively healthy condition compared to many other regions globally, though sedimentation from logging activities was identified as a major threat at some locations. The Solomon Islands has the world's second highest coral species diversity, and in 2004 reefs and coral communities were generally in good condition.

In 2009 there were 113 active Marine Protected Areas, including the 157.8 km<sup>2</sup> Arnarvons Community Marine Conservation Area, the largest marine protected area in the Solomon Islands. A marine spatial plan is currently being developed for the Solomon Islands EEZ.

In contrast to the offshore fisheries, Solomon Islands inshore fisheries are poorly regulated. Juveniles are overrepresented in markets for most commercially important species, suggesting widespread overfishing. Baseline data collected at markets can form the basis of measuring recovery of fish stocks following management measures.

While coastal water quality is another important data gap in the Solomon Islands, there is anecdotal evidence of poor quality due to logging activities and poor waste management in some locations.

## Theme: Freshwater Resources

The theme on freshwater resources identified two indicators that will be used to observe the status and trends. They are (1) access to fresh water and (2) water quality.

The majority of households in Solomon Islands do not have access to an improved water supply. Only 35–40% of rural communities have access to basic drinking water. In 2013 88% of health facilities did not have access to a functioning water supply.

Uncontrolled sediment runoff is a significant environmental issue at many logging sites. The catchments surrounding the Gold Ridge mine in Gaudalcanal have elevated levels of turbidity, metals and arsenic that are above safe guidelines. Further, arsenic in the overfull Gold Ridge mine tailings dam also presents an ongoing threat to the environment. Faecal contamination of bore water from overflowing septic tanks is a widespread issue in Solomon Islands.

## Theme: Land

The theme on Land identified four indicators that will be used to observe the status and trends. They are (1) livestock production, (2) area under cultivation (3) forest harvest and (4) mining.

Key livestock subsectors in Solomon Islands are pigs, poultry, honeybees, and cattle. There is interest in diversification into development of other species such as sheep and goats. The livestock industry, particularly cattle numbers, have declined significantly from a total national herd of around 25,000 in 1975 to just over 3,000 in 2005.

In 2016 about 7.8% or 2176 km<sup>2</sup> of Solomon Islands land area was cropland. Dominant crop types were mixed subsistence agriculture, followed by coconut, mixed crops (including coconut overstory) and palm oil. Between 2000–2016 there was a 1% increase in the area of cropland.

Forestry is an important industry contributing about 10% to Solomon Islands GDP. However, forest harvesting is



occurring at around 20 times the sustainable rate and log exports have increased from less than 500,000 tons in 2002 to 2.5 million tons in 2016.

Mining contributed less than 1% to Solomon Islands GDP in 2014. In 2018 the total area of active leases was 96 km<sup>2</sup> and there were 30 prospecting licences. The major mining products have been gold and bauxite and investigations have been carried out in relation to other minerals such as nickel.

## Theme: Biodiversity

The theme on Biodiversity identified three indicators that will be used to observe the status and trends. They are (1) invasive species (2) threatened and endemic terrestrial species and (3) forest cover.

The Solomon Islands is a global hotspot of biological endemism and one of the most biodiverse countries in the Pacific. However, the unique biological values of the Solomon Islands are under threat from a variety of sources.

There are a large number of invasive species in the Solomon Islands, many of which have adverse effects on the environment and economy. For example, a new biotype of Coconut rhinoceros beetle is an imminent threat to the livelihoods and economy of Pacific Islanders reliant on coconut, oil palm and other palms.

Currently, none of Solomon Islands terrestrial area is formally protected under current legislation, while 3% of the land area is managed for conservation but not formally protected. This is well short of the Aichi target of 10% terrestrial areas protected by 2020.

Solomon Islands has 24 bird and 16 mammal species listed as threatened on the IUCN Red List. Unsustainable and poorly regulated logging is by far the most important threat to most of these and other threatened flora and fauna.

In 2016 forests accounted for approximately 90.15% of Solomon Islands land area, with about 55% of this being undisturbed. Annual tree cover loss in the Solomon Islands has increased dramatically between 2001 and 2017, particularly 2013–2017.

## Theme: Built Environment

The theme on built environment identified four indicators that will be used to observe the status and trends. They are (1) waste generated and disposal, (2) energy, (3) sanitation and (4) health.

In the capital Honiara, estimates show a nearly 50% increase in waste generated per person between 1990 (0.62 kg/person/day) to 2017 (0.95 kg/person/day). This, coupled with an increasing population, has led to an estimated threefold increase in waste generated. The 2009 census data showed that the dominant waste disposal methods across most provinces were backyard and sea dumping, while burning was also prevalent. Across all of Solomon Islands only 5% of households had their waste collected by government services.

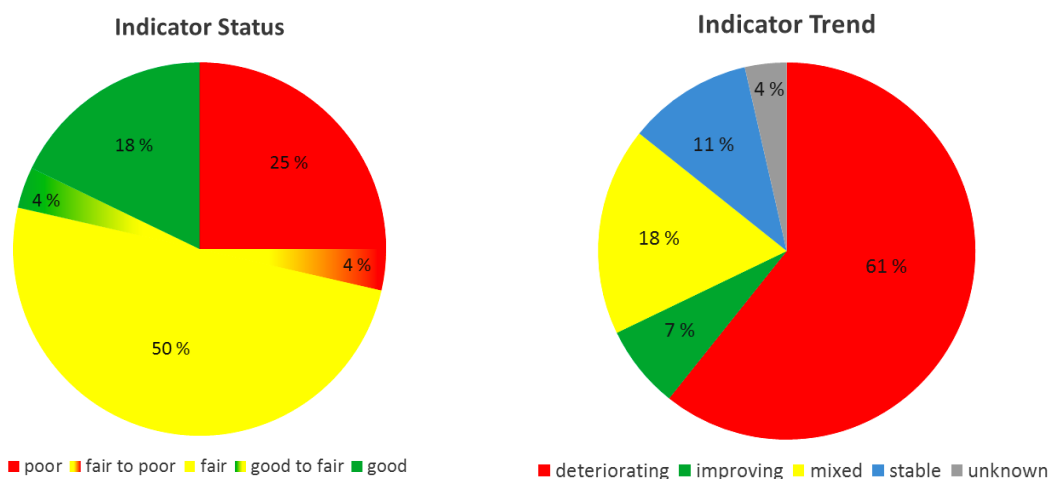
In 2009 only 15% of the Solomon Islands population had access to electricity. At the same time, per capita electricity use was 142 kWh, 354 kWh below the average use for Melanesia and >7000 kWh below the Pacific average. There is a positive relationship between GDP and per capita energy consumption and thus, as the Solomon Islands continue to develop, there will likely be an increase in energy consumption.

In 2009 approximately 45% of urban households and only 3% of rural households had access to private flushing toilets. In 2016 80% of rural households (>300,000 people) used open defecation compared with 13% of rural households (~50,000 people) with access to improved sanitation that hygienically separates human excreta from human contact. The 2016 data provide an important baseline on which to evaluate actions aimed at improving access to improved sanitation in the Solomon Islands.

The incidence of acute respiratory infection and skin diseases has substantially increased over the period 2013–2017. The increasing incidence of acute respiratory infection may indicate deteriorating air quality and the increase in skin diseases could be associated with a growing population and lack of access to adequate sanitation facilities. Malaria is still prevalent in the Solomon Islands despite efforts to eradicate the disease and there are periodic large-scale outbreaks.

## CONCLUSION AND OVERALL RECOMMENDATIONS

Half of the environmental indicators that were evaluated in this report, are in a “fair” state, with a quarter being in a “poor” state (Figure 1). “Good” indicator states are noted for air quality and ozone-depleting substances. Renewable energy sources and physical climate also have a “good” status, but with a deteriorating trend. Offshore tuna fisheries and by-catch are in a “good” status with a stable trend.



**FIGURE 1.** Left: % of indicators in each status category, Right-% of indicators in each trend category.

The majority of the environmental indicators (61%) show a deteriorating trend (Figure 1). Ozone-depleting substances and access to freshwater are the only 2 indicators with an improving trend.

Examples of two issues which would benefit from a coordinated national response are:

- The forestry sector, due to the recent history of barely controlled logging and the damaging impacts for land, water and biodiversity, as well as its economic importance.
- The urban centre of Honiara, where inadequate infrastructure contributes to a range of adverse environmental and health effects.

Detailed recommendations are provided for each of the thematic areas and indicators. Please refer to Table 1 for an overview.

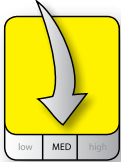
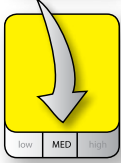

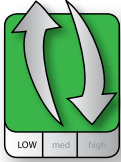
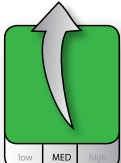





Photo © Stuart Chape





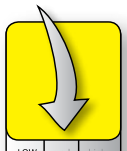
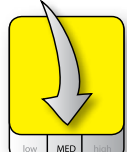


**TABLE 1.** Summary Themes, Indicators, Status and trends and Response & Recommendations of the Solomon Islands SoE 2019.

THEME	INDICATORS	STATUS AND TRENDS	RESPONSE & RECOMMENDATIONS
CULTURE AND HERITAGE	Culture and Traditional Knowledge		<ul style="list-style-type: none"> <li>• Pass the Traditional Knowledge Expression of Culture Bill and Traditional Governance Bill aimed at protecting heritage/cultural sites.</li> <li>• Use Environment Data Portal as central database for cultural data.</li> <li>• Incorporate cultural concepts and practices and language into National Curriculum Syllabus.</li> </ul>
	Indigenous language		<ul style="list-style-type: none"> <li>• Incorporate cultural concepts and practices and language into National Curriculum Syllabus.</li> <li>• Document languages that are threatened and becoming extinct.</li> </ul>
	Traditional diet		<ul style="list-style-type: none"> <li>• Increase space for vegetable markets.</li> <li>• Ensure affordable wholesome food for the local population.</li> <li>• Regulate imported and locally manufactured processed food.</li> <li>• Organise promotion of traditional food national events.</li> </ul>
ATMOSPHERE AND CLIMATE	Air quality		<ul style="list-style-type: none"> <li>• Develop national air quality standards and monitoring systems (ensure proper equipment is in place).</li> <li>• Implement emissions regulations for industries.</li> <li>• Invest in renewable energy and energy efficient technology.</li> <li>• Air, land and sea transport vehicle emissions regulation developed and enforced.</li> <li>• Expand and improve public sea and land transport.</li> <li>• Legal framework to limit waste burning.</li> <li>• Proper solid waste management practices – burning, collection and disposal.</li> <li>• Promotion of on-grid and off-grid electrification.</li> <li>• Promote alternatives to open biomass burning for cooking (example, kiko oven and kiko stove).</li> <li>• Note: Material Safety Datasheets put in place to address gas inhalation caused by improper management of toxic gasses.</li> </ul>
	Ozone-depleting substances		<ul style="list-style-type: none"> <li>• There is close observance on entry of ODS and ODS-containing equipment into the country.</li> <li>• Develop an accurate database of ODS consumers, ODS imports and consumption for continuous monitoring.</li> <li>• Develop minimum standards and legislation on the type of air-conditioning and refrigerators imported into the country.</li> </ul>
	Greenhouse gas emissions		<ul style="list-style-type: none"> <li>• Continue to monitor emissions across all sectors.</li> <li>• Develop renewable energy and energy efficiency measures.</li> <li>• Develop measures to control emissions from forestry logging.</li> <li>• Land and Crop Management – through adjusting methods of managing land and growing crops.</li> <li>• Improve Green House Gas Inventory for Solomon Islands.</li> <li>• National Waste Management and Pollution Control Strategy implemented.</li> </ul>
	Renewable energy sources		<ul style="list-style-type: none"> <li>• Continue to monitor emissions across all sectors.</li> <li>• Develop renewable energy and energy efficiency measures to reduce emissions.</li> <li>• Set clear targets on renewable energy interventions in the new energy policy.</li> <li>• Encourage Private Sector partnerships promoting renewable technology.</li> <li>• Put in place standards and monitoring systems on renewable energy appliances.</li> <li>• Waste Management systems to be put in place for renewable energy appliances.</li> <li>• Encourage use of renewable energy technology.</li> <li>• Put in place a guideline on securing customary land for big energy projects. This guideline needs to cover awareness, negotiation, etc.</li> <li>• Invest in renewable energy of all sizes to solve electricity accessibility to communities.</li> <li>• Invest in capacity building on renewable energy maintenance and sustainability.</li> </ul>
	Physical climate		<ul style="list-style-type: none"> <li>• Develop national and regional climate profile with a monitoring system put in place.</li> </ul>




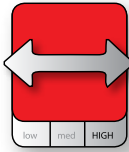
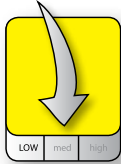
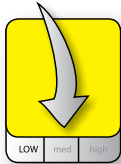



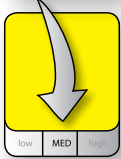
THEME	INDICATORS	STATUS AND TRENDS	RESPONSE & RECOMMENDATIONS
-------	------------	-------------------	----------------------------

COASTAL AND MARINE	Offshore tuna fisheries and by-catch		<ul style="list-style-type: none"> <li>• Fisheries Management Act 2015 and regulations provide basis for fisheries controls and their enforcement.</li> <li>• Improve electronic monitoring reporting on the fishing industry for management.</li> <li>• Solomon Islands tuna fisheries are guided by an active Tuna Management and Development Plan (TMDP), currently under review, and Tuna Harvest Strategy and other regional tuna fisheries management frameworks.</li> <li>• Solomon Islands through the Ministry of Fisheries is currently reviewing its Tuna Management and Development Plan. Harvest strategy for the key tuna species is ongoing work and it is vital to consider the economic benefits, employment, catch and effort, and the overall development of our domestic tuna fishery.</li> <li>• 'Ocean12' process has identified a set of priorities for Integrated Oceans Governance which are to form the basis for a National Oceans Policy.</li> <li>• Implement Solomon Islands National Ocean Policy.</li> <li>• Implement IUU measures.</li> <li>• Consider Ocean Act under the Ocean12, that will consider legislation for deep sea development.</li> </ul>
	Marine species of special interest		<ul style="list-style-type: none"> <li>• The Pacific Islands Regional Marine Species Programme 2013–2017, contains detailed Action Plans for marine turtles, whales and dolphins and dugongs.</li> <li>• Fisheries Management (Prohibited Activities) Regulations 2018 were officially gazetted, making dugongs, prohibited to hunt throughout the Solomon Islands.</li> <li>• Under the Fisheries Management Act 2015 and Fisheries Management Regulations 2017, certain species used for traditional activities or purposes are exempted, including dolphin harvest for cultural purposes.</li> <li>• More research - consider sedentary, and deep-sea habitats as marine species of interest (Reference MACBIO data on geomorphological data – the seamounts and hydrothermal vents are habitats for the sedentary and other deep-sea organisms).</li> <li>• Identify and establish migratory paths (whales and turtles).</li> <li>• Take into account procedures used in prospecting for minerals and gas (e.g. air guns).</li> <li>• Develop enabling legislation for deep sea mining and prospecting developments.</li> <li>• Complete and finalise management plans for turtles, dugong, dolphin and crocodiles.</li> <li>• Complete and finalise beche-de-mer/sea cucumber management plan.</li> <li>• Promote species conservation programmes.</li> </ul>
	Seagrass, mangrove and coral reef ecosystems		<ul style="list-style-type: none"> <li>• Conduct a national Rapid Ecological Assessment for key ecosystems including remote sensing for distribution and coverage.</li> <li>• Work towards a national baseline for seagrass and mangroves through remote sensing and follow-up ground assessments.</li> <li>• Strengthen monitoring of status of seagrass, mangroves and coral reefs.</li> <li>• Improve reporting and updating of ecosystem health and status by NGO partners and projects.</li> <li>• Strengthening EIA for habitat protection and management development consent process including loss of habitat and secondary impacts.</li> <li>• Promote education sustainable resource management practices around overharvest.</li> <li>• Promote EABM, CBRM, R2R initiatives or programmes.</li> <li>• Support establishment of MPAs, LMAs and <i>tabu</i> areas.</li> <li>• Dugong and seagrass conservation and management strategy.</li> <li>• Develop coral reef management plan.</li> <li>• Continue Implementation of Coral triangle initiative on coral reefs, fisheries and food security and community-based resource management for food security.</li> <li>• Complete and finalise Coral/Coral reef/Coral sand and gravel management plans (consider exploitation) – current coral survey conducted by MFMR.</li> <li>• Implement COT eradication programme.</li> <li>• Explore “Blue Carbon” ecosystems opportunities.</li> <li>• Implement REDD programme for mangrove protection.</li> </ul>
	Marine protected areas		<ul style="list-style-type: none"> <li>• Promote and support establishment and management of marine protected or management areas.</li> <li>• Finalise and implement the national scaling strategy for community-based resource management (CBRM).</li> <li>• Regularly update records on marine protected areas via PIPAP, Environment Data portal, CTATLAS and World Database of Protected Areas system.</li> <li>• Improve spatial data management capacity across SIG (MECDM and MFMR).</li> <li>• Finalise the SI National Plan of Action for community-based resource management (CBRM).</li> <li>• Complete and implement marine spatial plan and its legal framework.</li> <li>• Implement NBSAP - target of 15% MPAs.</li> <li>• Support coastal protection under the Environment, Fisheries and Protected Areas Acts.</li> <li>• Track management effectiveness of marine protected areas (management effectiveness tracking tool for areas).</li> </ul>



THEME	INDICATORS	STATUS AND TRENDS	RESPONSE & RECOMMENDATIONS
COASTAL AND MARINE	Coastal fisheries		<ul style="list-style-type: none"> <li>• Implement sales or import restrictions on vulnerable and iconic species and species important to ecosystem maintenance.</li> <li>• Implement size limits and gear restrictions (mesh sizes, hooks) for overfished species.</li> <li>• Implement a temporal restriction on sales during known spawning times for important species.</li> <li>• Repeat baseline market surveys at 5-10 year intervals.</li> <li>• Deploy new FADs.</li> <li>• Implement the National Fisheries policy 2019-2029.</li> <li>• Implement National Ocean Policy.</li> </ul>
	Coastal water quality		<ul style="list-style-type: none"> <li>• Developers are required to establish baseline coastal water quality and monitor/remediate any adverse effects.</li> <li>• Enforce Environment Act and regulations for coastal developments.</li> <li>• Implement the National Waste Management and Pollution Control Strategy.</li> <li>• Monitoring programme for Honiara coastal waters.</li> <li>• Improve capacity of the ECD and other responsible authorities (shipping, ports, city councils, provincial governments) for regulating and monitoring water quality standards.</li> </ul>
FRESHWATER	Access to freshwater		<ul style="list-style-type: none"> <li>• Solomon Islands RWASH Strategic Plan 2015-2010 2020 outlines targets and strategies to increase the access to improved water supplies from 35% of the population in 2014, to 52% in 2019 and 97% in 2024.</li> <li>• WATSAN Policy.</li> </ul>
	Water quality		<ul style="list-style-type: none"> <li>• Implement ongoing monitoring programme for all Prescribed Developments in Gold Ridge mine catchment to ensure the ecosystem services of food and water for local communities continues to be safe.</li> <li>• Development proposals must have conditions imposed to ensure that any impacts to water quality are within acceptable levels.</li> <li>• Development of national standard for freshwater quality.</li> <li>• Develop baseline for water quality in Solomon Islands.</li> <li>• Develop a National Water Safety Management Plan.</li> </ul>
LAND	Livestock production		<ul style="list-style-type: none"> <li>• The Solomon Islands Agriculture and Livestock Sector Policy 2015–2019 promotes sustainable smallholder and commercial livestock development.</li> <li>• Manage environment effects of livestock production.</li> <li>• Environment Management Plans put in place for livestock production.</li> </ul>
	Area under cultivation		<ul style="list-style-type: none"> <li>• The Solomon Islands Agriculture and Livestock Sector Policy 2015–2019 includes extensive proposals to enhance agricultural production and manage its environmental effects.</li> </ul>
	Forest harvest		<ul style="list-style-type: none"> <li>• Strengthen enforcement for logging companies held responsible for reforestation responsibilities under the logging license, including site remediation, and environmental monitoring.</li> <li>• Record of logging shipments to be put in place.</li> <li>• Cultural and heritage significant sites are protected.</li> <li>• Logging licenses cannot be extended without application for new permit and full assessment/management of environmental effects.</li> <li>• Capacity building training for forest officers to strengthen monitoring and enforcement.</li> <li>• Develop multipurpose updated forestry inventory.</li> <li>• Government to strengthen its support financially and technically on logging monitoring and enforcement.</li> <li>• All logging proposals must undertake the EIA process required under the Environment Act before issue of logging license. This is to be strengthened.</li> <li>• Review and increase logging license fees and keep in a separate account for the Forestry sector.</li> <li>• Strengthen collaboration between bio-security port/customs security measures on logging machinery imported.</li> <li>• Review of fines and penalties on breaches of the Forest Act.</li> </ul>
	Mining		<ul style="list-style-type: none"> <li>• Review of Mines and Minerals Act needs to involve landowners and harmonise with the Environment Act.</li> <li>• Prepare village disaster risk plans with simulation exercises for communities living downstream from the tailing dam.</li> <li>• Upgrade laboratories with sufficient equipment for testing to meet international standards.</li> <li>• Develop environment standards to address mining operation environment discharges.</li> <li>• Strengthen public hearing process in all mining operations as required under the EIA process.</li> <li>• Strengthen capacities of mining regulators in monitoring and enforcement.</li> <li>• Strengthen awareness on mining approval process with resources owners.</li> <li>• Develop a Mining EIA Guideline. This is to reflect the EIA process for mining and to the stage of mining operation closure which will cover post-mining rehabilitation processes.</li> </ul>



THEME	INDICATORS	STATUS AND TRENDS	RESPONSE & RECOMMENDATIONS
BIODIVERSITY	Invasive species		<ul style="list-style-type: none"> <li>Support passage and implementation of the Biosecurity Bill (2013).</li> <li>Develop and implement an invasive species national strategy under the Biosecurity Act.</li> <li>Support implementation of the programme of action set out in the NBSAP (Target 10, Actions 10.–C).</li> </ul>
	Terrestrial areas managed for conservation		<ul style="list-style-type: none"> <li>Implement relevant NBSAP targets relating to protected areas, including the target of 10% terrestrial area protected by 2020 (Target 12; Actions A - F).</li> <li>Support the establishment and declaration of terrestrial protected areas under the Protected Areas Act 2010, FTRU Act, and other national legislation or ordinances that promote terrestrial protected/conservation areas. Approve four pending applications for protected areas.</li> <li>Establish protected area network based on the Key Biodiversity Areas, Ecologically and Biologically Significant Areas.</li> <li>Implement the GEF5 and proposed GEF6 Projects which promote sustainable land-use planning, sustainable forestry management and the establishment and management of protected areas.</li> <li>Review and update the Protected Areas Act 2010 and its regulations (2012) to address gaps in enforcement (fines, incentives for rangers/inspectors and management committees).</li> <li>Promote sustainable land-use planning at national, provincial and community level.</li> <li>Enforce (and update/revise) Town and Country Planning Act.</li> </ul>
	Threatened and endemic terrestrial species		<ul style="list-style-type: none"> <li>Establish and manage terrestrial protected areas, particularly in lowland rainforest, under the Protected Areas Act 2010.</li> <li>Implement education actions outlined in the NBSAP under 'Theme 2: Species conservation'.</li> <li>Implement invasive species management outlined in the NBSAP under 'Theme 4: Management of invasive species and genetically modified organism'.</li> <li>Develop, promote and support implementation of threatened and endangered species conservation and management programmes.</li> <li>Establish monitoring programmes for priority threatened species.</li> <li>Promote sedentary farming practices e.g. organic farming.</li> <li>Enforce the wildlife protection and management Act (Amendment 2017).</li> </ul>
	Forest cover		<ul style="list-style-type: none"> <li>Improved environmental governance in forestry to ensure sustainability of hardwood industry.</li> <li>Enforcement and alignment of Forestry Act and Environment Act.</li> <li>Work towards reviewing the Forestry Act.</li> <li>Discourage expansion of logging outside of approved 'logging concession areas' without further assessment.</li> <li>Work towards NBSAP target of 10% terrestrial area protected by 2020.</li> <li>Implement REDD+ activities.</li> <li>Strengthen EIA for the forestry sector.</li> <li>Revise Environment Act and its regulations (EIA, monitoring of forestry developments and enforcement).</li> <li>Harmonise natural resource legislation for protection of the forest (environment sensitive).</li> <li>Promote polluter-pays based policies.</li> <li>Expand Forest rehabilitation, re-forestation and enrichment planting to enhance forest carbon stocks.</li> <li>Promote downstream processing of timber and ban round-log exports.</li> <li>Require logging companies to prepare forest rehabilitation plan and conduct monitoring for these plans.</li> </ul>
BUILT ENVIRONMENT	Waste generated and disposal		<ul style="list-style-type: none"> <li>Fund and implement National Waste Management and Pollution Control Strategy 2017-2026.</li> <li>Conduct waste characterisation surveys.</li> </ul>
	Energy		<ul style="list-style-type: none"> <li>The Solomon Islands Energy Policy 2014 set out policy-driven targets including: <ul style="list-style-type: none"> <li>Access to grid-connected electricity in the urban areas increased to 80% by 2020.</li> <li>Access to electricity in rural households and institutions increased to 35% by 2020.</li> </ul> </li> <li>Make clean energy available and affordable.</li> </ul>
	Sanitation		<ul style="list-style-type: none"> <li>RWASH Policy 2014.</li> <li>RWASH Strategic Plan 2015.</li> </ul>
	Health		<ul style="list-style-type: none"> <li>Strengthen awareness of health risks and prevention measures.</li> <li>Improve waste management practices.</li> <li>Build more spaces for physical activities.</li> <li>In urban areas, increase the amount of green space.</li> </ul>

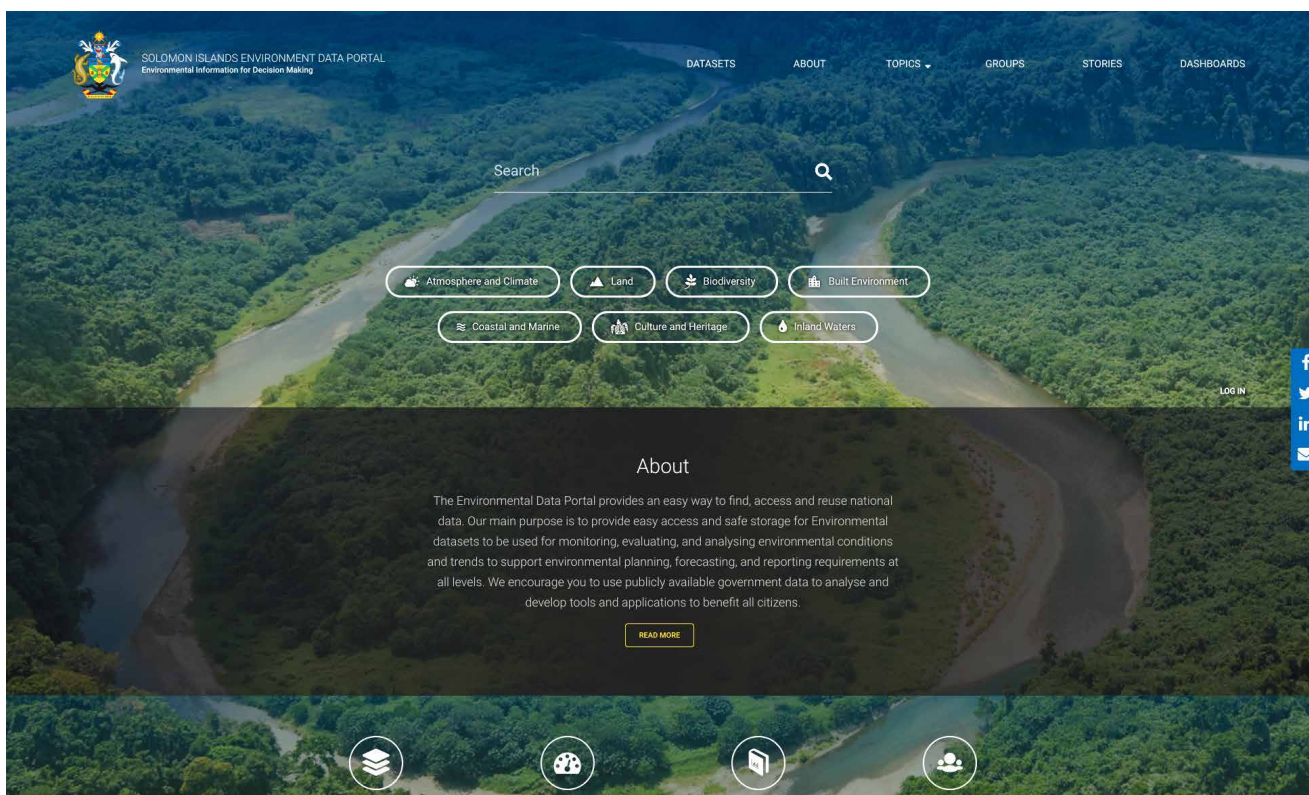
## ENVIRONMENTAL DATA MANAGEMENT

There are some serious gaps in the SoE report primarily due to a lack of data and proper documentation in most of the areas that were assessed. Recent, up-to-date datasets or reports were sometimes unavailable or not easily accessible or shared.

Knowledge and understanding are important for driving and bringing about informed decision-making. The project, *Building National and Regional Capacity to Implement Multilateral Environmental Agreements by Strengthening Planning and the State of Environmental Assessment and Reporting in the Pacific*, referred to as the **Inform project**, recognises the need for this data-driven decision-making. The project establishes a Pacific island network of national and regional data repositories and reporting tools to support the monitoring, evaluation, and analysis of environmental information, which supports environmental planning, forecasting, and reporting requirements.

From 2017–2021, Inform will work in the Cook Islands, Federated States of Micronesia, Fiji, Kiribati, Republic of the Marshall Islands, Nauru, Niue, Palau, Papua New Guinea, Samoa, Solomon Islands, Tonga, Tuvalu, and Vanuatu. The Global Environment Facility contributes 4.3 million USD to the Inform project, which is implemented by UN Environment and executed by SPREP.

The Solomon Islands now has an online and open source ‘Solomon Islands Environment Data Portal’. The portal can be accessed online via the following link: <https://solomonislands-data.sprep.org/>. This portal can be a resource for uploading, storing and sharing data in a central place, thus facilitating the process for compiling and analysing data when writing future SoE reports, NEMS and other policies.







# **INTRODUCTION AND READER'S GUIDE**





Tanapari Island, Guadalcanal, Solomon Islands. © Stuart Chape







After an initial discussion of drivers for change and pressures on the environment, the report addresses a series of key environmental thematic areas. For each thematic area, the environmental state and trend is identified against an agreed set of measurable indicators, and recommendations developed for future action to manage environmental impacts. The assessment is based as far as possible on the data available for each of the indicators. Key benefits of this approach are:

- Indicators that can be tracked over time
- Recommendations from the SoE can be drawn into a National Environmental Management Strategy (NEMS) to guide government action for addressing key issues.

## METHODOLOGY AND PROCESS

This report was developed during 2018–2019 through several stages:

- SPREP conducted an Inception Mission in early 2018 to promote engagement across government agencies and develop an initial set of indicators as well as gather data sets and relevant reports.
- In July 2018 a series of sector-based workshops addressed each of the thematic areas to validate data sources and review indicators.
- In November 2018 an initial draft set of thematic reports was reviewed in detail (using a 'write-shop' process) and advice provided on data gaps and interpretation.
- A final draft report was provided to government agencies for comment in Sep 2019 and finalised in October 2019 before being put to Parliament for adoption.

The consultation process outlined above involved multiple government agencies along with independent experts and representatives from the private sector, non-government organisations and civil society.

## THEMATIC AREAS

The seven thematic areas are:

1. **Culture and Heritage**
2. **Atmosphere and Climate**
3. **Coastal and Marine**
4. **Freshwater**
5. **Land**
6. **Biodiversity**
7. **Built Environment**

While the thematic areas are separate sections in the SoE, it is important to recognise that there are extensive linkages between the thematic areas that require coordinated responses between sectors and agencies.

## DRIVERS FOR CHANGE IN SOLOMON ISLANDS

Solomon Islands lies in the tropical western Pacific roughly between latitudes 5°S and 12°S, and longitudes 152°E and 170°E. Solomon Islands comprises nine provinces each with its own provincial government: Central, Choiseul, Guadalcanal, Isabel, Makira-Ulawa, Malaita, Rennell and Bellona, Temotu and Western. Solomon Islands consists of a double chain of six major islands as well as over 900 smaller islands, atolls and reefs with over 5000 kilometres of coastline. The islands range from large rugged and mountainous to small bare sand and coralline atolls. The islands contain a diversity of landforms and life forms. These natural resources are central to Solomon Islands' culture and peoples, and provide income, livelihoods and cultural resources.

At the same time Solomon Islands' geographic location in the Pacific Ring of Fire and cyclone zone makes it very vulnerable to natural disasters and extreme events. This vulnerability is exacerbated by its low socio-economic status which has placed it on the UN list of Least Developed Countries. The population of 515,800 (2009) is growing at 2.4% while human development indices and per capita income are some of the lowest in the Pacific. More than 80% of the population reside in low vulnerable coastal rural areas relying heavily on subsistence agriculture and fishing for food and income. Most coastal and inland villages do not have access to electricity and roads and government services to the rural areas are often limited.

Previous SoE reports have shown that Solomon Islands environment and heritage is under increasing threat from a number of sources, including economic development, and global climate change. These factors need to be managed to ensure sustainability into the future. This section highlights several key drivers affecting the state of environment in Solomon Islands.



# READER'S GUIDE TO THE 2019 STATE OF ENVIRONMENT REPORT

## How to read the report

The SoE condenses a large amount of information on various aspects of the environment into a readable and actionable report. Given the broad spectrum of topics covered, the report has been broken into themes for ease of reading and synthesis. Symbols were designed for each indicator to summarise the State, Trend and Confidence in each assessment (see below).

## Guide to the symbols used

This 2019 SoE integrates many data sources and expert opinions. While more data and knowledge have been generated since the 2008 SoE, significant data gaps remain. There may not be enough information available to make quantitative assessments of the state of an environment for every indicator using, for example, an index of 1 -10, or a quantitative threshold figure, that could be compared across themes. Consequently, a generic index was developed that used expert opinions and best available data to inform 'Status' ratings of either 'Good', 'Fair', and 'Poor'.

Assessment symbols summarise the 'State' of each indicator (Figure 3). 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 2 provides a guide to interpret the symbols and explains how the symbols were derived.

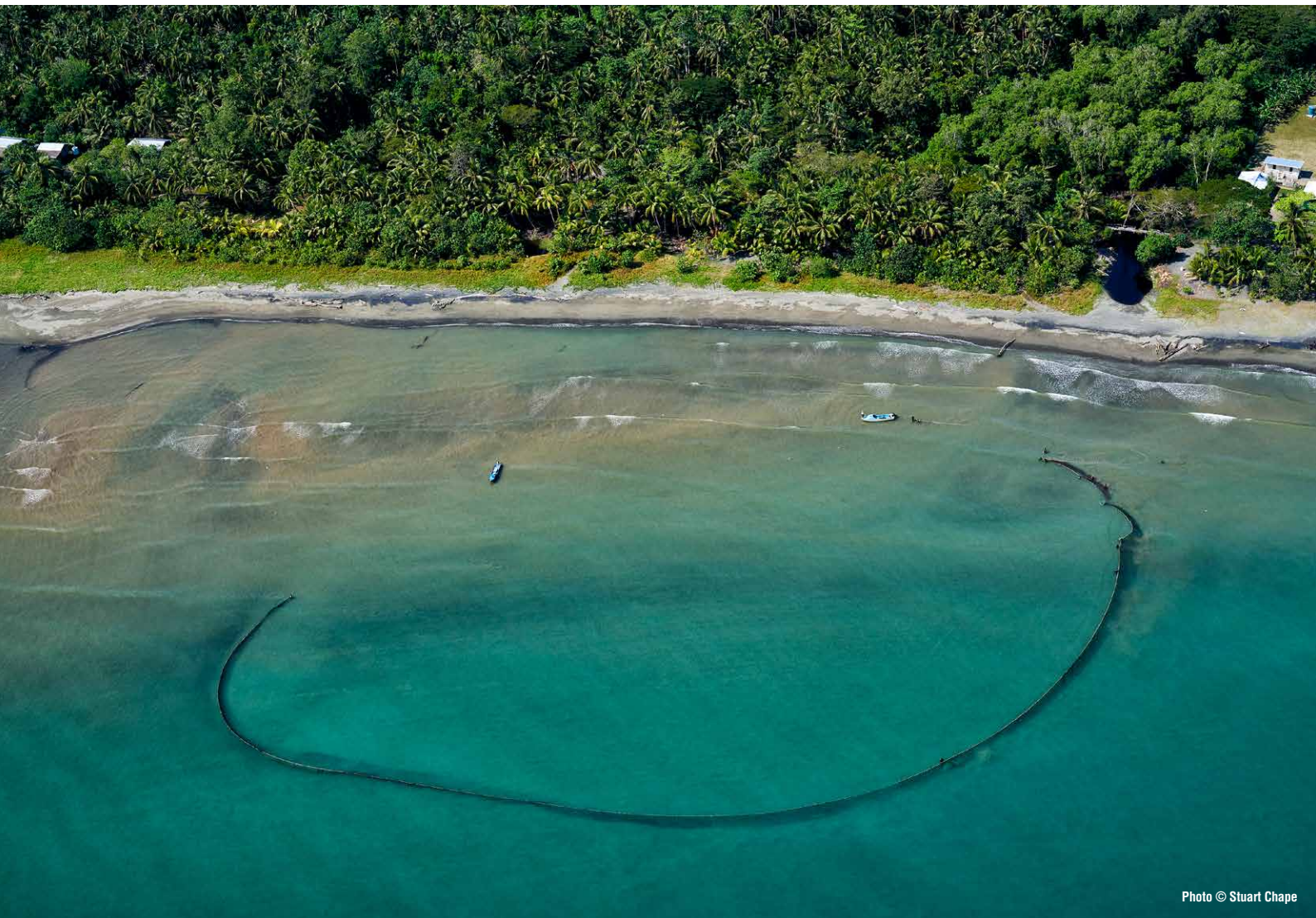


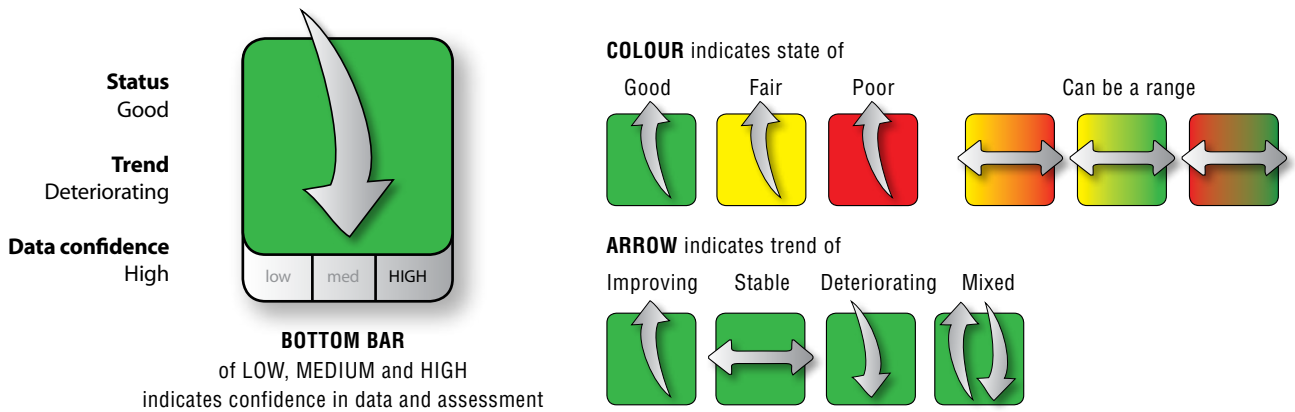
Photo © Stuart Chape



**TABLE 2.** Guide to interpreting the indicator symbols

	CATEGORY	DESCRIPTION	HOW IS IT DERIVED?	SYMBOL EXAMPLE
<b>State</b> (can be a range)	<b>GOOD</b>	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, 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.	
	<b>FAIR</b>			
	<b>POOR</b>			
<b>Trend</b>	<b>IMPROVING</b>	The state of the environment related to the indicator is getting better.	Trends show a significant increase, or based on weight of evidence that indicators are improving.	
	<b>DETERIORATING</b>	The state of the environment related to the indicator is getting worse.	Trends show a significant decrease, or based on weight of evidence that indicators are worsening.	
	<b>STABLE</b>	The state of the environment related to the indicator shows no detectable change.	Trends show no significant increase or decrease, or, based on weight of evidence that indicators are stable.	
	<b>MIXED</b>	The state of the environment related to the indicator shows a mixed trend; some worse, some better, some better and some stable	Used primarily for sub-topics with multiple indicators, or in cases where data shows two distinct trends.	
	<b>UNDETERMINED</b>	The state of the environment related to the indicator is unclear.	Insufficient data available to generate trend.	
<b>Confidence</b>	<b>HIGH</b>	Confidence in the data and assessment process is high.	Trusted and comprehensive time series and/or national level data sources are used to determine confidence trend.	
	<b>MEDIUM</b>	Confidence in the data and assessment process is medium.	Data is derived from many sources, and is not always consistent, with some extrapolation necessary.	
	<b>LOW</b>	Confidence in the data and assessment process is low.	Data is very coarse and outdated, and limited to single country sites.	





**FIGURE 3.** Explanation of the indicator symbol

## Sustainable Development Goals

The Sustainable Development Goals (SDGs), otherwise known as the Global Goals, are a universal call to action to end poverty, protect the planet and ensure that all people enjoy peace and prosperity. The SDGs provide clear guidelines and targets for all countries to adopt in accordance with their own priorities and the environmental challenges of the world at large. The goals are interconnected – often the key to success on one will involve tackling issues more commonly associated with another.

Throughout this report, the SDGs and their targets are linked to the different indicators using the symbols below (Figure 4).



**FIGURE 4.** Overview Sustainable Development Goals



## Aichi Biodiversity Targets

The Strategic Plan for Biodiversity 2011–2020, under the Convention on Biological Diversity (CBD), consists of five strategic goals, including 20 Aichi Biodiversity Targets (Table 3). The Aichi targets are linked to relevant indicators in this SoE using the symbols below.

**TABLE 3:** Overview of Aichi Biodiversity Targets

Goal A: Address the underlying causes of biodiversity loss by mainstreaming biodiversity across government and society	
	By 2020, at the latest, people are aware of the values of biodiversity and the steps they can take to conserve and use it sustainably.
	By 2020, at the latest, biodiversity values have been integrated into national and local development and poverty reduction strategies and planning processes and are being incorporated into national accounting, as appropriate, and reporting systems.
	By 2020, at the latest, incentives, including subsidies, harmful to biodiversity are eliminated, phased out or reformed in order to minimise or avoid negative impacts, and positive incentives for the conservation and sustainable use of biodiversity are developed and applied, consistent and in harmony with the Convention and other relevant international obligations, taking into account national socio economic conditions.
	By 2020, at the latest, Governments, business and stakeholders at all levels have taken steps to achieve or have implemented plans for sustainable production and consumption and have kept the impacts of use of natural resources well within safe ecological limits.
Goal B: Reduce the direct pressures on biodiversity and promote sustainable use	
	By 2020, the rate of loss of all natural habitats, including forests, is at least halved and where feasible brought close to zero, and degradation and fragmentation is significantly reduced.
	By 2020, all fish and invertebrate stocks and aquatic plants are managed and harvested sustainably, legally and applying ecosystem based approaches, so that overfishing is avoided, recovery plans and measures are in place for all depleted species, fisheries have no significant adverse impacts on threatened species and vulnerable ecosystems and the impacts of fisheries on stocks, species and ecosystems are within safe ecological limits.
	By 2020, areas under agriculture, aquaculture and forestry are managed sustainably, ensuring conservation of biodiversity.
	By 2020, pollution, including from excess nutrients, has been brought to levels that are not detrimental to ecosystem function and biodiversity.
	By 2020, invasive alien species and pathways are identified and prioritised, priority species are controlled or eradicated, and measures are in place to manage pathways to prevent their introduction and establishment.
	By 2015, the multiple anthropogenic pressures on coral reefs, and other vulnerable ecosystems impacted by climate change or ocean acidification are minimised, so as to maintain their integrity and functioning.



### Goal C: To improve the status of biodiversity by safeguarding ecosystems, species and genetic diversity



By 2020, at least 17 per cent of terrestrial and inland water, and 10 per cent of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well connected systems of protected areas and other effective area-based conservation measures, and integrated into the wider landscapes and seascapes.



By 2020, the extinction of known threatened species has been prevented and their conservation status, particularly of those most in decline, has been improved and sustained.



By 2020, the genetic diversity of cultivated plants and farmed and domesticated animals and of wild relatives, including other socio-economically as well as culturally valuable species, is maintained, and strategies have been developed and implemented for minimising genetic erosion and safeguarding their genetic diversity.

### Goal D: Enhance the benefits to all from biodiversity and ecosystem services



By 2020, ecosystems that provide essential services, including services related to water, and contribute to health, livelihoods and well-being, are restored and safeguarded, taking into account the needs of women, indigenous and local communities, and the poor and vulnerable.



By 2020, ecosystem resilience and the contribution of biodiversity to carbon stocks has been enhanced, through conservation and restoration, including restoration of at least 15 per cent of degraded ecosystems, thereby contributing to climate change mitigation and adaptation and to combating desertification.



By 2015, the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization is in force and operational, consistent with national legislation.

### Goal E: Enhance implementation through participatory planning, knowledge management and capacity building



By 2015, each Party has developed, adopted as a policy instrument, and has commenced implementing an effective, participatory and updated national biodiversity strategy and action plan.



By 2020, the traditional knowledge, innovations and practices of indigenous and local communities relevant for the conservation and sustainable use of biodiversity, and their customary use of biological resources, are respected, subject to national legislation and relevant international obligations, and fully integrated and reflected in the implementation of the Convention with the full and effective participation of indigenous and local communities, at all relevant levels.

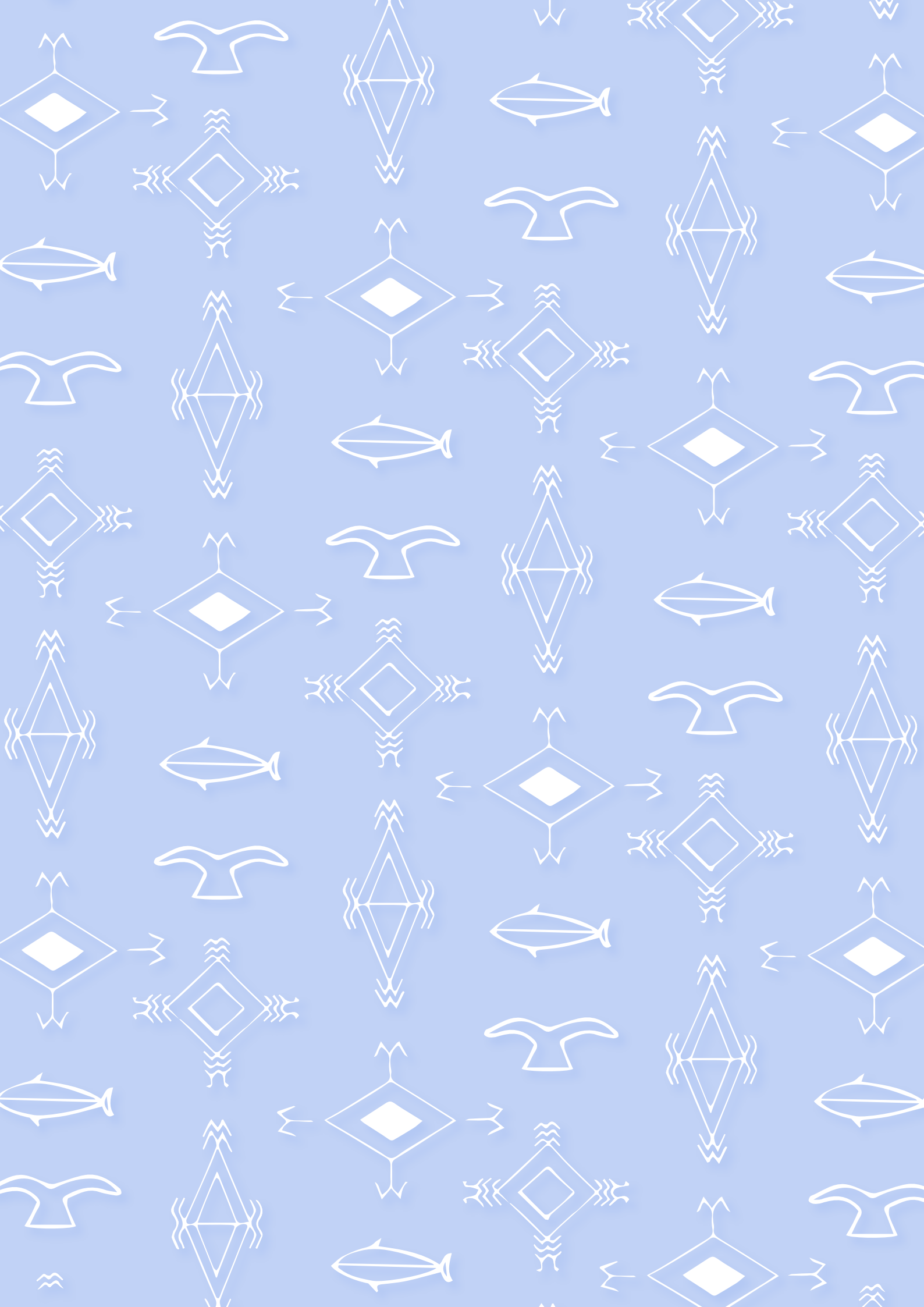


By 2020, knowledge, the science base and technologies relating to biodiversity, its values, functioning, status and trends, and the consequences of its loss, are improved, widely shared and transferred, and applied.



By 2020, at the latest, the mobilisation of financial resources for effectively implementing the Strategic Plan for Biodiversity 2011-2020 from all sources, and in accordance with the consolidated and agreed process in the Strategy for Resource Mobilisation, should increase substantially from the current levels. This target will be subject to changes contingent to resource needs assessments to be developed and reported by Parties.







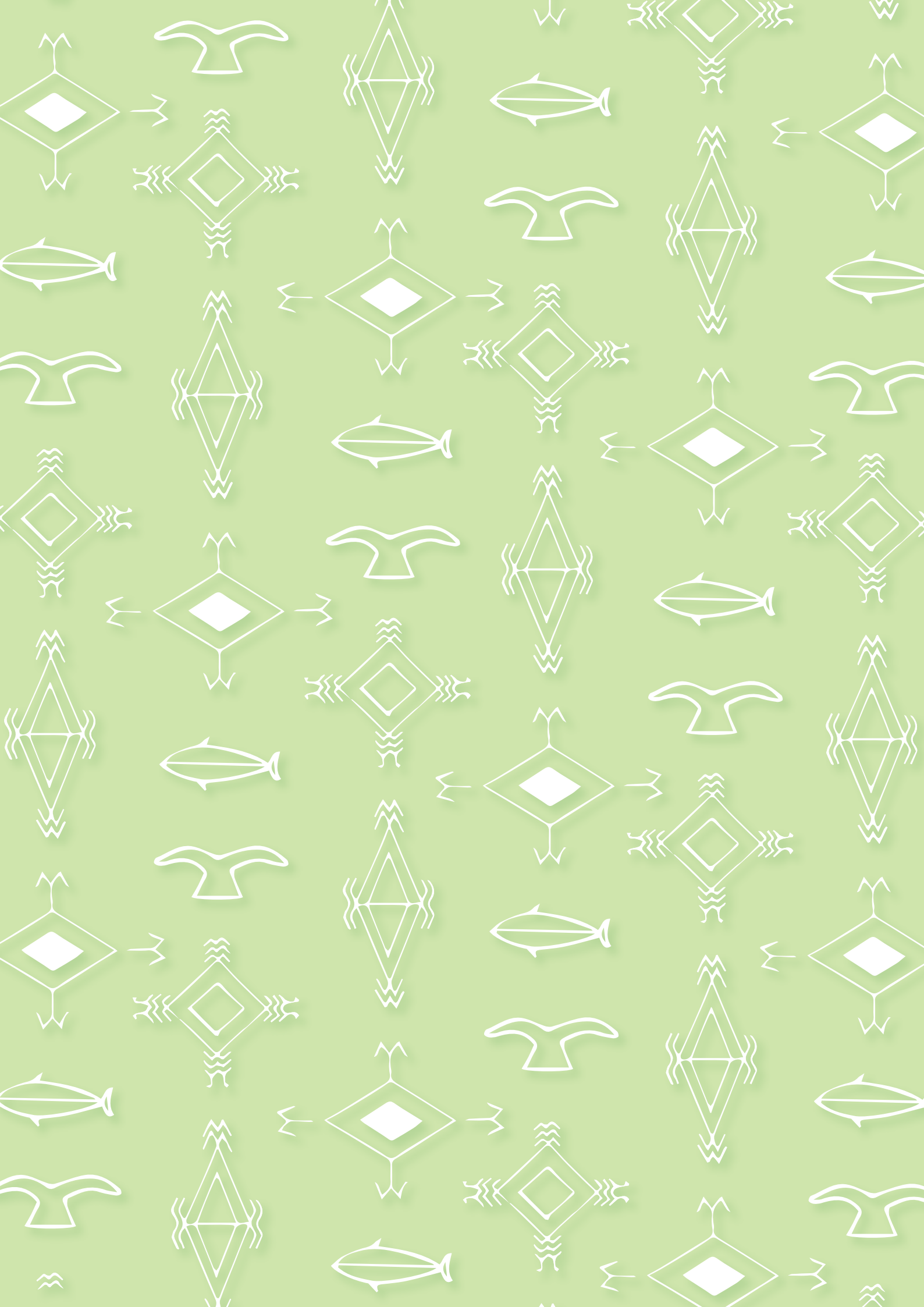


# DRIVERS AND PRESSURES ON THE SOLOMON ISLANDS ENVIRONMENT



Photo © Stuart Crane



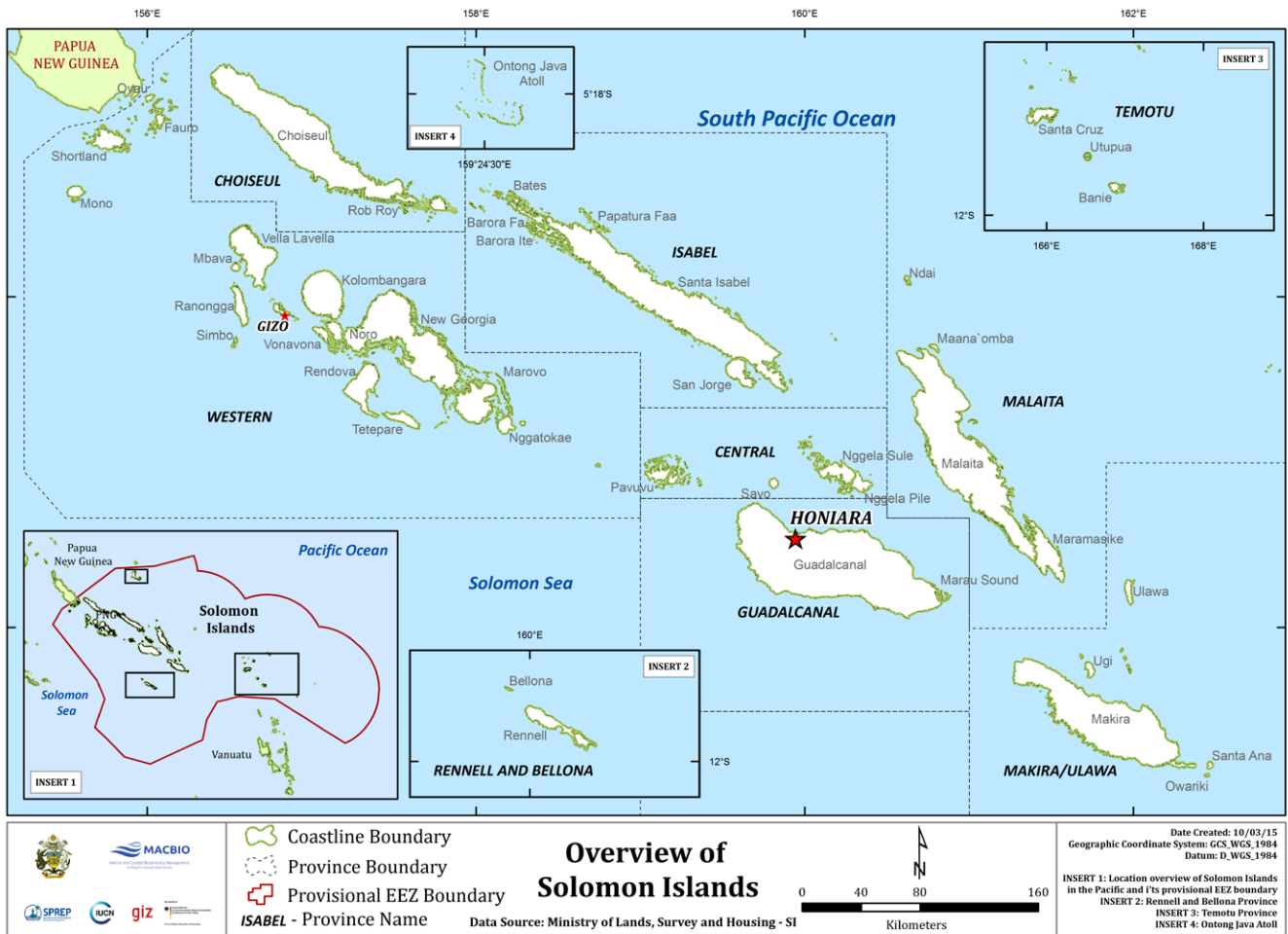


# DRIVERS AND PRESSURES ON THE SOLOMON ISLANDS ENVIRONMENT



## DRIVERS FOR ENVIRONMENTAL CHANGE IN SOLOMON ISLANDS

Previous SoE reports have shown that Solomon Islands' environment and heritage is under increasing threat from a number of sources, including economic development and global climate change. These factors need to be managed to ensure sustainability into the future. This section highlights several key drivers affecting the state of environment in Solomon Islands.

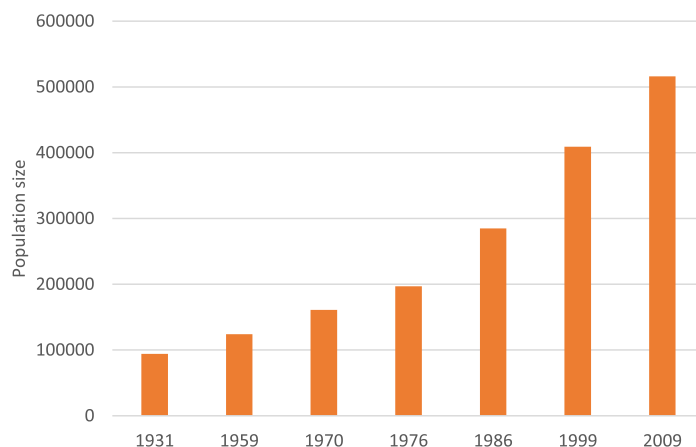


**FIGURE 5.** The Solomon Islands in the western Pacific.

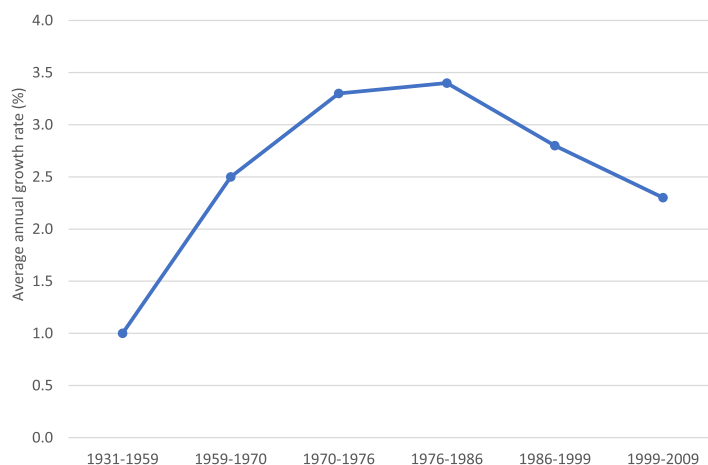


## Driver 1: Population trends

Population growth is a major driver of environmental change. The most recent Solomon Islands census (2009) showed a total population of 515,870 people and the population has grown rapidly over recent decades (Figure 6). The rate of growth peaked during 1976–1986 at 3.4% annually but has decreased to 2.3% in the most recent period (Figure 7).



**FIGURE 6.** Human population in the Solomon Islands, 1931–2009 (Solomon Islands Government 2009).



**FIGURE 7.** Average annual population growth rate (%), Solomon Islands 1931–2009 (Solomon Islands Government 2009).

**TABLE 4.** Selected summary statistics from the 2009 census (Solomon Islands Government 2009).

<b>Total population</b>	<b>515,870</b>
Average population growth rate (%)	2.3
Population density (number of people /km <sup>2</sup> )	17
Urban population	102,030
Per cent urban (%)	19.8
Urban growth rate (%)	4.7
<b>Population structure</b>	
Number of children (<15 yrs) number (%)	209,284 (40.6%)
Youth population (15–24 yrs) number (%)	96631 (19.7%)
Median age (years)	19.8

The Solomon Islands population is predominantly young, with about 60% of the population under 25 years and a median age of 19.8 years (Table 4). The population growth rate is higher in urban areas than in the overall population (Table 4). Less than 1% of the Solomon Islands population was born overseas.

These population changes drive increased demand for employment, food, water, and a range of attendant services. The increasing urban population, especially in Honiara, places increasing stress on urban infrastructure relating, for example, to water, transport and sanitation.

## Driver 2. Economic Development

The Solomon Islands National Development Strategy (NDS) 2016–2035 sets out national aspirations towards the Vision: *Improving the Social and Economic Livelihoods of all Solomon Islanders*. The national mission is:

*To create a peaceful, harmonious and progressive Solomon Islands led by ethical, accountable, respected and credible leadership that enhances and protects peoples culture, social, economic and spiritual well-being.*

Economic development is expected to underpin these NDS goals, including poverty alleviation and raising the standard of living. Table 5 shows that in 2014, approximately 43% of GDP was derived from a) agriculture, forestry and fisheries, and b) industry (including mining, water etc). Although the contribution of these sectors has decreased slightly since 2007 (43%), this shows the continuing importance of natural resources/ecosystem services in economic development. There is also potential future development in these sectors, for example, in offshore mining.

**TABLE 5.** Gross domestic product by economic activity in Solomon Islands.

Economic Activity	Current Prices (SI\$ Millions)							
	2007	2008	2009	2010	2011	2012	2013	2014
<b>AGRICULTURE, FISHERIES AND FORESTRY</b>	<b>1,226.1</b>	<b>1,461.8</b>	<b>1,517.9</b>	<b>1,707.1</b>	<b>1,858.8</b>	<b>1,957.0</b>	<b>2,074.8</b>	<b>2,150.0</b>
Agriculture & Hunting	700.0	864.1	908.0	1,014.4	1,143.3	1,110.2	1,187.9	1,218.7
Forestry & Logging	347.7	399.6	413.0	537.0	524.8	598.5	674.1	739.1
Fishing	178.4	198.1	196.9	155.7	190.6	248.3	212.8	192.2
<b>INDUSTRY</b>	<b>454.4</b>	<b>506.1</b>	<b>616.6</b>	<b>747.7</b>	<b>1,056.9</b>	<b>1,034.2</b>	<b>1,112.3</b>	<b>1,152.3</b>
Mining & Quarrying	5.3	8.6	23.3	37.3	268.0	180.3	192.6	59.7
Manufacturing	310.1	343.6	398.0	465.4	527.3	530.3	534.6	609.6
Electricity & Water	36.1	35.7	61.5	113.5	127.8	160.0	195.8	245.4
Construction	102.9	118.1	133.9	131.5	133.7	163.6	189.3	237.7
<b>SERVICES</b>	<b>2,367.0</b>	<b>2,655.1</b>	<b>2,896.7</b>	<b>3,160.6</b>	<b>3,354.4</b>	<b>3,692.9</b>	<b>4,174.8</b>	<b>4,380.9</b>
Wholesale and Retail Trade	497.3	584.7	641.7	731.3	821.7	920.3	1,014.0	1,127.1
Hotel & Restaurants	28.6	33.5	97.3	137.7	176.6	183.3	207.3	173.4
Transport & Storage	225.4	257.5	287.3	307.8	323.1	338.3	367.0	400.7
Communications	120.2	130.3	134.1	128.3	84.3	75.1	77.5	79.3
Financial Intermediation	146.0	199.1	171.0	132.3	157.6	192.1	215.7	239.4
Insurance Services	46.9	52.0	57.1	73.8	87.9	107.2	120.3	133.5
Real Estate & Renting	262.6	276.1	286.2	296.7	307.6	318.9	394.6	409.1
Owner Occupied Dwellings	133.9	141.2	146.8	152.6	158.7	197.0	244.5	243.0
Business Services	28.7	34.5	38.3	41.9	49.3	54.2	60.1	63.2
Public Administration & Defense	431.2	446.4	510.4	570.1	563.1	618.0	708.1	728.0
Education	187.1	217.8	236.9	269.1	286.5	316.8	366.1	367.0
Health	76.6	89.3	101.0	113.5	121.9	137.5	164.0	166.4
Other Services	182.6	192.7	188.6	205.5	216.2	234.3	235.6	250.9
Taxes on Products less Subsidies	108.7	121.8	127.9	129.0	186.9	222.2	226.9	220.5
Less Imputed Bank Charges	(85.5)	(136.3)	(147.5)	(149.2)	(160.4)	(195.5)	(219.5)	(243.6)
<b>GROSS DOMESTIC PRODUCT (GDP)</b>	<b>4,070.7</b>	<b>4,608.5</b>	<b>5,011.7</b>	<b>5,595.2</b>	<b>6,296.6</b>	<b>6,710.8</b>	<b>7,369.2</b>	<b>7,660.1</b>
<i>GDP Excluding Development Budget</i>	<i>3,836.6</i>	<i>4,398.5</i>	<i>4,778.7</i>	<i>5,341.1</i>	<i>6,075.6</i>	<i>6,482.7</i>	<i>7,124.0</i>	<i>7,390.4</i>



### Driver 3. Climate Change

Climate change refers to a change in climate attributed to human activity that alters the global atmosphere and is in addition to natural climate variability observed over comparable time periods. Pacific Island Leaders have repeatedly highlighted the vulnerability of Pacific island countries to climate change. At their 2018 Forum meeting, Pacific Leaders stated “that climate change presents the single greatest threat to the livelihood, security and wellbeing of Pacific people”.

A recent report (Howes et al. 2018) summarises the potential effects for Pacific island countries:

*Small Island Developing States in the South Pacific are particularly vulnerable to the effects of marine climate change due to their proximity to the ocean and their reliance on it for resources and transportation. Changes to the physical environment (e.g. temperature, pH, sea level rise and storms and waves) are already being detected and are affecting biodiversity via shifts in distribution, the timing of natural events (phenology), increased energetic costs of physiological processes, mechanical damage and loss/fragmentation of habitats. Much of the Pacific islands’ population and infrastructure (including freshwater resources) are situated on the coast and thus, vulnerable to erosion, inundation and damage from cyclones. Food supplies are also at risk due to the heavy reliance on coastal fisheries. The dispersed nature and heterogeneity of the SIDS presents a challenge for localised climate projections and adaptation strategies.*

Long-term effects of changes in rainfall patterns, extreme events, sea level rise, and ocean acidification will continue to affect many aspects of life in Solomon Islands.

### Driver 4. Traditional and contemporary values and lifestyles

- Environmental change is also influenced by people’s attitudes and approaches towards issues such as environment, development, and the meaning of sustainability. Some examples are:
- **Land ownership and access:** Customary land tenure arrangements, and the way these interact with the roles of national and provincial government, can have profound effects on the character and acceptability of environmental change and the permitting (or otherwise) of development proposals.

- **Public attitudes to sustainability:** People may be unaware of the connection between their actions and the long-term consequences, an example is the connection between waste management (litter, burning) and public health. These connections need to be recognised and absorbed into public attitudes and behaviour.
- **Inclusiveness:** Ensuring that relevant people are involved in decision-making can help to promote widespread support for effective environmental management. This includes involvement of women and youth, alongside other stakeholders.
- **Corporate attitudes and responsibility:** Private sector businesses need to play their role through respecting customary practices, and national and provincial laws and regulations, as well as promoting best practice for working conditions and environmental sustainability.

### Key pressures

The high-level drivers of change underpin activities that place pressure on the environment and natural resources. These pressures apply across a range of sectors including:

**Use of natural resources:** forestry, fishing and mining place pressure on the sustainability of natural resources through depletion of finite resources (e.g. mining), over-extraction of renewable resources (e.g. forestry), lack of control over environmental effects, such as loss of biodiversity (logging).

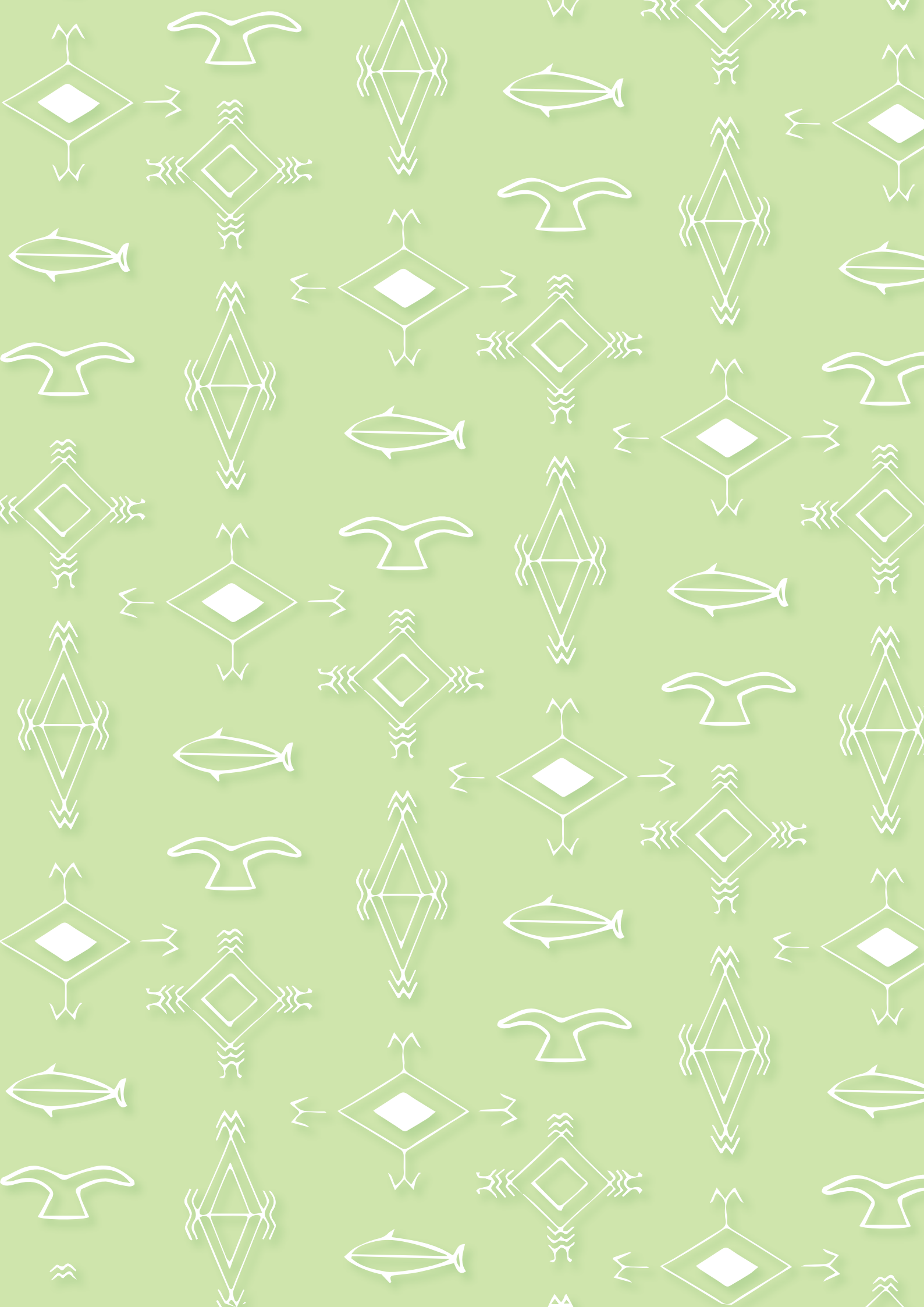
**Urban development:** Increasing urbanisation puts pressure on land use and land-use planning to manage environmental effects. Key utilities such as potable water and sanitation need to be well managed to avoid effects on water quality (freshwater and coastal) and human health.

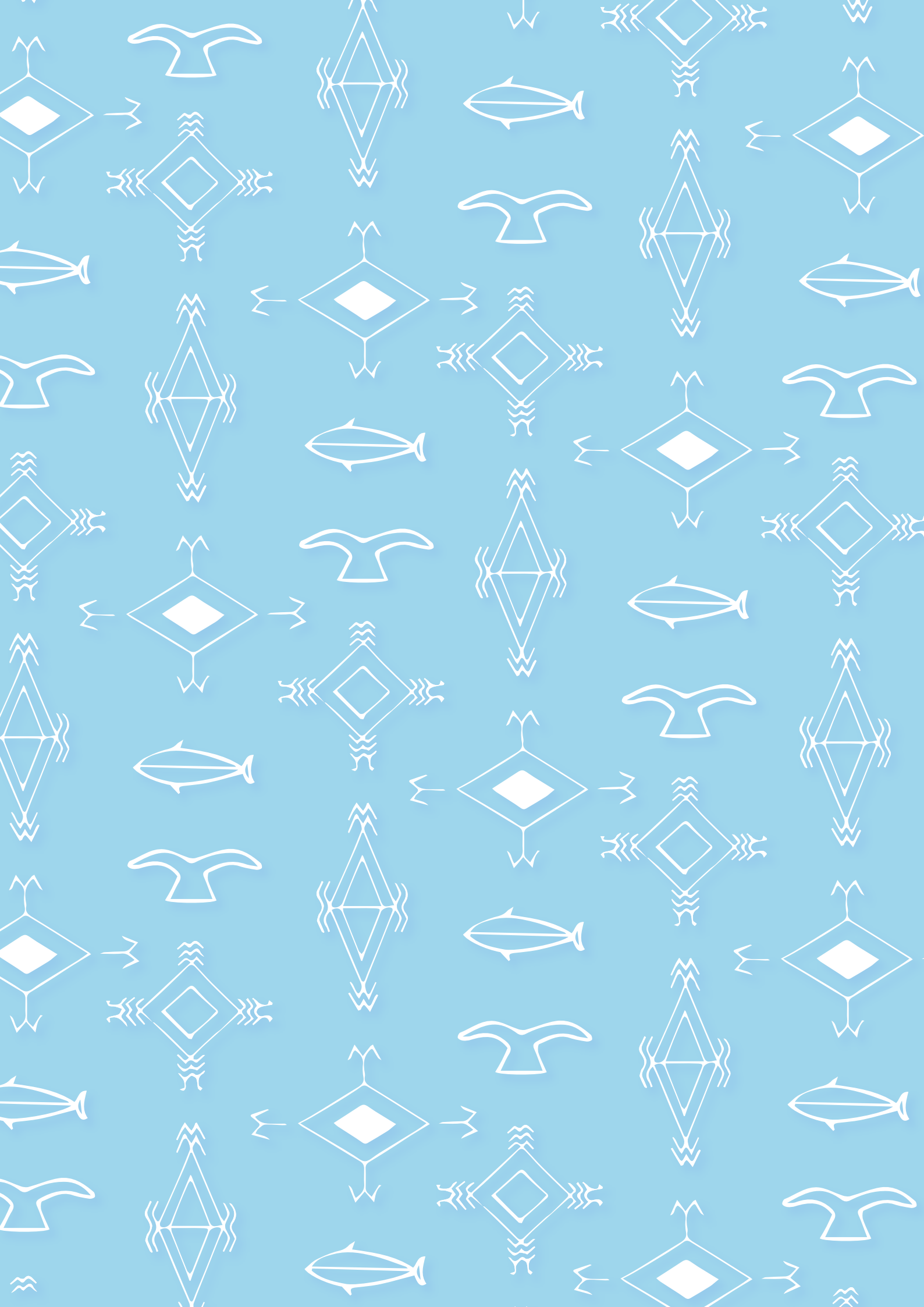
These linkages are discussed in detail under each of the thematic areas in section 3.

### References

- Howes, E. L., Birchenough, S., Lincoln, S., (2018). Effects of climate change relevant to the Pacific islands. *Science Review* 2018, 1–9.
- Solomon Islands Government, (2009). Population & Housing Census National Report (Volume 2). Ministry of Finance and Treasury, Honiara.
- Solomon Islands Government, (2016). National Development Strategy 2016–2035. Ministry of Development, Planning and Coordination, Honiara.



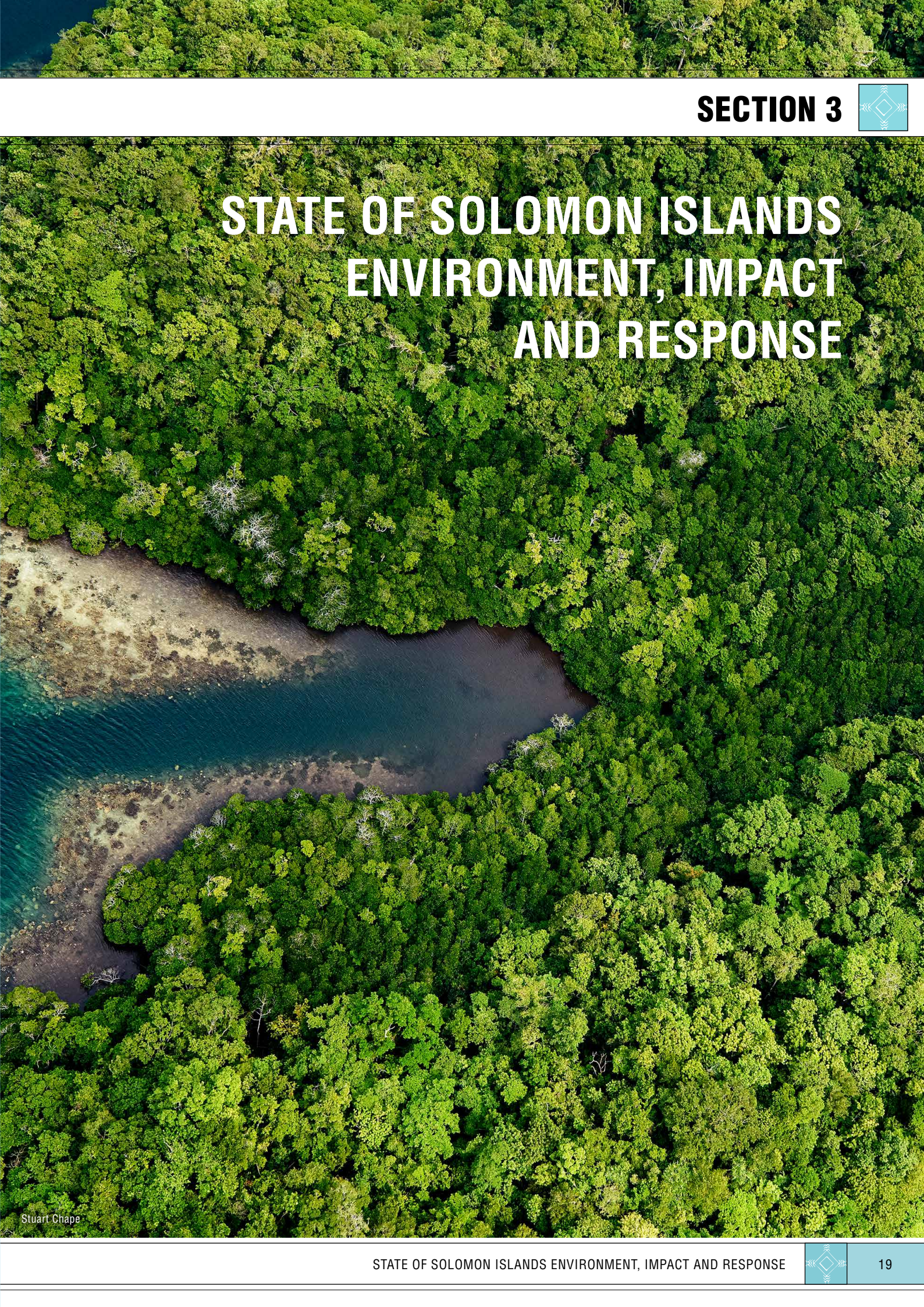








# STATE OF SOLOMON ISLANDS ENVIRONMENT, IMPACT AND RESPONSE



Stuart Chape



# THEME 1 CULTURE AND HERITAGE



Julie Callebaut/SPREP



## THEME 1 CULTURE AND HERITAGE

The first discoverers of the Solomon Islands were the island peoples themselves. They settled the main islands and developed land-based communities, first with agriculture and then through animal husbandry, particularly pigs. They also developed fishing and other marine skills, especially in the lagoons. Subsequent migrants, finding that the big islands were occupied, settled on the outlying islands, most of which are coral outliers. Sikaiana, Reef Islands and the Temotu Islands. These migrants were mostly Polynesians, and they mastered fishing and navigation.

Before Britain proclaimed protectorate status over the islands in 1893, there was no single centralised politico-cultural system. What existed were numerous autonomous clan-based communities often headed by a male leader with his assistants. Unlike Polynesian societies, there had not been a known overall monarch ruling the islands.

Within the islands there was intercommunity trading and even warring networks. These networks were further cemented by intermarriages and mutual help alliances.

With the arrival of churches and government, communication was made easier between the islanders, and further networks then developed. The British also put an end to intertribal warfare and conflicts. As a result, the predominant cultures of Melanesia and Polynesia were deeply intertwined with the cultures of the different churches, and both urban and rural lifestyles. Added to this was the introduction of western popular culture.

The convergence of a number of factors developed national culture in Solomon Islands. One of the most important is the high level of tolerance and comity developed between different churches in the last century. Unlike the government, church missions have done a lot for the people. They have provided schools, clinics, church buildings, and overall good will. The churches have enabled different cultures to assimilate such teachings as the social gospel of sharing and caring.

Another factor that congeals national culture is the sharing of a lingua franca, the 'Solomon Islands Pidgin English'. Although pidgin English is not a compulsory subject in schools, it is the social glue that cements the relationships particularly in a country with multiple languages.

Concomitant with the above is the concept of wantokism. Wantokism is a rallying philosophy that brings together, in common cause, people who are related, those who speak similar languages, those from the same area or island and even the country as a whole. Its social malleability means that it can be applied in more than one situation especially when one is new to a place or unfamiliar to a group of people. It is a concept in which mutual hospitality is shared among and between different individuals and groups.

The development of a national culture was also influenced by the battles Solomon Islanders experienced during World War II. Although the "war was not our war", the fact

that many Solomon Islanders had common experiences, including putting their lives at risk to save their country from the enemy (the Japanese), helped unite them into one people.

The ethnic groups of Solomon Islands reflect the natural division of the islands. A Guadalcanal person would readily identify with others from Guadalcanal. This would equally apply to a Malaita person who would easily relate to another Malaita person. But within the islands, ethnic associations follow different languages. Having more than seventy languages in the Solomon Islands means, then, that there are more than seventy ethnic groups as well.

There are many cultural differences in traditions and *kastom* in the Solomons, particularly depending on kinship and clan ties. *Kastom* is a Pijin term derived from 'custom'. Throughout the Solomon Islands, *kastom* represents the idea of culture or traditional ways of doing things and together with the Wantok system, is central to village life and the way the society is organised.

Cultural expression and practices are extremely important for Solomon Islands and this theme highlights some key areas as they relate to the environment – cultural practice (including the role of House of Chiefs) and traditional knowledge, traditional diet, and indigenous language. The issue of customary land tenure is discussed in the 'Land' thematic area.

In early 2018 it was reported that the Vonsa House of Chiefs held its first-ever forum at Vonunu Village in South Vella la Vella Island. Its purpose was to revive, discuss and re-enforce Vella la Vella cultural custom. The Western Province Premier Mr Wayne Maepioh, in his keynote address, was reported as saying:

"culture is the lifeblood of a vibrant society, expressed in many of the ways we tell our stories, celebrate, remember the past, entertain ourselves and imagine the future.

Our creative expressions help us define who we are and help us see the world through the eyes of others.

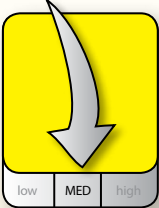
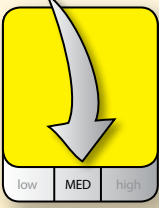
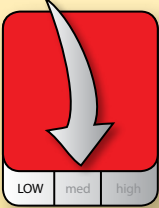
Culture provides important social and economic benefits and improves learning and health, increases tolerance and opportunities to come together with others, and culture enhances our quality of life and increases overall well-being for both individuals and communities.

Participating in culture can benefit individuals in many ways, some of which are deeply personal, and they are a source of delight and wonder and can provide emotionally, intellectually moving, experiences, whether pleasurable or unsettling that encourage celebration or contemplation of culture as a means of expression".

The theme culture and heritage identified three indicators that will be used to observe the status and trends. They are (1) culture and traditional knowledge, (2) indigenous language and (3) traditional diets.

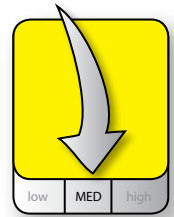


CULTURE AND HERITAGE HIGHLIGHTS

INDICATOR	STATUS AND TREND	KEY FINDINGS	RESPONSE AND RECOMMENDATIONS
<p>CULTURE AND TRADITIONAL KNOWLEDGE</p>	 <p><b>Status</b> Fair</p> <p><b>Trend</b> Deteriorating</p> <p><b>Data confidence</b> Medium</p>	<p>House/Council of Chiefs are deteriorating though there are some efforts to revive the structures and their functions.</p> <p>Many traditional <i>tabu</i> sites have been destroyed by logging and mining.</p> <p>Tourism is a small but growing sector of the economy.</p>	<p>Pass the Traditional Knowledge Expression of Culture Bill and Traditional Governance Bill aimed at protecting heritage/cultural sites.</p> <p>Establish central database for data sharing.</p> <p>Incorporate cultural concepts and practices and language into National Curriculum Syllabus.</p>
<p>INDIGENOUS LANGUAGE</p>	 <p><b>Status</b> Fair</p> <p><b>Trend</b> Deteriorating</p> <p><b>Data confidence</b> Medium</p>	<p>Of 76 individual languages of the Solomon Islands, 73 are living and three are extinct.</p> <p>Three languages are institutional, 26 are developing, 28 are vigorous, eight are in trouble, and eight are dying.</p>	<p>Incorporate cultural concepts and practices and language into National Curriculum Syllabus.</p>
<p>TRADITIONAL DIET</p>	 <p><b>Status</b> Poor</p> <p><b>Trend</b> Deteriorating</p> <p><b>Data confidence</b> Low</p>	<p>Traditional diets comprised local root crops, leafy vegetables and fruit, as well as animal protein and seafood.</p> <p>There has been a recent shift towards cereals, such as rice and cheaper imported and processed foods like two-minute noodles. This has health implications and the number of non-communicable disease cases has been rising.</p>	<p>Increase space for vegetable markets.</p> <p>Ensure affordable wholesome food for the local population.</p> <p>Regulate imported and locally manufactured processed food.</p>

CULTURE AND TRADITIONAL KNOWLEDGE

This indicator is a composite assessment of a range of culture and traditional knowledge fields, including House of Chiefs, Heritage and *tabu* sites, and Knowledge, artefacts and crafts.



low MED high

**Status**  
Fair

**Trend**  
Deteriorating

**Data confidence**  
Medium



**FIGURE 1.1.** Wood carver in the Solomon Islands. © Stuart Chape.



**FIGURE 1.3.** Traditional hand-crafted baskets woven by a woman from Guadalcanal Province, Copyright by ECD, MECDM



**FIGURE 1.2.** Local hand-crafted jewellery made from stones and shells. © ECD, MECDM.





forecasts we may produce valuable forecast products for improved decision-making, risk management and disaster prevention in the communities.

Significant initiatives are being implemented in some areas, notably in the support of culture festivals, such as the Yam festival South Malaita, weaving festival in Guadalcanal, Kodili festival in Isabel, Wagosia (spear) festival Makira, Pana festival, Gela, Banana Festival, Gela, Tomoko festival, Western province, ngali nut festival day.

Key recommendations include:

- Set up a central database for data sharing and exchange, linked to the Solomon Islands Data Portal (Inform project) and the Pacific Environment Portal.
- Incorporate cultural concepts and practices and language into National Curriculum Syllabus from primary level (e.g. Oral stories, arts and craft class, etc.).
- Organise a National Cultural day in Solomon Islands to bring people from all over the country to celebrate.

## References

All data sourced from Ministry of Culture and Tourism 2018.

Countries and their Culture: Solomon Islands. Retrieved from <https://www.everyculture.com>



Julie Callebaut/SPREP



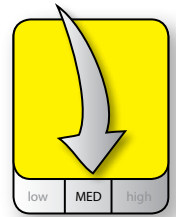
Photos: Julie Callebaut/SPREP

INDIGENOUS LANGUAGE

This indicator assesses the status of indigenous languages in Solomon Islands.



FIGURE 1.5. Solomon Islands have a high diversity of traditional languages though several are dying or extinct. © Stuart Chape



low MED high

Status Fair

Trend Deteriorating

Data confidence Medium

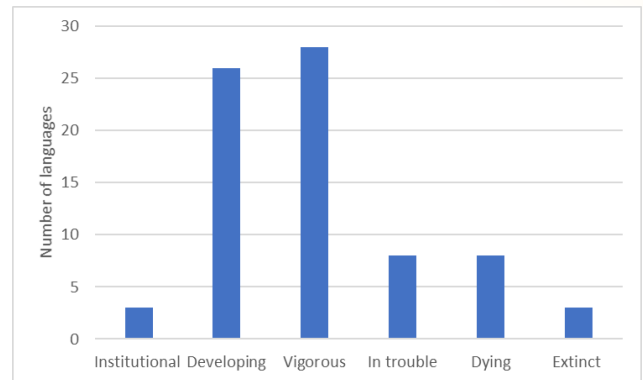


FIGURE 1.6. Profile language status for the Solomon Islands in 2018 (Simons and Fennig 2018).

▼ Photos: Julie Callebaut/SPREP





## Status and trend discussion

There are 76 individual languages listed for Solomon Islands and Pijin is used by most people as a common language. Wantok literally means 'one talk', describing the way villagers feel a duty to those who speak the same language and why kinship and clan ties are strong in Solomon Islands. Under wantok, individual members of a family or clan will always be well supported by their fellow clans people (Figure 9). Of the 76 individual languages, 73 are living and three are extinct. Of the living languages, 71 are indigenous and two are non-indigenous. Further, three are institutional, 26 are developing, 28 are vigorous, eight are in trouble, and eight are dying (Table 6; Figure 8; Simons and Fennig 2018).

## Impact

Loss of language erodes the traditional basis of Solomon Islands culture, contributing to a loss of social cohesion and community well-being, with specific implications for etho-linguistic groups and the wantok system.

## Response and recommendations

Incorporate cultural concepts and practices and language into National Curriculum Syllabus from primary level (e.g. oral stories, language etc.).

Develop project proposal to develop and document languages that are dying or becoming extinct.

## References

Simons, G.F. and Fennig, D. (eds.). (2018). *Ethnologue: Languages of the World, Twenty-first edition*. Dallas, Texas: SIL International. Online version: <http://www.ethnologue.com>, accessed 9/01/2019.

**TABLE 1.1.** Status of languages of Solomon Islands.

	Location/Island/village	Language	Language Status
Malaita	Central Malaita Island, 2 areas; western tip, Guadalcanal island. Some in Honiara	'Are'are	Developing
	North Malaita Island	Baeggu	Vigorous
	North Malaita Island	Baelelea	Vigorous
	West Central Malaita Island	Dori'o	Vigorous
	Malaita Island	Fataleka	Vigorous
	Kwai, east Kwara'ae and Ngongosila Islands	Gula'alaa	Vigorous
	Central Malaita	Kwaio	Developing
	Central Malaita	Kwara'ae	Developing
	Northeast Malaita	Lau	Developing
	Luangiua atoll, Lord Howe Island; 210km from Santa Isabel Island	Ontong Java	Developing
	Near southern tip of Malaita island	Oroha	Shifting
	Sikaiana Atoll	Sikaiana	Status: Alternate: Sikayana
	North Malaita Island	To'abaita	Vigorous
	West Central Malaita Island	Wala	Developing
Temotu	Santa Cruz Islands	Aiwoo	Vigorous
	Utupua Island, Aveta, Matembo, and Nembao village	Amba	Vigorous
	Anuta Island	Anuta	Nearly Extinct
	Utupua Island, Asumbuo village	Asumboa	Nearly Extinct
	Santa Cruz Island. 3 villages	Engdewu	Shifting
	Vanikolo Island, Lale and Lavaka villages	Lovono	Nearly Extinct
	South Santa Cruz Island, Bibo, Nea, and Nooli villages	Nalogo	Developing
	West Santa Cruz Island, Graciosa Bay, some on north coast	Natugu	Developing
	Southwest Santa Cruz Island, Noipa village	Noipa	Vigorous
	Vanikolo Island, Emua village	Tanema	Nearly Extinct
	Utupua Island, Tanibili village	Tanibili	Nearly Extinct
	Vanikolo Island, Emua, Lale, Lavaka and Puma villages	Teanu	Shifting
	Widespread on Duff and Reef Islands, including on Matema, Nifiloli, Nukapu, Nupani, Pileni and Taumako	Vaeakau-Taumako	Vigorous

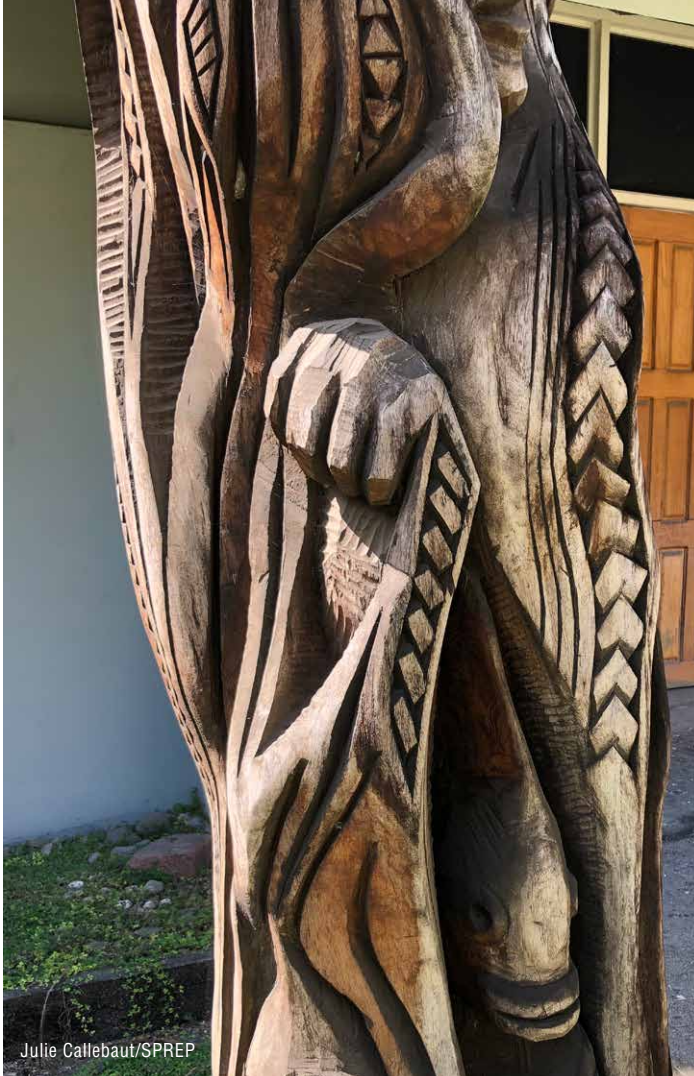


	Location/Island/village	Language	Language Status
<b>Makira</b>	Northwest Makira Island	Arosi	Developing
	Northwest Makira Island	Fagani	Threatened
	South Makira Island	Kahua	Developing
	San Cristobal, Santa Ana, Wanoni	Owa	Developing
	Ulawa and Three Sister Islands; Malaita Province, Southern Malaita Island	Sa'a	Developing
	Central Makira (San Cristobal)	Tairaha	Developing
	Makira Island, Temotu province: Tikopia Island, settlements on Nendo and Vanikoro islands	Tikopia	Developing
<b>Choiseul</b>	East Choiseul Island	Babatana	Developing
		Kiribati	1 (National) De facto national language
	Treasury Island, Mono; Shortland islands, Alo and Alu, Fauro Island	Mono	Vigorous
	Central Choiseul, North third of northeast coast.	Ririo	Nearly Extinct
	Choiseul Island, Tavula	Vaghua	Vigorous
	Northeast Choiseul Island	Varisi	Developing
<b>Western</b>	Vella la vella Island	Bilua	Developing
	Western province	Dororo	Unattested
	Kolombangara Island	Duke	Vigorous
	North Ranonga Island	Ghanonga	Vigorous
		Guliguli	Unattested
	New Georgia Island, North Marovo lagoon	Haova	Threatened
		Kazukuru	Extinct
	North New Georgia Island	Kusaghe	Vigorous
	South Ranonga Island	Lungga	Developing
	South New Georgia Island, Marovo lagoon, Nggatokae and Vangunu islands	Marovo	Developing
	North Central New Georgia, Roviana and Vona Vona Lagoons	Roviana	wider communication
	Simbo Island	Simbo	Vigorous
	South Rendova Island	Touo	Vigorous
	North Rendova Island	Ughele	Vigorous
	North Vangunu Island, Bareke, Southwest Vangunu Island, Vangunu	Vangunu	Vigorous

	Location/Island/village	Language	Language Status
<b>Guadalcanal</b>	East Guadalcanal Island	Birao	Vigorous
	West, northwest and north central coast.	Ghari	Developing
	North and east central	Lengo	Vigorous
	East coast, Bambasu, Longgu, Nangali, and Totongo villages	Longgu	Vigorous
	Central Guadalcanal Island	Malango	Vigorous
	Honiara and Aruligo (deaf village in San Isidro); scattered	Solomon Islands Sign Language	Vigorous
	Southeast to Southwest Coast of Guadalcanal	Talise	Vigorous
	<b>Isabel</b>	Maringe District, Hovukoilo and Popoheo village, Ghoove to Biluro on Hograno coast	Blablanga
Southeast end from Suma to Horara; Furona island off Kia district northwest coast		Bughotu	Developing
Central Isabel on Maringe side, Gnulahaghe villages southeast to Kuma'ihai; Kia district, Hograno coast villages, Gao- Bughotu region, scattered villages		Cheke Holo	Developing
Central Isabel Island, Tausese southeast to Floakora point, primarily in Poro		Gao	Vigorous
Northeast coast, Ghoove and Sisiga village; Hurepelo southeast coast		Kokota	Threatened
Kia District, Baolo and Samasodu villages		Laghu	Extinct
<b>Central</b>	Santa Isabel Island, Samasodu southwest to Kia village, North East to Baolo village	Zabana	Developing
	Central Isabel Island, Hograno Coast, Kilokaka village	Zazao	Nearly extinct.
	Gela and Florida Islands, Guadalcanal (immigrants), Savo Island	Gela	Developing
	Russell Islands	Lavukaleve	Vigorous
	Savo Island	Savosavo	Vigorous
<b>Rennell-Bellona</b>	Rennell and Bellona Islands	Rennell-Bellona	Developing

**TRADITIONAL DIET**

This indicator assesses the role of traditional diet and its contribution to human health.



Julie Callebaut/SPREP

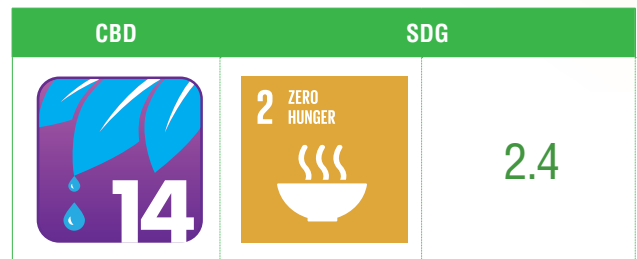


LOW med high

**Status**  
Poor

**Trend**  
Deteriorating

**Data confidence**  
Low



**Status and trend discussion**

Over 80% of Solomon Islanders live in rural areas where most of the food supply comes from subsistence gardens and from the sea. Traditionally, diets comprised local root crops like yam, pana and taro, leafy vegetables and fruit as well as animal protein and seafood (Figure 1.7). Subsistence gardens are still the most important source of staples and vegetables in the rural diet. The most produced staple foods are the starch-rich sweet potato, cassava, yam, banana, taro, breadfruit and corn. Vegetables produced are cucumber, tomato, shallot, snake bean, green bean and Chinese cabbage, as well as green leafy vegetables, such as pumpkin shoot, taro leaf and various bush greens.

The traditional diet does not distinguish between breakfast, lunch and dinner. What is eaten is usually what is available at that time. Solomon Islanders do not use many spices in their cooking except for coconut milk.

Today, the traditional diet has changed markedly, especially in urban areas. Rice is becoming the main staple and is often eaten with tea. For lunch and dinner, rice is eaten with canned meat or fish. The locally produced Solomon Taiyo (canned tuna) has become a favourite protein source.

For urban families with limited income breakfast consists of tea with leftovers from previous meals. More affluent families drink tea or coffee and eat buttered bread, rolls or biscuits. Lunch and dinner are usually the big meals of the day. Eating does not necessary follow time, but as they say,



**FIGURE 1.7.** Traditional Fishing method supports subsistence livelihood in rural area, Piruma, Makira Province (©Dickson Asha)



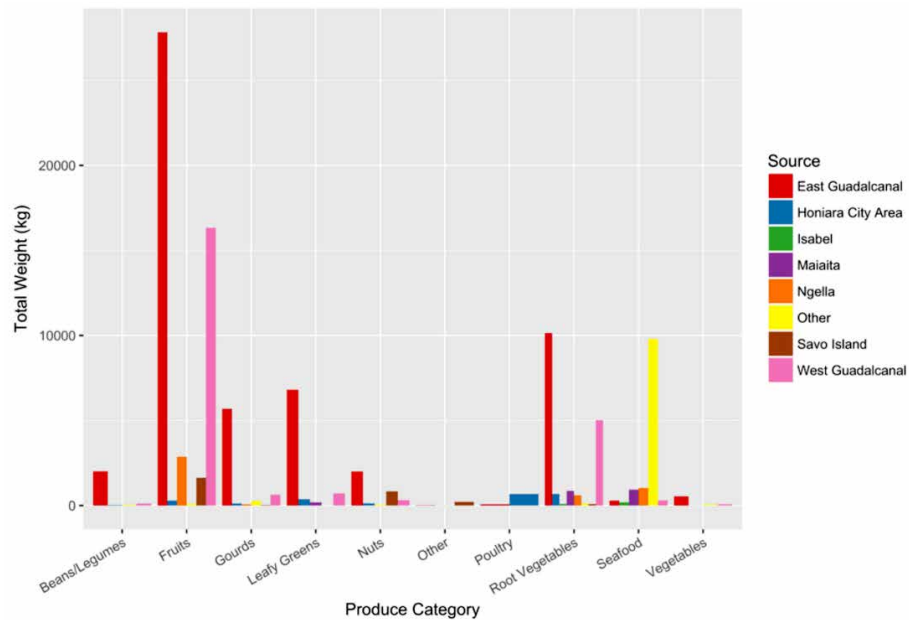
‘it follows the tummy’. Most families eat together so they can talk. Traditionally, the habit of eating at tables was not the norm. A 2017 survey of Honiara City Market (HCM) studied produce and sources of supply in detail (Georgeou et al. 2018).

The survey reported that produce at HCM includes categories that represent the main groups of dietary diversity: Beans/Legumes, Fruits, Gourds, Leafy Greens (such as island/slippy cabbage (bele), Nuts, Root Vegetables, Poultry and Seafood) (Figure 1.8). The quantities, freshness and diversity of available produce at HCM suggest that a nutritionally diverse diet is available to Honiara residents (Georgeou et al. 2018).

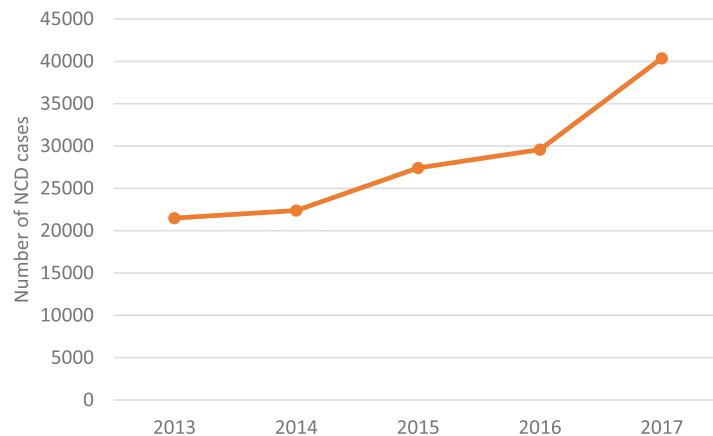
However, over recent decades cereals, such as rice and cheaper imported foods like two-minute noodles,

increasingly form part of Solomon Islander diets, with resulting health implications, including a rise in non-communicable diseases (NCD) (Figure 1.9). The 100 kg of rice consumption per capita in the Solomon Islands is the second highest among the Pacific Islands. NCDs are a problem throughout the Pacific – mainly heart disease, cancer, chronic lung diseases and diabetes – and are the leading cause of death in the Pacific region, accounting for up to 75 per cent of mortalities in most Pacific Island countries and territories.

Two thirds of the hospital beds at NRH are occupied by NCD patients and the burden that NCDs has on the productivity of people must not be underestimated. This includes family members who have taken time off studies and work to care for NCD patients.



**FIGURE 1.8** Total weight of produce by source at Honiara City Market (Georgeou et al. 2018).



**FIGURE 1.9.** Total number of reported non-communicable disease (NCD) cases in the Solomon Islands 2013–2017 (DHIS2, Ministry of Health and Medical Services, 2018 – Mr Bobby Paterson and Mr Jimmy J. Hilly).

## Impact

Poor diet and a sedentary lifestyle are major contributors to NCDs such as diabetes. Solomon Islands is currently experiencing an epidemiological transition, dealing with both communicable and NCDs, the latter contributes to the top 10 leading diseases in the country.

## Response and recommendations

The Solomon Islands government is addressing NCDs through a Multi-Sectoral National NCD Strategic Plan 2018–2022, along with community-based programmes. The NCD Plan has three main strategic components:

- Prevent NCDs and promote health and wellness for all
- Improve control of NCDs through capacity building and health systems strengthening
- Monitor and evaluate interventions to track progress to achieve set targets

In the agriculture sector there are initiatives to support small holder production of produce, including traditional root crops and leafy vegetables. Further initiatives include:

- Increasing space for vegetable markets
- Ensure affordable wholesome food for the local population
- Regulate processed food both manufactured locally and imported
- To work with Ministry of Commerce on measures to control imports of processed food i.e. rice, fizzy drinks
- Commerce to work with HCC/MAL to encourage selling of traditional food and improve food safety standards
- Strengthen links/ties between Commerce and HCC and Provincial governments to enforce compliance
- Data from Statistics Division (MOFT) and other relevant Ministries ie; MHMS be used in next reporting
- Propose further data collected of the same to come to a conclusion on the traditional diet in Solomon Islands

## References

Georgeou, N., Hawksley, C., Monks, J., Ride, A., Ki'l, M., and Barratt, L. 2018. Food Security in Solomon Islands: A Survey of Honiara Central Market, HADRI/Western Sydney University. Preliminary Report April 2018.

Available and retrieved from: <https://www.everyculture.com>



Julie Callebaut/SPREP





## THEME 2 ATMOSPHERE AND CLIMATE



## THEME 2 ATMOSPHERE AND CLIMATE

The Solomon Islands Government has recognised the importance of climate change to the country's future. The Government endorsed the Climate Change Policy (2012–2017), which is aligned to the National Development Strategy (2016–2035). The Solomon Islands is made up of many islands scattered over a vast ocean with a tropical climate, though temperatures are rarely extreme due to cooling winds blowing off surrounding winds. The Solomon Islands Government has recognised the impact of climate change to its environment and people and is committed to address them. The location of Solomon Islands is on the path of cyclones, which pose a serious threat to the people, economy, and environment and result in flooding and wind damages. A range of impacts have been identified and projected for the Solomon Islands affecting many sectors, including:

- Small islands will be very vulnerable to sea level rise and extreme events;
- Sea level rise will increase rates of inundation, storm surges, erosion and other coastal hazards and will threaten infrastructure, settlement, coastal food stock and facilities supporting livelihoods;
- Water resources are likely to be seriously affected;
- Coral reefs, fisheries and marine-based resources will be heavily impacted;
- Species is starting to be lost or replaced due to warming in higher altitudes;
- Subsistence and commercial agriculture will be adversely affected;

- Effects on tourism are likely to be direct and indirect and largely negative; and
- There is growing concern that human health will be impacted, mostly in adverse ways.

Predicted future climate for Solomon Islands as per IPCC:

- Temperature is projected to increase in the range of 0.4–1.0°C by 2030
- Average annual and seasonal rainfall projected to increase
- Extreme rainfall periods will occur more often and be more intense
- Less frequent but more intense cyclones including increase in average maximum speed and possible increase in rainfall intensity
- Sea level will continue to rise and impact of storm surges and coastal inundation
- Ocean acidification will continue to increase and affect health of reefs

For Solomon Islands, it is important to track key indicators of climate change effects and changes in atmospheric environment in order to design appropriate and timely responses. In addition to the environment impacts, changes in atmospheric conditions contribute to negative impact on health such as respiratory diseases.

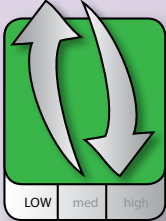
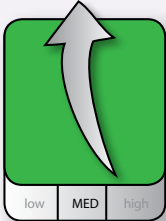

This section addresses both long-term climate-related trends, as well as direct measures of local air quality and emissions to the atmosphere.



Photo © Stuart Chape

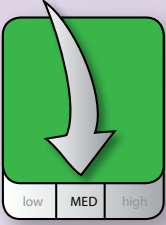



ATMOSPHERE AND CLIMATE HIGHLIGHTS

INDICATOR	STATUS AND TREND	KEY FINDINGS	RESPONSE AND RECOMMENDATIONS
<p>AIR QUALITY</p>	 <p><b>Status</b> Good</p> <p><b>Trend</b> Mixed</p> <p><b>Data confidence</b> Low</p>	<p>In 2009 8% of households disposed of waste through open burning and 95% of households cooked using 'wood/coconut shell' fuel.</p> <p>In 2012 mortality rate attributed to ambient air pollution was 54 in 100,000.</p> <p>Anecdotally, particulate matter from dust and vehicles has increased over the last five years.</p>	<p>Develop national air quality standards and monitoring systems (ensure proper equipment is in place).</p> <p>Implement emissions regulations for industries.</p> <p>Invest in renewable and energy efficient technology.</p> <p>Air, land and sea transport emissions regulation developed and enforced.</p> <p>Improve public sea and land transport.</p> <p>Legal framework to limit waste burning.</p> <p>Proper solid waste management practices – burning, collection and disposal.</p> <p>Promote alternatives to open biomass burning for cooking (example, kiko oven and kiko stove).</p> <p>Note: Material Safety Datasheets put in place to address gas inhalation caused by improper management of toxic gasses.</p>
<p>OZONE DEPLETING SUBSTANCES</p>	 <p><b>Status</b> Good</p> <p><b>Trend</b> Improving</p> <p><b>Data confidence</b> Medium</p>	<p>In 2002 the reported level of ODS consumption was 600 kg, below the base level for the Montreal Protocol.</p> <p>The significant reduction in ODS consumption between 2011–2013 was attributed to the phasing out of ODS under the Montreal Protocol.</p> <p>The refrigeration and air conditioning sector accounts for most of the volume of ODS consumption.</p>	<p>Strengthen close observance on entry of ODS and ODS-containing equipment into the country.</p> <p>Develop an accurate database of ODS consumers, ODS imports and consumption for continuous monitoring.</p> <p>Develop minimum standards and legislation on the type of air-conditioning and refrigerators imported into the country.</p>
<p>GREENHOUSE GAS EMISSIONS</p>	 <p><b>Status</b> Poor</p> <p><b>Trend</b> Deteriorating</p> <p><b>Data confidence</b> Medium</p>	<p>Solomon Islands has had an increase in GHG emissions from all sectors from 1994–2010 (refer to <b>TABLE 6</b>. Summary of Solomon Islands GHG emissions (CO<sub>2</sub> equivalent). SI reports on Energy, Waste, Land-use, and industrial processes to measure on GHG emissions.</p> <p>Logging contributes to the overall loss of carbon sequestration and if included in the country's total emissions, it makes Solomon Islands one of the largest GHG emitters per capita in the Pacific.</p> <p>In 2010, solid waste disposal on land (domestic) was 144,210 Tonnes.</p>	<p>Continue to monitor emissions across all sectors.</p> <p>Develop renewable energy and energy efficiency measures.</p> <p>Develop measures to control emissions from forestry.</p> <p>Land and Crop Management – through adjusting methods of managing land and growing crops.</p> <p>Improve Green House Gas Inventory for Solomon Islands.</p> <p>National Waste Management Strategy developed and implemented.</p>



ATMOSPHERE AND CLIMATE HIGHLIGHTS

INDICATOR	STATUS AND TREND	KEY FINDINGS	RESPONSE AND RECOMMENDATIONS
<p><b>RENEWABLE ENERGY SOURCES</b></p>	 <p><b>Status</b> Good</p> <p><b>Trend</b> Deteriorating</p> <p><b>Data confidence</b> Medium</p>	<p>In 2009 54.5% of Solomon Islands total primary energy supply was from renewable sources, mostly solid biofuels.</p> <p>A current World Bank-funded project titled 'Electricity Access and Renewable Energy Expansion Project' will deliver renewable energy mini-grids, electricity connections in low-income areas, and new grid-connected solar power.</p>	<p>Continue to monitor emissions across all sectors.</p> <p>Develop renewable energy and energy efficiency measures to reduce emissions.</p> <p>Set clear targets on renewable energy interventions in the new energy policy.</p> <p>Encourage Private Sector partnerships promoting renewable technology.</p> <p>Put in place standards and monitoring system on renewable energy appliances.</p> <p>Waste Management systems to be put in place for renewable energy appliances.</p> <p>Encourage use of renewable energy technology.</p> <p>Put in place a guideline on securing customary land for big energy projects. This guideline needs to cover awareness, negotiation, etc.</p> <p>Invest in renewable energy of all sizes to solve electricity accessibility to communities.</p> <p>Invest in capacity building on renewable energy maintenance and sustainability.</p>
<p><b>PHYSICAL CLIMATE</b></p>	 <p><b>Status</b> Good</p> <p><b>Trend</b> Deteriorating</p> <p><b>Data confidence</b> Medium</p>	<p>Temperature is the least varied of climate parameters with daytime fluctuating between 25 to 32 degrees Celsius.</p> <p>Solomon Islands is possibly experiencing sea level rise at a rate of 8–10 mm per year – high in global terms.</p> <p>Highest rainfall recorded of 3,000 to 5,500mm during the year. Daily rainfall of over 250mm is normal.</p> <p>Record rainfall for Honiara since mid-1950s: January 30th 2009 251.8mm within 24 hours and April 4th 2014 317.6mm within 24hrs.</p>	<p>Develop national and regional climate profile with a monitoring system put in place.</p>





Photos: Julie Canebaut/SPREP



**AIR QUALITY**

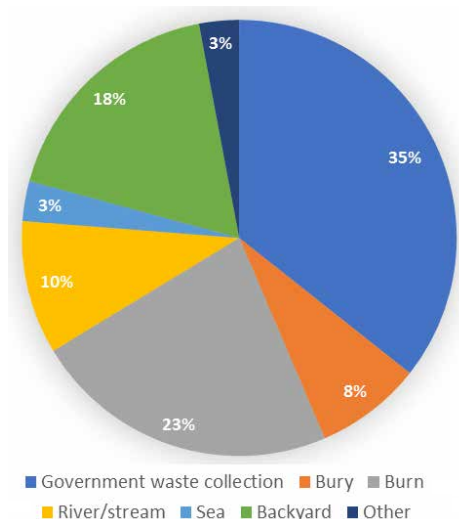
This indicator has three components: 1) open burning and cooking as a source of poor air quality, 2) case studies of particulate matter concentrations; and 3) information on respiratory diseases and mortality rate which are understood to be linked with air pollutants such as particulate matter in the air.



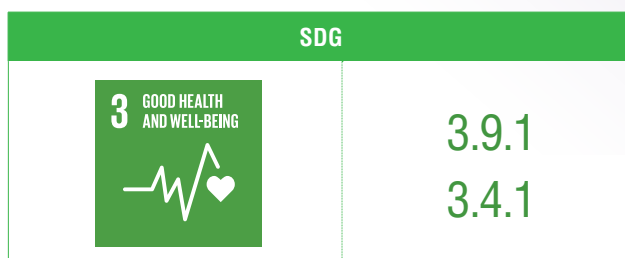
**Status**  
Good

**Trend**  
Mixed

**Data confidence**  
Low



**FIGURE 2.1.** Waste Disposal Modes (%) Honiara. Solomon Islands Government 2009.



**Status and trend discussion**

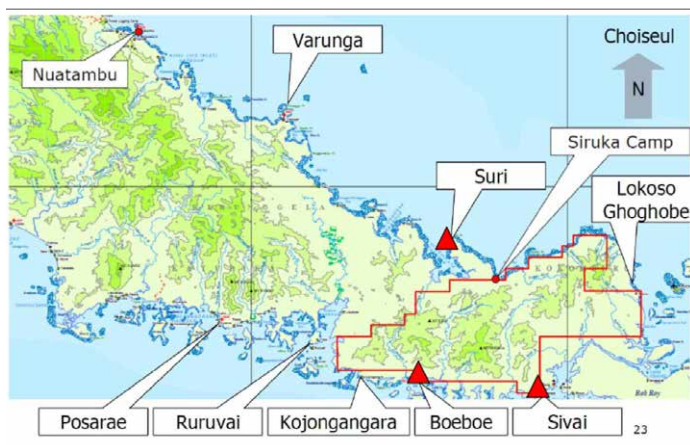
The 2009 census data shows that 8% of households dispose of waste through open burning, and in Honiara the rate is higher at 23% (Figure 2.1; Solomon Islands Government 2009). Air quality is also affected by use of biofuels in cooking, both domestically and in open roadside markets and stalls. The 2009 census recorded that overall 95% of Solomon Islands households cook using ‘wood/coconut shells’ as fuel (in Honiara the rate was 53%, with 37% using gas) (Solomon Islands Government 2009).

Honiara residents participating in workshops to develop this SoE reported high levels of particulate matter in the air in Honiara, over the past five years, largely from road dust and vehicle emissions (Figure 2.2). This resulted in reduced quality of life for Honiara residents. The 2009 census recorded a total of 2931 cars/buses in Solomon Islands of which 2450 (84%) were in Guadalcanal Province, the bulk being in Honiara. Similarly, of the total of 1898 trucks in Solomon Islands, 847 (44%) were in Guadalcanal Province.



**FIGURE 2.2.** Burning rubbish in the Honiara landfill. © Edward Danitofea, MECDM.



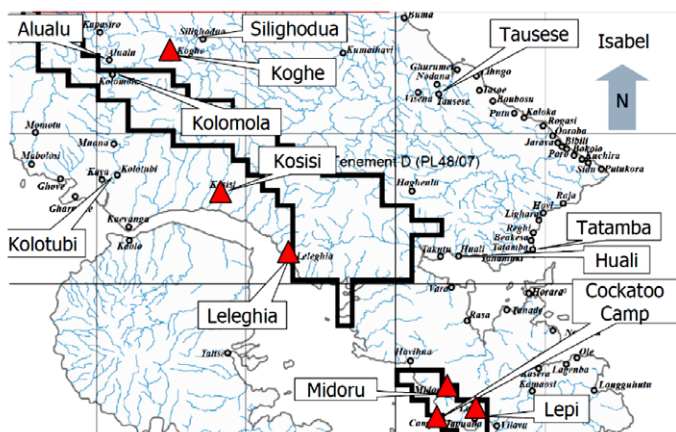


**FIGURE 2.3.** PM10 monitoring sites on Choiseul indicated by red triangles (SMM Solomons Ltd EIS, 2012).

Despite Honiara being reported by the workshop participants to have high levels of particulate matter, monitoring for inhalable particulate matter (PM10) conducted for a mining company EIS baseline studies on Choiseul and Isabel in 2011 and 2012 shows low concentrations for particulate matter (Figures 2.3, 2.4; Solomons Ltd, 2012). The monitoring for the PM10 was conducted by SMM Solomons Ltd as part of their EIA studies within their two tenements on Choiseul and Isabel (Figure 2.5). Figures 2.6 and 2.7 shows the results for the PM10 monitoring, November 2011 to January 2012. According to the SMM Solomon Ltd, EIS 2012, the baseline PM10 concentration are generally within the acceptable level of NEPM and WHO air quality standards which is 50 µg/m³. The two locations on Isabel and Choiseul are rural areas likely to be similar to other rural parts of Solomon Islands.

Persistent Organic Pollutants (POPs) also contribute significantly to the status of the country’s air quality. According to the Pacific GMP report 2012, the concentration of DDT is 105.3 ng/ PUF which was higher than any other Pacific islands country during the POPs monitoring (Figure 2.8); (Pacific GMP report 2012). The high concentration of DDT in the Solomon Islands most likely resulted from the intensive use of it in the Malaria eradication programmes in the past.

An FAO global report presented data on annual mean levels of fine particulate matter (PM2.5) in urban areas for 2014. For Solomon Islands, this figure was 5.0 (µg/ m³). This report was well received in the Solomon Islands media, with headlines announcing: ‘It’s official: Solomon Islands has the cleanest air in the world’. However, the same report ranked Solomon Islands amongst the lowest in the Pacific region for use of ‘clean fuels’, and a ‘mortality rate attributed to household and ambient air pollution’ in 2012 of 54.3 per 100 000 population.

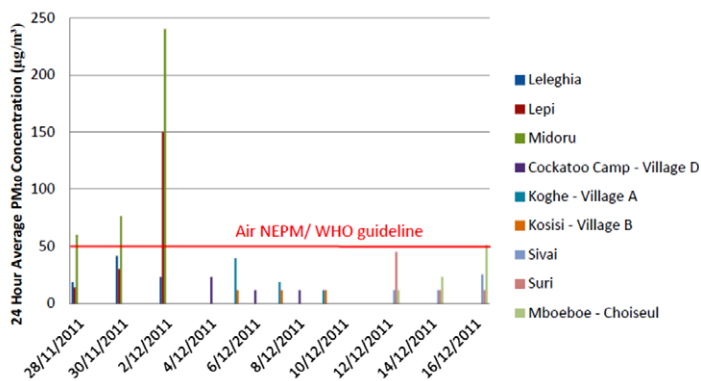


**FIGURE 2.4.** PM10 Monitoring sites on Santa Isabel indicated by red Triangle (SMM Solomons Ltd, EIS 2012).

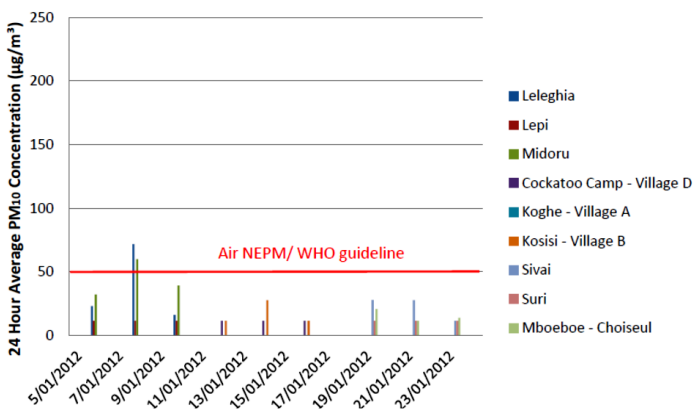


**FIGURE 2.5.** MicroVol Sampler use for PM10 monitoring at Leleghia, Santa Isabel (© SMM Solomons Ltd)

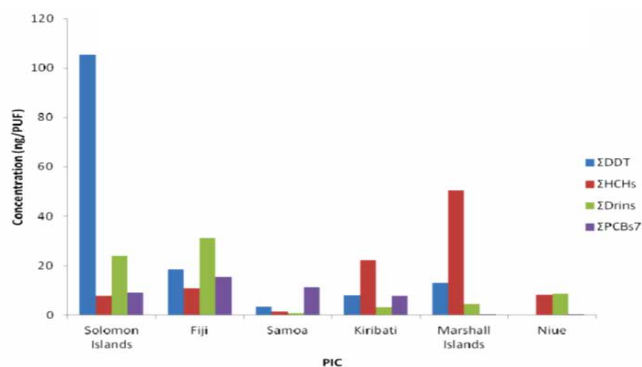




**FIGURE 2.6.** Inhalable particles (PM<sub>10</sub>) data sampling results for Choiseul and Isabel in November and December 2011 (SMM Solomons Ltd, EIS 2012).



**FIGURE 2.7.** Inhalable particles (PM<sub>10</sub>) data sampling results for Choiseul and Isabel in January 2012. (SMM Solomons Ltd, EIS 2012).



**FIGURE 2.8.** Basic POPs concentration across Pacific Island countries for Ambient air (Pacific GMP report).

## Impact

In large parts of the Solomon Islands outdoor air quality is good. However, there are risks in relation to:

- Increased concentration of pollutants from vehicle emissions (land and sea transport)
- dust from transport and other mechanised activities, and emissions from open burning of waste
- Indoor burning of biomass for cooking

These contribute to respiratory illness affecting the health and wellbeing of people.

## Response and recommendations

Against the background of the current pressures and the reported lack of regulatory controls, the following actions are recommended:

- Develop national air quality standards and monitoring systems and ensure proper equipment is in place with proper training programme.
- Implement emissions regulations for industries.
- Invest in renewable and energy efficient technology/ renewable energy.
- Air, land and sea transport vehicle emissions regulation developed and enforced.
- Expand and improve public sea and land transport.
- Legal framework to limit waste burning (proper solid waste management practices – burning, collection and disposal).
- Promotion of on-grid and off-grid electrification.
- Develop and promote alternatives to open biomass burning for cooking (example, kiko oven and kiko stove).
- Strengthen awareness on chemicals Material Safety Data to address risk of gas inhalation caused by improper management of toxic gasses and chemicals.

## References

Solomon Islands Government 2009. Population & Housing Census National Report (Volume 2). Ministry of Finance and Treasury, Honiara.

Solomon Islands 2nd National Communication 2017.

SMM Solomon Limited (2012). Environment Impact Statement for Choiseul tenement. A report produced for the Environment Impact Assessment prepared for the Government of Solomon Islands as required under the Environment Act 1998. Solomon Island Government, Honiara, Solomon Islands.

Pacific GMP report (2012). Supporting the Global Monitoring plan on persistent Organic Pollutant in Pacific Islands Region. UNEP, GEF.

Asia Pacific Air Pollution Report 2019.

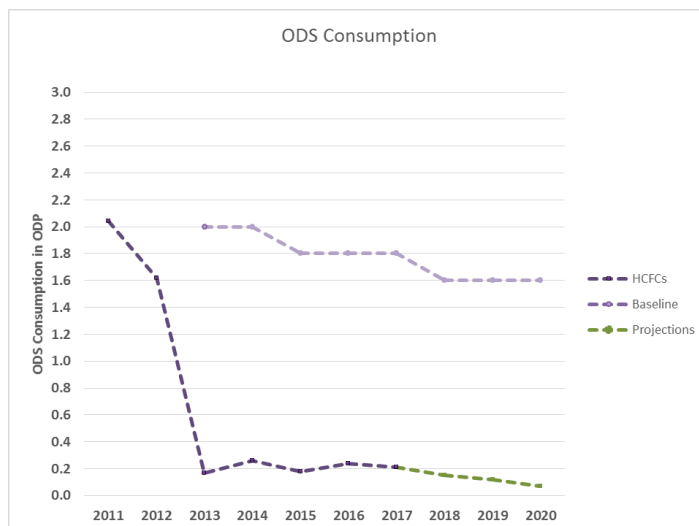


Julie Callebaut/SPREP

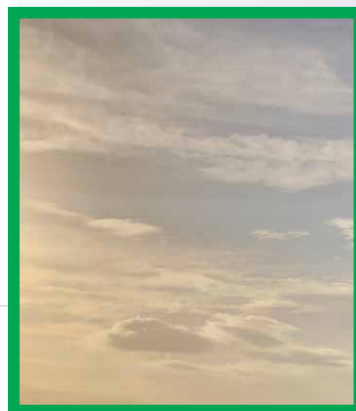


**OZONE DEPLETING SUBSTANCES**

Total ozone-depleting substances (ODS) consumed, including production of ODS products and ODS imports. Substances include CFCs and Methyl Bromide QPS (Quarantine and Pre-shipment).



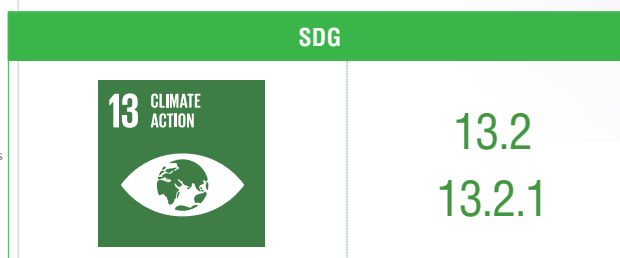
**FIGURE 2.9.** ODS Consumption reported to Montreal Protocol.



**Status**  
Good

**Trend**  
Improving

**Data confidence**  
Medium



**Status and trend discussion**

The base level for reductions under the Montreal Protocol is 2.4 ODP tonnes. Thus, Solomon Islands is a developing country and qualifies as operating under Article 5.1 of the Montreal Protocol. In 2002 the reported level of consumption was 600 kg, which is well below the base level for the Montreal Protocol.

Ratification of the Kigali Amendment to the Montreal Protocol: - Change from HFCs to other alternatives and Hydrocarbons.

The Kigali Amendment adds powerful greenhouse gases (HFCs) to the list of substances controlled under the Protocol and its implementation is expected to avoid up to 0.5 degree Celsius of global temperature rise by 2100, while continuing to protect the ozone layer. Energy Efficiency: A study is made to analyse the characteristics of major appliance and lighting products and markets in Solomon Islands. The study focuses on the following electrical appliances:

- Refrigerators
- Freezers
- Air Conditioners

- Lamps – Including incandescent, linear fluorescent and compact fluorescent
- Television
- Other relevant products

The Montreal Protocol work concentrates on Refrigeration and Air-conditioning (equipment and gas) refer to Table 2.1. Solomon Islands is prepared to ratify the Kigali Amendment.

According to the data submitted to the Ozone Secretariat (Figure 2.9), Solomon Islands has a declining consumption of hydrochlorofluorocarbons (HCFCs) in recent years. A significant reduction was observed between 2012–2013 which was attributable to the phasing out of ODS under the Montreal Protocol. Although consumption was still more than a 35% reduction from the baseline, the trend as observed is fluctuating which indicates that actions are still needed to phase out consumption. The refrigeration and air conditioning sector accounts for most of the volume of ODS consumption (Solomon Islands National Strategy and Action Plan under the Montreal Protocol; Figure 2.10; Table 2.1).



**TABLE 2.1.** Number of units of ozone-depleting items imported to Solomon Islands 2007–2011 (© National Ozone Unit, MMERE).

Electrical Appliance	2007	2008	2009	2010	2011
(Linear) Fluorescent Lighting	-	-	-	-	-
Air Conditioners (all sizes)	13,784	1,888	-	4,141	2,284
Domestic Dish Washers	16	24	-	14	30
Domestic Washing Machines	219	1,559	-	173	353
Electric Water Heaters	283	771	-	690	1,044
Electric Fans	2,248	278	-	448	407
Freezers	6,784	10,130	-	1,987	3,573
Incandescent Lighting	-	-	-	-	-
Other lighting	283	771	-	1,557	719
Refrigerators	10,305	3,976	-	688	3,122
Televisions	99	3,531	-	2,699	2,458

<sup>4</sup> indicates missing data.

The use of methyl bromide to fumigate goods prior to export is exempt from control under the Montreal Protocol (Figure 2.11). Nevertheless, the Solomon Islands and other parties were still encouraged to minimise its use for QPS. Consumption has remained relatively stable over the last seven years with variation from year to year.

Through the implementation of the phase out activities contained in the National Strategy and Action, Solomon Islands ODS consumption is projected to continue to fall within the required limit to achieve the country’s compliance with its obligations under the Montreal Protocol.

### Impact

Ozone-depleting substances are continuing to make a significant contribution in destroying the ozone leading to the global climate concern and increased harmful UV rays. While Solomon Islands does not produce any ODS, the trend of consumption still comes from bulk importation of ODS containing products and domestic retails. Phasing out ODS is the country’s commitment to avoid a dangerous level of interference with the ozone layer.

### Response and recommendations

Through the Department of Mines and Energy, the Government of Solomon Islands bans the importation of gases containing ODS under the Prohibition and Restriction Act. As ODS are mostly contained in refrigerators, the prohibited refrigerants are Refrigerant 11, Refrigerant 12, and Refrigerant 502. Firefighting gases such as Halon 1211 and Halon 1301 are also banned (TARD, 2007). Since 2003, ‘train the trainers’ programmes were rolled out on good practices with refrigeration as a nationwide approach to reduce ODS consumption in refrigeration and air conditioning



**FIGURE 2.10.** Confiscated Gas (R12) from the Solomon Islands Ports Authority (PORTS). Contains different labels outside but inside is R12 gas which was totally banned in the country (© National Ozone Unit, MMERE).



**FIGURE 2.11.** CFC emitting products in the Solomon Islands are mostly imported. © Stuart Chape.

In line with the current National Development Strategy 2016–2035; MTS 11 “Manage the environment in a sustainable resilient way and contribute to climate change mitigation”, Solomon Islands is already mainstreaming climate change considerations into different Ministries’ work plans. The NDS has a range of strategies and policies for climate impact mitigation measures, and to support ODS phase out.

It is recommended that:

- Solomon Islands continue to respond to ODS governance systems as required under the ODS Act and the protocols.
- Strengthen close observance on entry of ODS and ODS containing equipment into the country.
- Develop an accurate database of ODS consumers, ODS imports and consumption for continuous monitoring and store information records and data in the Solomon Islands Data Portal (Inform project).
- Develop minimum standards and legislate on the type of air-conditioning and refrigerators imported into the country.



## References

Ministry of Development Planning and Aid Coordination, National Development Strategy 2016–2035, Honiara, Solomon Islands.

United Nations Environment Programme, 'Ozone Secretariat' Accessed on 10th January 2019, [https://ozone.unep.org/countries/data?query\\_key=?format=annex\\_sums&report=CalcCons&output=ODP&parties=SB&year\\_from=2012&year\\_to=2019&filter=non-zero&](https://ozone.unep.org/countries/data?query_key=?format=annex_sums&report=CalcCons&output=ODP&parties=SB&year_from=2012&year_to=2019&filter=non-zero&).

Solomon Islands Second National Communication to the United Nations Framework Convention on Climate Change (UNFCCC), 2017.

TARD, <http://toabaita-authority.blogspot.com/2007/07/solomon-islands-government-ban.html>.

SPREP (2003) Report on the Train the Trainers Workshop on Good Practices in Refrigeration, Honiara, Solomon Islands.



**GREENHOUSE GAS EMISSIONS**

Estimates of anthropogenic emissions and removals of greenhouse gases (GHG) from economic sectors. The indicator presents sectoral annual trend based on the best available estimate in a given period for atmospheric emissions of CO<sub>2</sub> equivalent.

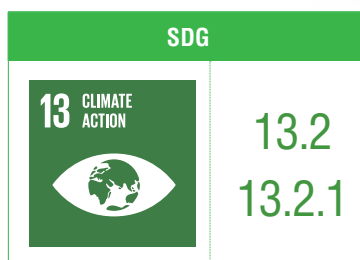
- **Unconditional commitments:** reduce emissions by 12% below 2015 level by 2025 and 30% below 2015 by 2030.
- **Conditional commitments:** reduce emissions by 27% by 2025 and by 45% by 2030, and by 50% by 2050.
- **Forestry:** trend is deteriorating for sea and land transport and waste. Improving in electrification (Energy).



**Status**  
Poor

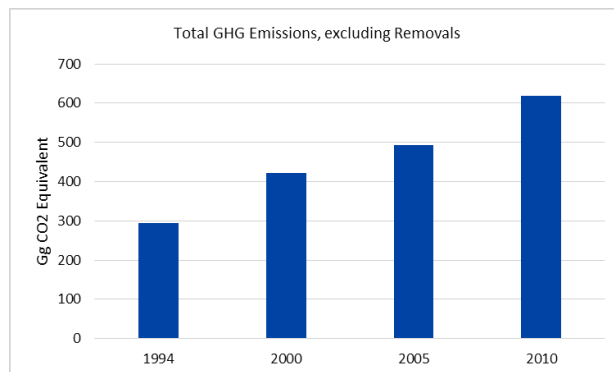
**Trend**  
Deteriorating

**Data confidence**  
Medium



**TABLE 2.2.** Summary of Solomon Islands GHG emissions (CO<sub>2</sub> equivalent)

Sector	Gg CO <sub>2</sub> equivalent			
	1994	2000	2005	2010
Energy	294	192.22	235.03	350.64
Industrial Processes	NE	-	-	-
Solvents and other Products Use	NE	NE	NE	NE
Agriculture	NE	70.35	73.66	76.39
Land Use Change and Forestry (LUCF)	NE	NE	NE	NE
Waste	NE	159.71	184.33	191.58
Total GHG Emissions, excluding Removals	294.38	422.28	493.02	618.61



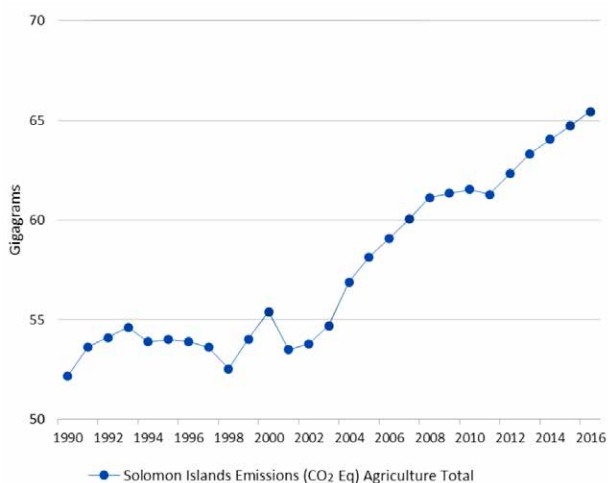
**FIGURE 2.12.** Total greenhouse gas emissions in the Solomon Islands 1994–2010 (Government of Solomon Islands 2017).

Photos: Julie Callebaut/SPREP

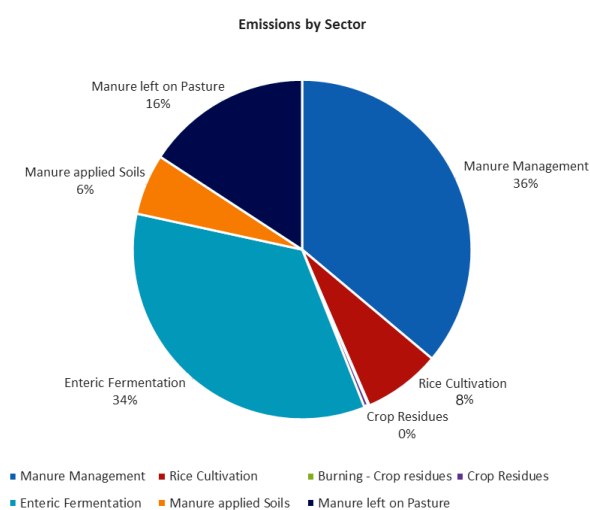


## Status and trend discussion

Due to limitations in national data the GHG inventory was restricted to the energy sector (transportation and electricity generation), waste (solid waste disposal sites, wastewater and sewage), industrial processes (food and drink) and agriculture (waste from livestock). Emission levels were not calculated and included in the report for rice cultivation (due to the very small area of paddy rice in the country and also lack of appropriate data) and synthetic fertilisers (due to their low level of usage and also lack of appropriate data). Emissions from land use, land use changes, and forestry and product use was not assessed. Table 2.2 summarises the country's emissions and removals (level of CO<sub>2</sub> removed from the atmosphere by forests) for 1994 (from initial national communication), 2000 (base year), 2005 and 2010 (as per best possible available sectorial data). These data show an increase in GHG emissions from all sectors over this time period (Figure 2.12).



**FIGURE 2.13.** Emissions (CO<sub>2</sub> Eq) Agriculture Total (<http://www.fao.org/faostat/en/#country/25>).



**FIGURE 2.14.** Emissions within Agriculture Sector (<http://www.fao.org/faostat/en/#country/25>).

The Solomon Islands Second National Communications to the UNFCCC reported that each sector emits different types and levels of greenhouse gases. The energy sector was only able to accomplish reporting on CO<sub>2</sub> emission; whereby there was a decrease in emission from 1994 till 2000, and it increased in 2010 to 350.64 Gg CO<sub>2</sub> mainly due to the use of petroleum fuel products for its various energy requirements. Fuel consumption has been increasing ever since the end of the civil war in 2003, with 2011 consumption of 63.78gg estimated to be 48% higher than the level of 43.00gg in 2003 (CDM, 2012).

CO<sub>2</sub> is the dominant GHG emission and the trends in emissions, without forestry, over the coming years is expected to increase, albeit still at a globally low level, with rising populations and planned establishment of new mining, fishing and agriculture industries. Logging also contributes to the overall loss of carbon: if these are included in the country's total emissions, it makes Solomon Islands one of the largest GHG emitters per capita in the Pacific.

Greenhouse gas emissions from the agriculture sector have increased and the trend is projected to increase (Figures 2.13, 2.14). Globally, the same trend is mainly driven by population growth and change in dietary preferences. The data indicates that the main source of emissions within agriculture is from manure management (36.1%), followed by enteric fermentation (34.4%).

## Impact

The Solomon Islands' Intended Nationally Determined Contribution report noted that emissions from Solomon Islands (as at 2015) are approximately 20 Mt CO<sub>2</sub>e/year representing approximately just 0.01 % of global emissions. Solomon Islands emissions are therefore low (on a global scale) but are expected to rise under current scenarios. Solomon Islands needs to play its role in the global effects to mitigate the effects of climate change, and adapt to its effects. At the same time, it must extend access to 'affordable and clean energy' (SDG 7) to those that need it. The role of logging/deforestation contributes to the overall emissions scenario as well as having significant effects on biodiversity and the state of the environment.

## Response and recommendations

Solomon Islands has developed a number of national policies and strategies that when effectively implemented can contribute to mitigation or the reduction of emissions.

The National Energy Policy Framework includes policies and strategies that can contribute to climate change mitigation including:

- Fuel conservation and efficiency in the transport sector: ii) Promote and implement renewable energy programmes and initiatives including research and development, iii) Use of energy resources in an environmentally sustainable manner, and iv) promotion and implementation of energy conservation and efficiency measures.

The National Agriculture and Livestock Sector Policy (2009–2014) includes a policy objective to ‘mitigate the effect of climate change’ and includes policy statements and focussed activities such as: i) Developing mitigation plans, ii) Conservation farming such as agro-forestry, and iii) Discourage slash and burn methods (shifting agriculture).

The National Solid Waste Management Strategy and Action Plan (2009–2014) include actions to establish proper sanitary landfills to minimise burning on site and provide the opportunity for methane capture.

Solomon Islands Intended Nationally Determined Contribution report presented a suite of mitigation actions planned and funded as the Solomon Islands Contribution (Table 2.3).

Further recommendations include:

- Continue to monitor emissions across all sectors
- Develop renewable energy and energy efficiency measures to reduce emissions

- Develop measures to control emissions from logging
- Land and Crop Management – through adjusting methods of managing land and growing crops
- Livestock management – adjust feeding practices to reduce the amount of CH<sub>4</sub> resulting from enteric fermentation.
- Manure Management - controlling the way in which manure decomposes to reduce CH<sub>4</sub> emissions
- Improve Green House Gas Inventory for Solomon Islands
- National Waste Management Strategy developed and implemented

## References

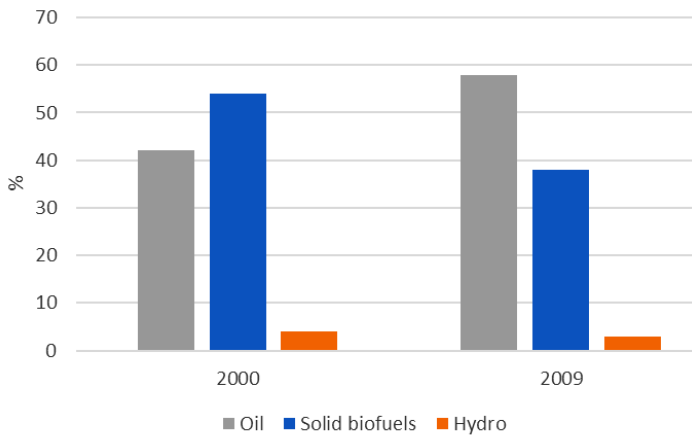
Government of the Solomon Islands, (2017). Solomon Islands Second National Communication. MECDM, Honiara.

**TABLE 2.3.** Solomon Islands Nationally determined contribution (mitigation).

Sector: Energy					
Mitigation option	INDC type	Mitigation in 2025 (tCO <sub>2</sub> e)	% of 2025 projected inventory	Mitigation in 2030 (tCO <sub>2</sub> e)	% of 2030 projected inventory
Fiu Hydropower	Renewable energy (RE)	12,220.2	14.7%	24,440.4	11.52%
Solar Farm	RE	2036.7	2.5%	4,073.4	1.92%
Tina Hydropower	RE	91,244.2	109.9%	319,354.5	150.48%
Solar Homes	RE	1697.3	2.0%	3,394.6	1.60%
Mini Hydropower	RE	1303.5	1.5%	4,562.2	2.15%
Energy Usage	Energy Efficiency (EE)	1629.4	2.0%	3258.8	1.54%

RENEWABLE ENERGY SOURCES

The percentage contribution of renewable energy to total energy production.



**FIGURE 2.15.** % contribution of main energy source in the Solomon Islands in 2000 and 2009. Solar and liquid biofuels each contributed 0.1% to the total energy supply in 2009 (IRENA 2009).

**TABLE 2.4.** Solar projects for Rural Boarding schools funded by Government of Italy (© Energy department, MMERE).

Rural schools	Province	Status	Year
Gela Ilau CHS	Central	completed	2009
Kopiu CHS	Guadalcanal	completed	2009
Muana CHS	Isabel	completed	2008
Adaua CHS	Malaita	completed	2010
Aligegeo PSS	Malaita	completed	2014
Su'u NSS	Malaita	outstanding	
Balipa'a CHS	Temotu		
Saint Peterson CHS	Temotu	completed	2018
Luesalemba PSS	Temotu	completed	2018
Pirupiru CHS	Makira/Ulawa	completed	2014
Gerasi CHS	Western	completed	2014
Beulah CHS	Western	completed	2009
Eleoteve CHS	Western	completed	2012
Moli CHS	Choiseul	completed	2018
Buruku CHS	Western	completed	2010
Pawa PSS	Makira/Ulawa	completed	2012
Goldie College NSS	Western	outstanding	



low MED high

Status  
Good

Trend  
Deteriorating

Data confidence  
Medium

SDG

7 AFFORDABLE AND CLEAN ENERGY

7.1; 7.1.2

7.2; 7.2.1

7.3

7.A, 7.B

Status and trend discussion

The Solomon Islands' Intended Nationally Determined Contribution report noted that emissions from Solomon Islands (as at 2015) are approximately 20 Mt CO<sub>2</sub>e/year representing approximately just 0.01 % of global emissions. Solomon Islands emissions are therefore low (on a global scale) but are expected to rise under current scenarios. Solomon Islands needs to play its role in the global effects to mitigate the effects of climate change, and adapt to its effects. At the same time, it must extend access to 'affordable and clean energy' (SDG 7) to those that need it.

In 2009 54.5% of Solomon Islands total primary energy supply was from renewable sources, mostly solid biofuels (Figure 2.15). While 54.5% is a substantial contribution from renewable energy, most of this was solid biofuels used in household cooking, a practice associated with poor air quality and respiratory illness (see Air quality indicator). At the same time only 15% of the population had access to electricity and the per capita electricity use was 142 kWh, 354 kWh below the per capita use for Melanesia combined. As Solomon Islands continues to develop its energy requirements will increase and this was reflected in the increase in power generated by oil (mostly diesel generators) between 2000–2009 (Figure 2.14).

A current World Bank-funded project titled 'Electricity Access and Renewable Energy Expansion Project' will deliver renewable energy mini-grids, electricity connections in low-income areas, and new grid-connected solar power ([www.worldbank.org](http://www.worldbank.org)). Agreements have also been recently signed to increase renewable energy generation through the Tina River Hydropower Project which aims to increase the amount of renewable energy in the Honiara grid to nearly 100% ([www.worldbank.org](http://www.worldbank.org)).

In 2013 ADB funded a diesel blend coconut oil generator at SP power station in Auki, Malaita Province. After the installation the Department of Energy assisted a coconut supplier at Ranadi in 2014. Recently the Department of Energy did nothing on coconut biofuel since coconut/copra is more expensive than diesel fuel. Biofuel is not a stable source of energy in Solomon Islands due to fluctuation in market price for copra. There was limited supply at times, and it became more expensive than petroleum.

Table 2.4 shows the solar projects for rural boarding schools funded by Italy through the Department of Energy. The project aimed to electrify 17 rural boarding schools in Solomon Islands. The project was implemented in three phases and now the Department of Energy is at Phase 3. Two schools are yet to be completed, awaiting a last tranche of funding from the funding agency.

#### CONSTITUENCY RURAL ELECTRIFICATION PROGRAMME FUNDED BY SIG DEVELOPMENT BUDGET.

This programme started in 2013 and ended in 2017. Under this programme the department used solar standalone systems that range from 20 watts up to 50 watts, replacing kerosene which is very expensive and also contributed to air pollution. Department of Energy supplied solar systems to all 50 constituencies in the country.

The Government of Italy is also funding community standalone solar grid pilot projects for 18 targeted communities from three provinces namely: Western, Malaita and Central Provinces. Implementation commences in 2019.

The Department of Energy has been carrying out several micro-hydro projects for rural communities in 2018. The communities were: Palaghati, weather coast South Guadalcanal, Fox Bay, west Guadalcanal and Naraharau, East Makira.

The three micro hydro projects are still waiting for turbines purchased overseas before installation.

The Solomon Islands Government (SIG) with assistance from the Asian Development Bank (ADB) provides support for development and operation of grid-connected solar-diesel-battery power stations in seven provinces, which would largely substitute for existing diesel generation. These include the provincial towns of Kirakira and Namugha in Makira-Ulawa province, Maluú and Hauhui in Malaita Province, Munda and Vonunu in Western province, Lata in Temotu Province, Tulagi in Central Province, Sasamunga in Choiseul Province. All these Hybrid Generation system projects are now in their implementation stages. Four projects are still in tender stages. They are Visale solar hybrid mini-grid, Tingoa solar hybrid mini-grid, Henderson solar farm 2MW extension and Ranadi HQ roof solar installation project. Other projects which are in planning stages are; Tanagai point of supply – 1MW solar farm, Auki solar hybrid project and three new solar hybrid projects (Lambi, Santa Ana & Ulawa).

## Impact

Burning fossil fuels contributes to global greenhouse gas emissions and leaves countries and their residents vulnerable to fluctuating oil and gas prices and availability.

## Response and recommendations

The National Energy Policy Framework includes policies and strategies that can contribute to climate change mitigation including;

- Fuel conservation and efficiency in the transport sector: ii) Promote and implement renewable energy programmes and initiatives including research and development, iii) Use of energy resources in an environmentally sustainable manner and, iv) promotion and implementation of energy conservation and efficiency measures.
- The National Agriculture and Livestock Sector Policy (2009–2014) includes a policy objective to “mitigate the effect of climate change” and includes policy statements and focussed activities such as i) Developing mitigation plans;, ii) Conservation farming such as agro-forestry, and iii) Discourage slash and burn methods (shifting agriculture).
- The National Solid Waste Management Strategy and Action Plan (2009–2014) include actions to establish proper sanitary landfills to minimise burning on site and provide the opportunity for methane capture.

## Recommendations

- Set clear targets on renewable energy interventions on the new energy policy and provide support to the implementation of the National Energy Policy Framework.
- Encourage Private Sector partnerships promoting renewable technology.
- Put in place standards and monitoring systems on renewable energy appliances.
- Waste Management systems to be put in place for renewable energy appliances.
- Encourage use of renewable energy technology.
- Put in place a guideline on securing customary land on big energy projects. This guideline to cover awareness, negotiation etc.
- Invest in renewable energy of all sizes to solve electricity accessibility to communities.
- Invest in capacity building on renewable energy maintenance and sustainability.

## References

IRENA, 2009. Renewable energy country profile: Solomon Islands. IRENA, International Renewable Energy Agency. Available: <https://www.theprif.org/documents/solomon-islands/energy-power-generation/renewable-energy-country-profile-solomon-islands>.

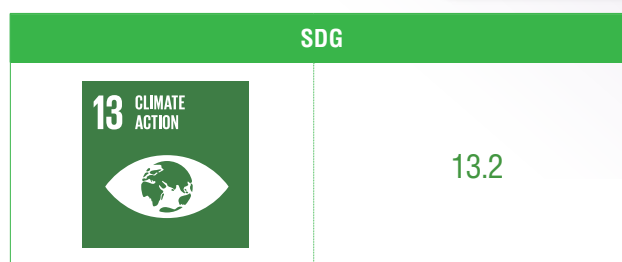
Solomon Power Development Project, Second Semi Annual Report 2018. Available: <http://solomonpower.com.sb/projects/solar-power-development-project/>

**PHYSICAL CLIMATE**

Observation of climate variables to understand the annual change in the frequency and/or intensity of extreme weather events over 30 years. Parameters measured include temperature (°C), rainfall (mm), sea level rise (mm) and wind velocity.



**Status**  
Good  
**Trend**  
Deteriorating  
**Data confidence**  
Medium



**Status and trend discussion**

In the period 1969–2010, the number of cyclones passing within 400km of Honiara varied, with none in some seasons and up to five in others (Figure 2.16). Cyclones occurred more frequently in El Niño years and less frequently during La Nina years.

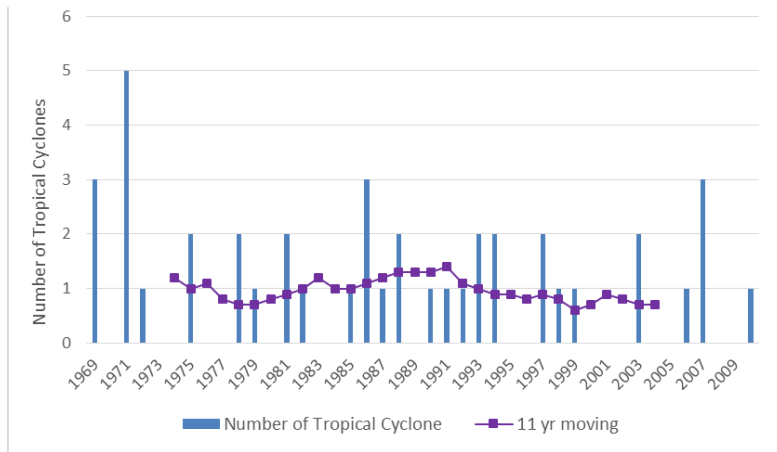
Meteorological records in the country over the past 50 years show a gradual rise in temperatures across the whole country, declining rainfall in some parts of the country, and increasing intensity of rainfall in other areas causing severe flood damage to properties and loss of lives (Figure 2.17). The small low-lying outer islands and low coastal areas are experiencing accelerated coastal erosion due to rising sea levels and salination of well water during storm surges and king tides. The El Niño phenomenon brings with it periods of very low rainfall and drought.

Observed data by the Solomon Islands Meteorological Services show that annual surface temperature for the western, central and eastern regions of Solomon Islands have increased during the last 30 to 50 years. The range of increase in mean air temperature for most provinces is between 0.14oC and 0.17oC/decade. A study carried out by the Pacific Climate Change Scientific Programme (PCCSP, 2011) under the Australian Government showed that for three emission scenarios (low, medium and high) using 18 Global Circulation Models, the temperature in the Solomon islands will increase by 0.2oC in 2030 and by 3.3 oC in 2090. The sea surface temperature (SST) is also projected to increase in the next 30–70 years in Solomon Islands.

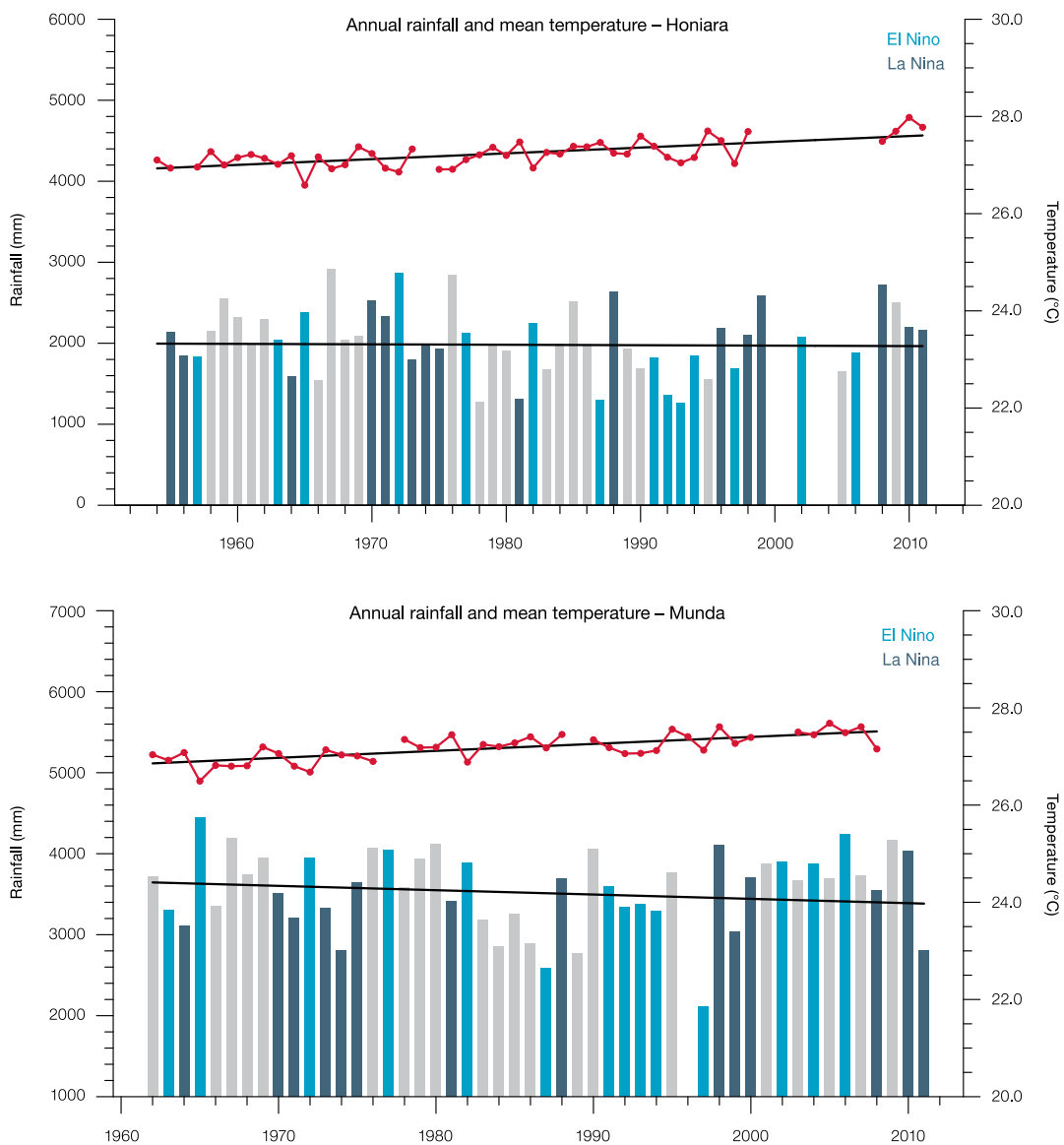
Sea level records require long time series before trends can be interpreted with confidence. With sea level monitoring, technical aspects of the process add additional layers of complexity. The most recent Solomon Islands country report produced by the Australian Bureau of Meteorology dates from 2010 (Figure 2.18). This draws on ‘Sea Level Fine Resolution Acoustic Measuring Equipment’ (SEAFRAME) gauge data from Pacific Island countries. The Solomon Islands Second National Communication (Solomon Islands Government, 2017) cites satellite altimetry readings indicating that Solomon Islands is experiencing sea level rise at a rate of 8–10 mm per year – high in global terms.

The observed and projected sea level near Solomon Islands is predicted to increase over the coming years relative to the increasing global temperature as reported in the PACCSAP Programme, 2014 (Figure 2.19). The purple colour indicates observation results for sea level since the late 1970s from tide gauge readings, whilst the satellite readings are represented by the green colour. The black line indicates reconstructed sea level from available data in the Solomon Islands since the 1950s. The red solid line indicates multi-model mean projection for sea level rise from 1995 to 2100 relative to increasing emission situations which are represented by the blue colour. The red and blue shaded regions in the graph shows associate unconfirmed errors likely to occur with the projection at a probability of 5–95%.



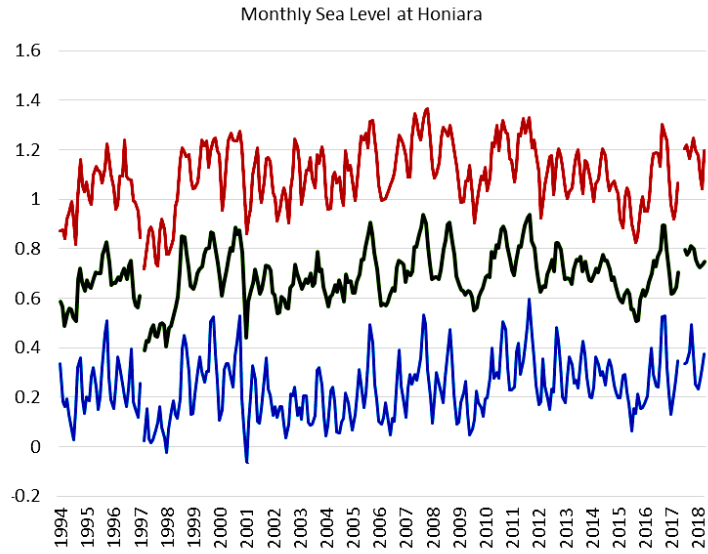


**FIGURE 2.16.** Number of Tropical Cyclones passing within 400km of Honiara ([https://www.pacificclimatechangescience.org/wp-content/uploads/2013/06/13\\_PCCSP\\_Solomon\\_Islands\\_8pp.pdf](https://www.pacificclimatechangescience.org/wp-content/uploads/2013/06/13_PCCSP_Solomon_Islands_8pp.pdf)).

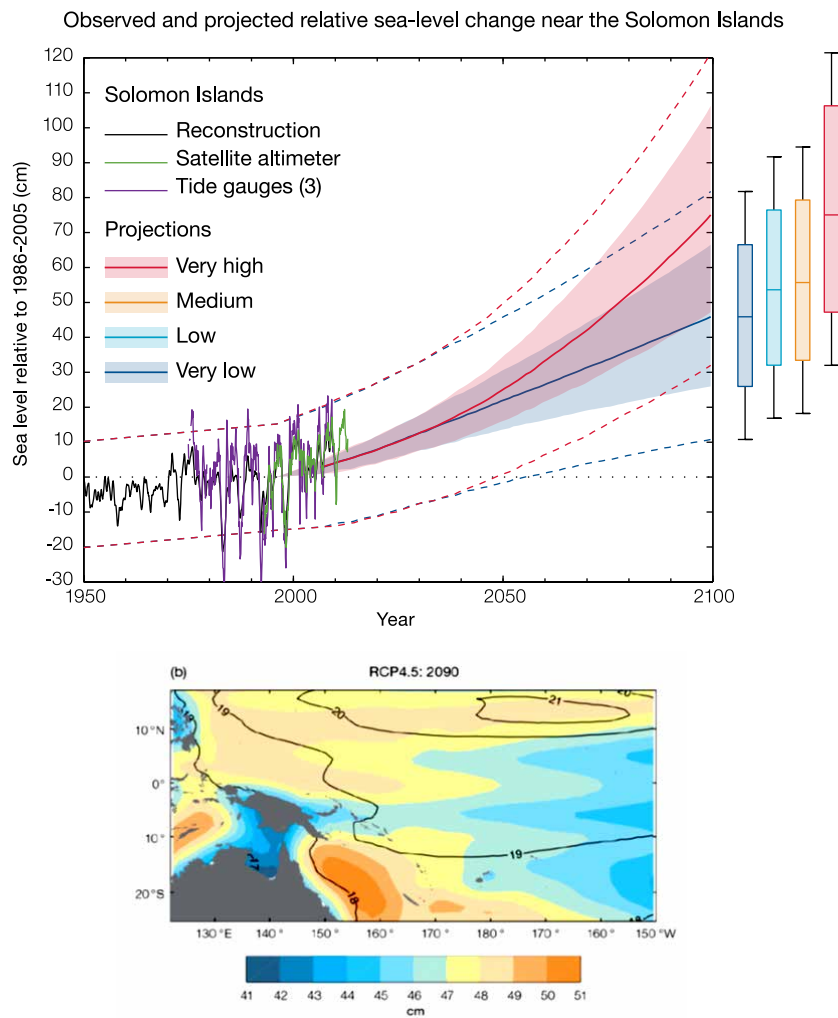


**FIGURE 2.17.** Annual rainfall and temperature Honiara and Munda (Pacific Climate Change Science Program). Annual average air temperature (red dots and line) and total rainfall (bars) at Honiara (top) and Munda (bottom). Light blue, dark blue and grey bars indicate El Niño, La Niña, and neutral years respectively. No bars indicate that data are not available. The solid black lines show the trends.



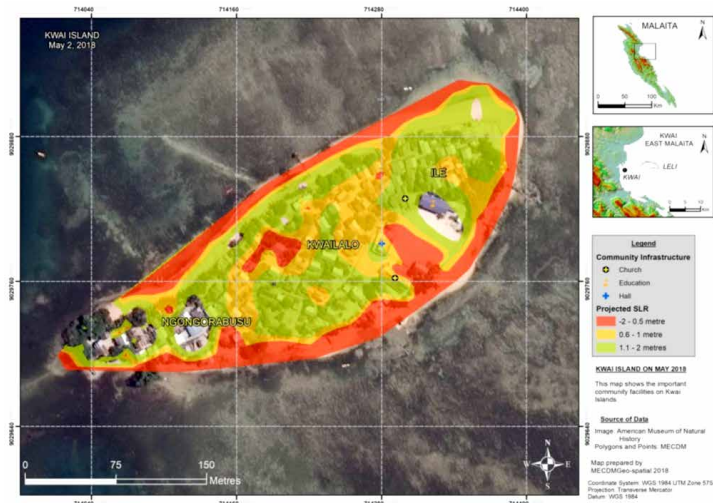


**FIGURE 2.18.** Monthly Sea Level at Honiara (<http://www.bom.gov.au/ntc/ID070061/ID070061SLI.shtml#stats>).



**FIGURE 2.19.** (a) projected sea level near Solomon Islands, (b) distribution of projected sea level rise. (PACCSAP Programme, 2014)





**FIGURE 2.20.** Areas likely to be inundated by projected sea level rise on Kwai Island, Malaita Province (Kwai Island Coastal Vulnerability Assessment, 2018).

The map provided by the PACCSAP Programme, 2014 (Figure 2.20) shows the distribution of projected sea level rise in Solomon Islands with reference to various scenarios. The average projected changes are indicated by the shading colours whilst the estimation for the uncertainty associated with the projection is represented by the contour lines on the map. A case study for Kwai Island revealed the projected magnitude of inundation from sea level rise (Figure 2.21).

### Impact

Solomon Islands is highly vulnerable to droughts, extreme rainfall, floods, king tides and sea level rise. Droughts are usually associated with the El Niño phenomenon. The 1997/98 El Niño caused severe drought conditions in many parts of the country. One of the major prolonged droughts occurred in the eastern part of the country in the Temotu province in 2004 causing food and water shortages. Another major problem associated with extremely high rainfall or prolonged rainfall is the decline in the yields of sweet potato, the main staple crop in rural areas, due to increased vegetative growth and decline in the growth of tubers. Flooding can also occur as a result of a combination of factors, including king tides, intense storms, and rising sea levels. In 2008 king tides struck northern Choiseul, Ontong Java and other parts of the country. These came in the form of high swells never before experienced in the islands. The tides caused more coastal erosion, considerable damage to coral reefs, coastal inundation, pollution of water sources and damage to coastal infrastructure.

Tropical cyclones pose a serious threat to the people, economy and environment and result in flooding and wind damage in the Solomon Islands. There have been severe floods on Guadalcanal, Malaita, Makira and Santa Isabel in recent years with a number of lives lost, and severe damage to agriculture and Infrastructure. In 2002 the remote island of Tikopia was hit by a Category 5 cyclone Zoe.



**FIGURE 2.21.** Coastal erosion caused by sea level rise at Kwai Island. (Kwai Island Coastal Vulnerability Assessment, 2018).

In the Solomon Islands, projections tend to show a decrease in the frequency of tropical cyclones by the late 21st century but an increase in the proportion of the intense storms.

Sea level rise is already affecting Solomon Island communities, for example:

The Lau Lagoon - northeastern Malaita: (<https://www.dw.com/en/climate-change-drives-solomon-islands-people-of-the-sea-ashore/a-40777201> )

Ontong Java: (<https://www.dw.com/en/climate-change-drives-solomon-islands-people-of-the-sea-ashore/a-40777201> )

Choiseul Bay township Choiseul Province: ([https://coastadapt.com.au/sites/default/files/case\\_studies/CSS3\\_Relocation\\_in\\_the\\_Solomon\\_Islands.pdf](https://coastadapt.com.au/sites/default/files/case_studies/CSS3_Relocation_in_the_Solomon_Islands.pdf))

These climate conditions, exacerbated by climate change, will present challenges across many sectors including agriculture, fisheries, biodiversity, water resources and people’s health – some of these issues are discussed further in the relevant thematic areas.

The Kwai Island Coastal Vulnerability assessment 2018 (Figures 2.20, 2.21) shows the current impacts caused by sea level rise to one of the very small islands in the Solomon Islands. Joshi & Manuao, 2012, has mentioned that Kwai Island is densely populated with about 700 residents (Kwai Island coastal Vulnerability assessment, 2018). The highest ground on the Island is about four metres above sea level, making it vulnerable to the impact of sea level rise. Figure 33 shows the areas likely to be inundated by projected sea level rise. Apart from the risk to the residents, key community infrastructure like community halls, churches and schools will also face potential impacts from sea level rise.

## Response and recommendations

Solomon Islands has developed several national policies and strategies to support adaptation to the effects of climate change. The National Development Strategy (NDS 2016–2035) makes explicit reference to climate change as a threat to the livelihood of Solomon Islanders. Consequently, the NDS has a policy objective aimed at integrating national environmental issues in a holistic way to adapt to climate change and variability, halt deterioration of the eco-systems, restore damaged ecosystems and ensure their survival in the long term to benefit Solomon Islanders.

The National Adaptation Programmes of Action (NAPA), produced in 2008, identifies adaption priorities across a range of sectors including: agriculture and food security, water supply and sanitation, waste management, coastal protection, fisheries, infrastructure, tourism, human settlements and human health. A successor document, the National Adaptation Plan (NAP), is being developed to address long-term effects of climate change.

The Solomon Islands' Intended Nationally Determined Contribution report explains that the Climate Change Policy (2012–2017), linked to the National Development Strategy (2016–2035), provides a policy framework for developing and describing ongoing and planned actions (changes in institutions, modified policies and measures, major projects/programmes, planning processes, and financial investments) using international and country resources.

The report noted the intention of the Solomon Islands Government that a community-based vulnerability mapping, adaptation planning and management approach (tied to direct access to financing for community-based resilience-building projects) be employed on a whole of island basis. This will build capacity in vulnerable villages for localised adaptation actions which will contribute to the implementation of adaptation measures. Special emphasis has also been placed on ecosystem-based adaptation initiatives.

On the issue of financing, the report observed that some adaptation projects have been grouped into thematic areas linked to the priority sectors established in the NAPA as well as some recently identified priorities. The total

adaptation cost would be US\$126 million. NAPA actions would cost US\$17 million covering agriculture and food security, water and sanitation, human settlements and human health, education awareness and information; low-lying and artificially built-up islands; waste management; coastal protection; fisheries and marine resources, infrastructure development and tourism. Other priorities identified through the national communication process would cost US\$109 million. It is expected that a considerable portion of the necessary financing will be in the form of grants from the Green Climate Fund, Global Environment Facility (GEF), Adaptation Fund, and from various bilateral climate change programmes.

Adaptation actions targeting the needs of Honiara are set out in the Honiara Urban Resilience and Climate Action Plan (2016).

A National Resettlement Policy is also in preparation, including the issue of resettlement of people displaced by the effects of climate change.

## Recommendations

Develop national and regional climate profile with a monitoring system put in place.

Review of the INDC and National CC Policy.

Develop the National Resilience Framework in line with FRDP.

## References

- Pacific Climate Change Science Program (2011). 'Current and future climate of the Solomon Islands' [https://www.pacificclimatechangescience.org/wp-content/uploads/2013/06/13\\_PCCSP\\_Solomon\\_Islands\\_8pp.pdf](https://www.pacificclimatechangescience.org/wp-content/uploads/2013/06/13_PCCSP_Solomon_Islands_8pp.pdf)
- Solomon Islands Government (2017). Solomon Islands Second National Communication. MECDM, Honiara.
- PACCSAP Programme (2014). Climate Variability, Extremes and Change in the Western Tropical Pacific: New Science and Updated Country Reports. Australia Government, Australian Aid.
- Reginald Reuben (2018). Kwai Island Coastal Vulnerability Assessment. CLIMATE CHANGE DIVISION, Ministry of Environment Climate Change Disaster Management and Meteorology, Honiara.

Photos: Julie Callebaut/SPREP





## THEME 3 COASTAL AND MARINE




Photo © Stuart Ghang





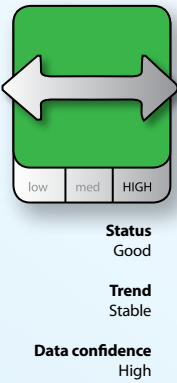
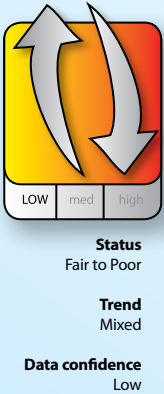
## THEME 3 COASTAL AND MARINE



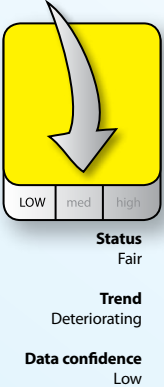
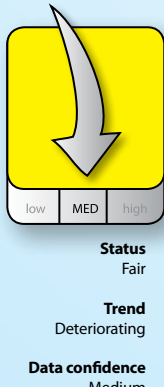
The marine and coastal area is of enormous importance for the Solomon Islands, being a reservoir of rich biodiversity and source of livelihoods, revenue, and cultural significance.



COASTAL AND MARINE HIGHLIGHTS

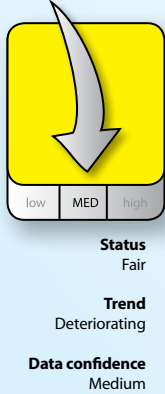
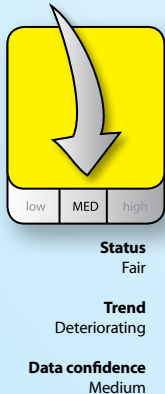
INDICATOR	STATUS AND TREND	KEY FINDINGS	RESPONSE AND RECOMMENDATIONS
<p><b>OFFSHORE TUNA FISHERIES AND BY-CATCH</b></p>	 <p><b>Status</b> Good</p> <p><b>Trend</b> Stable</p> <p><b>Data confidence</b> High</p>	<p>Solomon Islands tuna fishery is dominated by foreign purse seine and longline vessels.</p> <p>The overall total catch by all fishing vessels licenced by Solomon Islands in 2017 was 159,880.04 tons of tuna.</p> <p>Overall change in catch from 2016 to 2017 was: 3% increase for skipjack tuna, 3% decrease for yellowfin, 1% decrease for bigeye, and 1% increase for albacore.</p> <p>No substantial increase or decline in tuna catch over the period 2013–2017.</p> <p>In 2017 the European Union lifted it's cautionary 'yellow card' on the Solomon Islands fishery.</p> <p>2018 tuna catch.</p> <p>Purse seine electronic reporting is currently 100% coverage.</p> <p>Need major by-catch data (Wahoo, Swordfish, Blue Marlin, Barracuda).</p> <p>2015 MACBIO ESV report (Tuna Offshore)</p>	<p>Fisheries Management Act 2015 and regulations provide basis for fisheries controls and their enforcement.</p> <p>Improve electronic monitoring and reporting on the fishing industry for management.</p> <p>Solomon Islands tuna fisheries are guided by the Tuna Management and Development Plan (TMDP), currently under review, and the Harvest Strategy and other regional tuna fisheries management frameworks.</p> <p>Solomon Islands Ministry of Fisheries is currently reviewing its Tuna Management and Development Plan. Harvest strategy for the key tuna species is ongoing and it is vital to consider the economic benefits, employment, catch and effort and the overall development of the domestic tuna fishery.</p> <p>'Ocean12' process has identified a set of priorities for Integrated Oceans Governance which are to form the basis for a National Oceans Policy.</p> <p>Implement Solomon Islands National Oceans Policy.</p> <p>Implement IUU measures.</p> <p>Consider Ocean Act under the <i>Ocean12</i>, that will consider legislation for deep sea development.</p>
<p><b>MARINE SPECIES OF SPECIAL INTEREST</b></p>	 <p><b>Status</b> Fair to Poor</p> <p><b>Trend</b> Mixed</p> <p><b>Data confidence</b> Low</p>	<p>Marine turtles are harvested for traditional use, however some illegal trade of turtles is also occurring.</p> <p>Annual estimated catches of whales by the purse seine national fleet in the WCPFC area show a decline in the catch of False killer whales from 2013 to 2017.</p> <p>A few villages continue to hunt dolphins and levels of dolphin removal are a concern for depletion of local populations.</p> <p>Dugong and shark population size and status is a data gap.</p> <p>Overfishing has placed the sea cucumber industry in danger of collapse. A sea cucumber development and management plan is in place.</p> <p>Sedentary organisms, geomorphological features.</p> <p>Crocodile survey report 2018 (population increased causing human to animal conflict – WorldFish and SIG report)</p>	<p>The Pacific Islands Regional Marine Species Programme 2013–2017, contains detailed Action Plans for marine turtles, whales and dolphins and dugongs.</p> <p>Fisheries Management (Prohibited Activities) Regulations 2018 were officially gazetted, prohibiting the hunting of dugong in the Solomon Islands.</p> <p>Under the Fisheries Management Act 2015 and Fisheries Management Regulations 2017, certain species used for traditional activities or purposes are exempted, including dolphin harvest for cultural purposes.</p> <p>More research. Consider sedentary, and deep-sea habitats as marine species of interest (Reference MACBIO data on geomorphological data – the seamounts and hydrothermal vents are habitats for the sedentary and other deep-sea organisms).</p> <p>Identify and establish migratory paths (whales and turtles).</p> <p>Take into account procedures used in prospecting for minerals and gas (e.g. air guns).</p> <p>Develop enabling legislation for deep sea mining and prospecting developments.</p> <p>Complete and finalise management plans for turtles, dugong, dolphin and crocodiles.</p> <p>Complete and finalise beche-de-mer/sea cucumber management plan.</p> <p>Promote species conservation programmes.</p>

COASTAL AND MARINE HIGHLIGHTS

INDICATOR	STATUS AND TREND	KEY FINDINGS	RESPONSE AND RECOMMENDATIONS
<p><b>SEAGRASS, MANGROVE AND CORAL REEF ECOSYSTEMS</b></p>	 <p><b>Status</b> Fair</p> <p><b>Trend</b> Deteriorating</p> <p><b>Data confidence</b> Low</p>	<p>In 2000 mangroves covered an area of about 47,000 ha or almost 2% of the Solomon Islands total land area.</p> <p>Mangrove forests have declined by at least 27% between 1970–2000 but no recent fine-scale assessments.</p> <p>In 2004 seagrass meadows were determined to be in relatively healthy condition compared to many other regions globally, though sedimentation from logging activities was identified as a major threat at some locations.</p> <p>The Solomon Islands have the worlds 2nd highest coral species diversity and in 2004 reefs and coral communities were generally in good condition.</p> <p>2015 MESV Report (MACBIO/SIG).</p> <p>Crown of thorns (COT) a threat to coral reefs (TNC data on Choiseul and Isabel).</p>	<p>Conduct a national Rapid Ecological Assessment for key ecosystems including remote sensing for distribution and coverage.</p> <p>Work towards a national baseline for seagrass and mangroves through remote sensing and follow-up ground assessments.</p> <p>Strengthen monitoring of status of seagrass, mangroves and coral reefs.</p> <p>Improve reporting and updating of ecosystem health and status by NGO partners and projects.</p> <p>Strengthening EIA for habitat protection and management.</p> <p>Promote education on sustainable resource management practices.</p> <p>Promote EABM, CBRM, R2R initiatives or programmes.</p> <p>Support establishment of MPAs, LMAs and <i>tabu</i> areas.</p> <p>Dugong and seagrass conservation and management strategy.</p> <p>Develop coral reef management plan.</p> <p>Continue Implementation of Coral triangle initiative on coral reefs, fisheries and food security and community-based resource management for food security</p> <p>Complete and finalise Coral/Coral reef/Coral sand and gravel management plans (consider exploitation) – current coral survey conducted by MFMR.</p> <p>Implement COT eradication programme.</p> <p>Explore “Blue Carbon” ecosystems opportunities.</p> <p>Implement REDD programme for mangrove protection.</p>
<p><b>MARINE PROTECTED AREAS</b></p>	 <p><b>Status</b> Fair</p> <p><b>Trend</b> Deteriorating</p> <p><b>Data confidence</b> Medium</p>	<p>In 2009 there were 113 active Marine Protected Areas representing inshore marine areas. 2016 (TNC/SIG) CBRM mapping conducted (CT ATLAS) records 216 sites of areas under management by communities supported by NGOs/CBOS and government.</p> <p>Fisheries management areas are used only for tuna fisheries (tuna management plan).</p> <p>No offshore marine protected/ managed areas established under Fisheries Management Act 2015 or Protected Areas Act 2010.</p> <p>The 169.09 km<sup>2</sup> Arnarvons Community Marine Park is the largest marine protected area in the Solomon Islands.</p>	<p>Promote and support establishment and management of marine protected or management areas,</p> <p>Finalise and implement the National Scaling Strategy for community-based resource management (CBRM).</p> <p>Regularly update records on marine protected areas via PIPAP, Environment Data portal, CTATLAS and World Database of Protected Areas system.</p> <p>Improve spatial data management capacity across SIG (MECDM and MFMR).</p> <p>Finalise the SI National Plan of Action for community-based resource management.</p> <p>Complete and implement marine spatial plan and its legal framework.</p> <p>Implement NBSAP - target of 15% MPAs.</p> <p>Support coastal protection under Environment, Fisheries and Protected Areas Acts.</p> <p>Track management effectiveness of marine protected areas (management effectiveness tracking tool for areas).</p>



COASTAL AND MARINE HIGHLIGHTS

INDICATOR	STATUS AND TREND	KEY FINDINGS	RESPONSE AND RECOMMENDATIONS
<p><b>COASTAL FISHERIES</b></p>	 <p><b>Status</b> Fair</p> <p><b>Trend</b> Deteriorating</p> <p><b>Data confidence</b> Medium</p>	<p>Coastal fisheries important to coastal communities for subsistence and livelihoods. Threats include overfishing, use of destructive practices and gear.</p> <p>Economic value (MACBIO MESV report for subsistence and artisanal fishing).</p> <p>Juveniles are over-represented in urban markets for most commercially important species, suggesting widespread overfishing.</p> <p>MFMR is implementing a FAD programme to support livelihoods and divert fishing pressure from coral reefs.</p> <p>Mariculture – seaweed in Wagina, Rarumana (Roviana lagoon).</p>	<p>Implement sales or import restrictions on vulnerable and iconic species and species important to ecosystem maintenance.</p> <p>Implement size limits and gear restrictions (mesh sizes, hooks) for overfished species.</p> <p>Implement a temporal restriction on sales during known spawning times for important species.</p> <p>Repeat baseline market surveys at 5–10 year intervals.</p> <p>Deploy new FADs.</p> <p>Implement the National Fisheries policy 2019–2029.</p> <p>Implement National Ocean Policy.</p>
<p><b>COASTAL WATER QUALITY</b></p>	 <p><b>Status</b> Fair</p> <p><b>Trend</b> Deteriorating</p> <p><b>Data confidence</b> Medium</p>	<p>Anecdotal evidence of poor coastal water quality due to logging activities (e.g. sediment), waterfront developments and waste management in some localities.</p> <p>PEBACC Project report – Honiara.</p> <p>IR2R report - Honiara and Wagina.</p> <p>Simon Albert, Marovo fish kill report.</p> <p>Simon Albert, Roviana Lagoon.</p> <p>TNC report on logging impacts on mangroves.</p> <p>Water quality test at Auki market.</p> <p>Sumitomo EIS.</p> <p>Goldrige Report by Simon Albert.</p>	<p>Developers are required to establish baseline coastal water quality and monitor / remediate any adverse effects.</p> <p>Enforce Environment Act and regulations for coastal developments.</p> <p>Implement the National Waste Management and Pollution Control Strategy.</p> <p>Monitor coastal waters.</p> <p>Improve capacity of the ECD and other responsible authorities (Shipping, ports, City councils, Provincial governments) for regulating and monitoring water quality standards.</p>

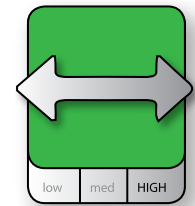
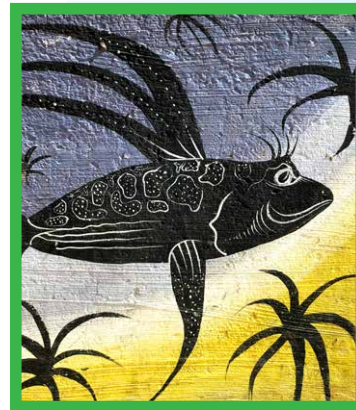




## OFFSHORE TUNA FISHERIES AND BY-CATCH

Annual tuna catch in tons for each species per year. Target is below maximum sustainable yield or target reference point.

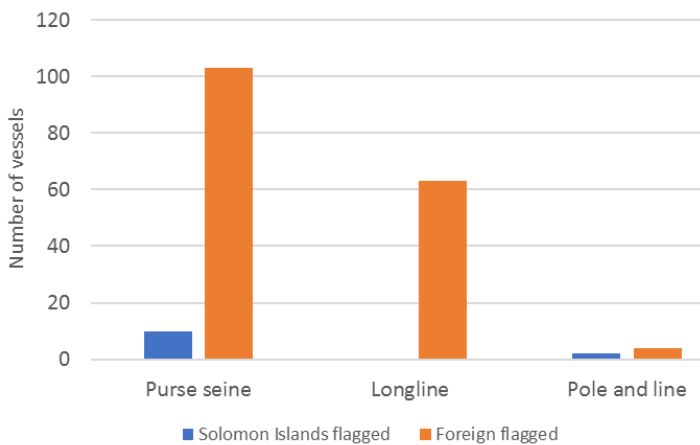
Maps on the 'Solomon Islands Longline Tuna Catch' and the 'Solomon Islands Purse Seine Tuna Catch' (MACBIO project) can be found in the MAP ANNEX.



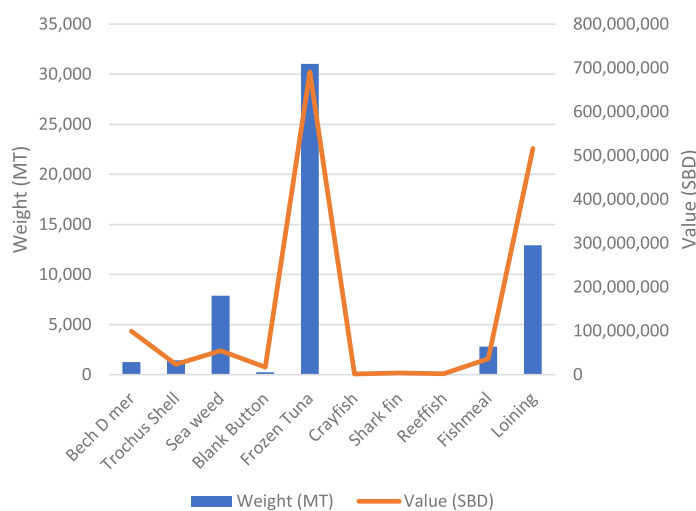
Status  
Good

Trend  
Stable

Data confidence  
High



**FIGURE 3.1.** Number of Solomon Islands and foreign licenced vessels by main fishing type operating in the Solomon Islands EEZ in 2017 (Ministry of Fisheries and Marine Resource 2018).



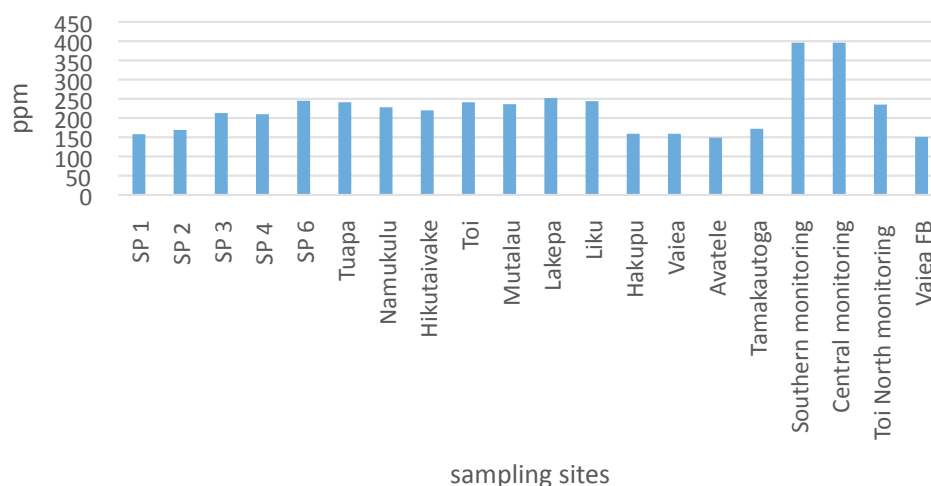
**FIGURE 3.2.** Marine products and tuna products exported from 2007–2018 (Ministry of Fisheries and Marine Resources, Offshore Division, Statistics and Information System Section, 2019).

CBD	SDG
	14.4, 14.4.1 14.6, 14.6.1 14.7, 14.7.1

### Status and trend discussion

The Solomon Islands tuna fishery is dominated by foreign vessels, mostly purse seine and longline (Figure 3.1). The Solomon Islands national fleet includes purse seine and pole and line vessels (Figure 3.1). In 2017, Solomon Islands licensed 267 fishing vessels to fish in the Solomon Islands' Exclusive Economic Zone (EEZ). 13 of these vessels were locally flagged (National Fleet) comprising 10 purse seiners, 2 pole and line, and 1 longline vessel (inactive). 145 vessels are locally based foreign fishing vessels which comprise 64 longliners, 4 light seiners, 64 carrier and 13 fuel bunker vessels (Ministry of Fisheries and Marine Resources 2018). Seafood products are important export commodities for Solomon Islands, particularly frozen tuna and loins (Figure 3.2).

The total catch by all fishing vessels licenced by Solomon Islands for 2017 was estimated at 159,880 tons of tuna. Skipjack tuna dominated total catches in 2017 with 84,682 tons caught by foreign purse seiners and 28,249 tons by local purse seiners (Figures 3.3, 3.4). The next largest catch in 2017 was yellowfin tuna, with 21,442 tons taken by the foreign fleet and 17,293 tons taken by the national purse seine fleet (Figures 3.3,3.4). Albacore (4651 tons) and bigeye tuna (1766 tons) also contributed to the overall catch in 2017 (Figures 3.3,3.4). The change in catch from 2016 to 2017 was: 3% increase for skipjack tuna, 3% decrease for yellowfin tuna, 1% decrease for



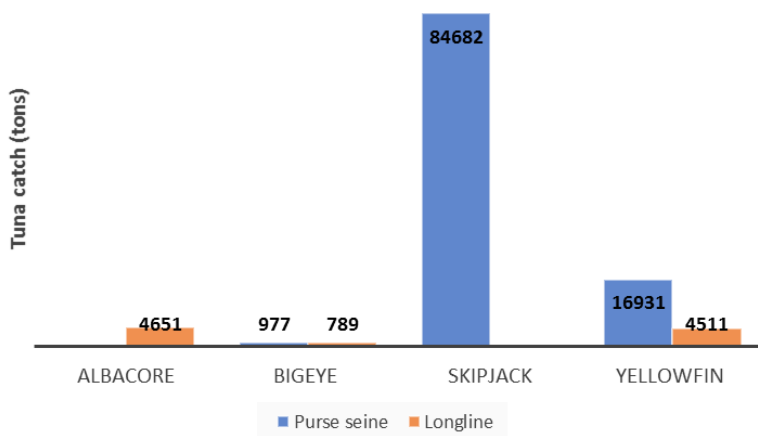
**FIGURE 32.** Water hardness (ppm). per bore site. Source: Hasan and Hetutu 2010.

**TABLE 11.** Hardness of bore waters in Solomon Islands. Water hardness: 0–60 ppm = soft; 61–120 ppm = moderately hard; >181 ppm = very hard. Source: Hasan and Hetutu 2010.

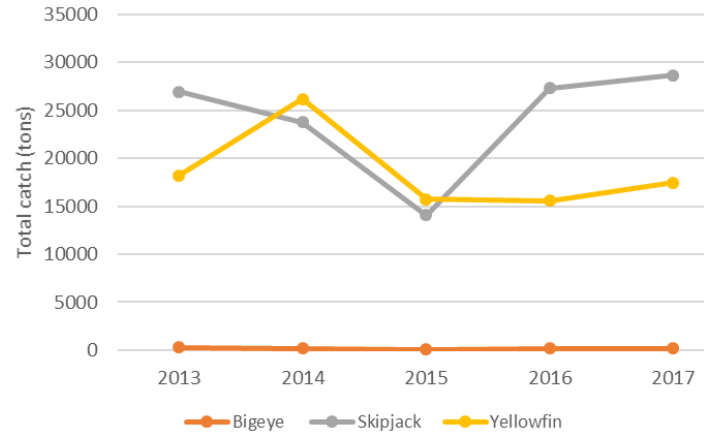
Sample Bore Name	Total Hardness ppm CaCO <sub>3</sub>	Nitrate – Nitrogen (ppm)
SP 1	158	0.46
SP 2	169	0.53
SP 3	213	0.20
SP 4	210	0.22
SP 6	245	0.15
Tuapa	241	0.19
Namukulu	228	0.10
Hikutaivake	220	0.39
Toi	241	0.32
Mutalau	236	0.20
Lakepa	252	0.36
Liku	244	0.27
Hakupu	159	0.007
Vaiea	159	0.25
Avatele	149	0.41
Tamakautoga	172	0.09
Southern monitoring	396	0.20
Central monitoring	396	0.21
Toi North monitoring	235	0.36
Vaiea FB	151	0.44

bigeye tuna, and 1% increase for albacore (Ministry of Fisheries and Marine Resources 2018). Time series data from the Solomon Islands fleet shows no substantial increase or decline in tuna catch of the three main species over the period 2013–2017 (Figure 3.4). Historical data show a substantial increase in the Solomon Islands tuna catch in recent years, concurrent with a decline in catch using pole and line methods (Ministry of Fisheries and Marine Resources 2018; Figure 3.5). Figure 3.6 shows a substantial decline in yellowfin tuna and skipjack tuna catch in 2018.

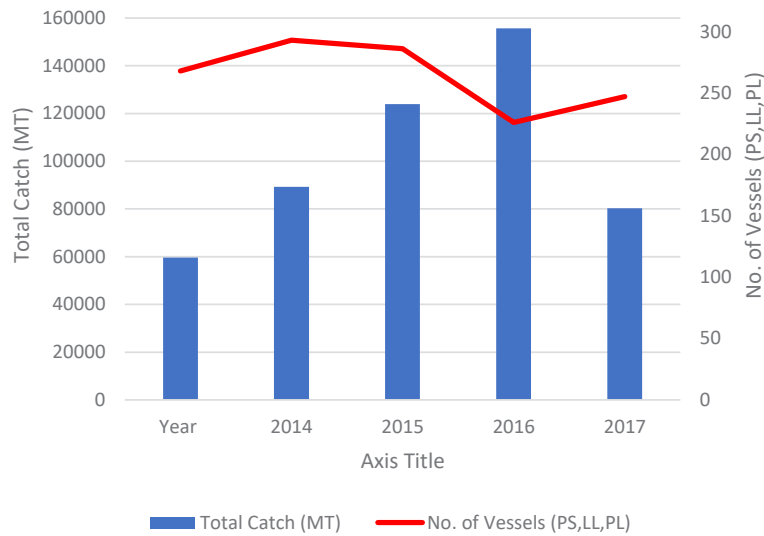
Despite the increasing catch levels of skipjack tuna in the Solomon Islands and elsewhere in the western Pacific, the Pacific Islands Forum Fisheries Agency (FFA) determined that the species is not overfished in a 2017 assessment (FFA, 2018). Further, skipjack tuna stocks are currently above the target reference point for an economically viable fishery (FFA, 2018). The 2017 albacore tuna fishery was also determined as not overfished, however FFA noted that the longevity of improved economic conditions seen in recent years were unlikely to continue without measures to control catch (FFA, 2018). The yellowfin tuna fishery was determined as not overfished, however there was considerable uncertainty around stock estimates which indicates this species may be approaching an overfished state (Figure 3.6; FFA, 2018). Finally, the bigeye tuna fishery was determined as not overfished, though again there is considerable uncertainty in this stock estimate and the WCPFC scientific committee recommends that fishing mortality is not increased from current levels (FFA, 2018). There are currently no agreed target reference points for economically viable albacore, yellowfin and bigeye tuna fisheries.



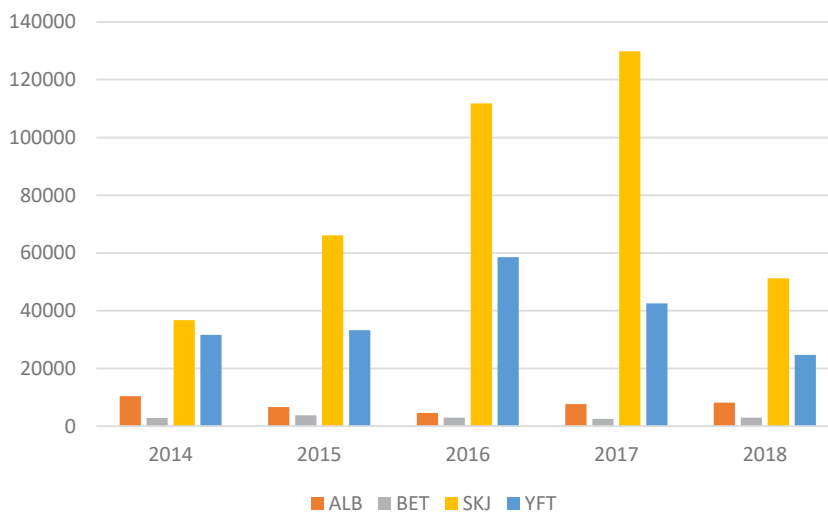
**FIGURE 3.3.** Total tuna catch by foreign licenced vessels in the Solomon Islands EEZ in 2017 (Ministry of Fisheries and Marine Resources 2018).



**FIGURE 3.4.** Annual purse seine and pole and line tuna catch for Solomon Islands national fleet 2013–2017 (Ministry of Fisheries and Marine Resources 2018). Data include discards.



**FIGURE 3.5.** Tuna catch for all gear types for 2014–2018 in the EEZ of Solomon Islands (Ministry of Fisheries and Marine Resources, Offshore Division, Statistics and Information System Section, 2019).



**FIGURE 3.6.** Tuna targeted species caught from 2014–2018: Albacore (ALB) – Bigeye (BET) – Skipjack (SKJ) – Yellowfin (YFT) (Ministry of Fisheries and Marine Resources, Offshore Division, Statistics and Information System Section, 2019).



## Impact

Overfishing can impact the state for offshore fishery by making fisheries economically unviable. These in turn result in economic losses in the fisheries sector, and threats to food security.

In relation to by-catch species, these too can be impacted by offshore fishing activity. The WCPFC reports that the regional objective for by-catch species such as sharks, turtles, marine mammals and seabirds is to significantly reduce capture. In longline fisheries the by-catch rate recorded by observers for sharks and turtles has decreased notably in recent years, which coincides with measures to reduce capture. Assessments at the regional level indicate concerns over the declining populations of several shark species including Silky shark and Oceanic Whitetip shark.

## Response and recommendations

Solomon Island works actively with the WCPFC to ensure that appropriate conservation and management measures are put in place to support sustainable harvest levels for migratory species in the region. Solomon Islands also complies with relevant measures relating to trade access and traceability of fisheries products.

At the national level, the Fisheries Management Act 2015, and its regulations, provide the basis for fisheries controls and their enforcement. Solomon Islands through the Ministry of Fisheries is currently reviewing its Tuna Management and Development Plan. Harvest strategy for

the key tuna species is ongoing and it is vital to consider the economic benefits, employment, catch and effort and the overall development of the domestic tuna fishery.

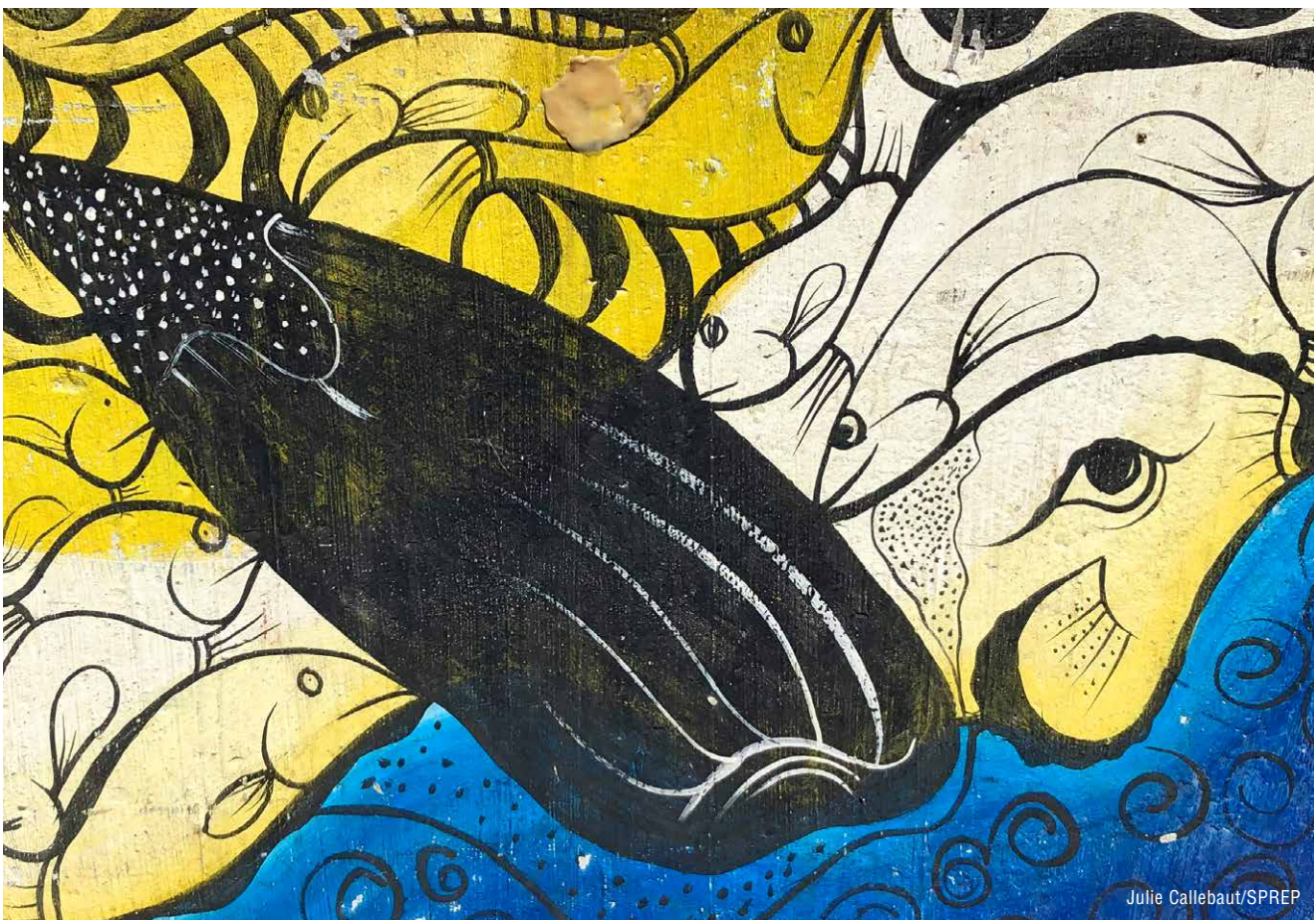
In 2015 the Solomon Islands Government hosted an inaugural National Oceans Summit that recognised the critical importance of the goods and services provided by coastal and marine ecosystems in the Solomon Islands. As a result, a process was put in place for developing a more broad-based approach to Oceans governance. This 'Ocean12' process has identified a set of priorities for Integrated Oceans Governance which are to form the basis for a National Oceans Policy.

In 2017 the European Union lifted its cautionary 'yellow card' on the Solomon Islands tuna industry. The promotion of status to 'green' was the result of the Solomon Islands government taking strong measures to combat illegal, unreported and unregulated (IUU) fishing in its waters, and has safeguarded this export fishery valued at SBD \$500 million per year.

## References

FFA (2018). Tuna Fishery Report Card 2018. Pacific Islands Forum Fisheries Agency, Honiara.

Ministry of Fisheries and Marine Resources, (2018). Annual Report to the Western and Central Pacific Fisheries Commission, Part 1: Information on Fisheries, Research and Statistics 2017. Solomon Islands Government, Honiara.



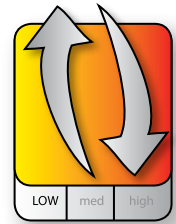
MARINE SPECIES OF SPECIAL INTEREST

Status of threatened, endemic, migratory or other species of concern. Population abundance of identified species and status of populations of priority species over time. Target: stable or increasing trend in population size. Population abundance estimate - can include actual population size, an index of abundance or area of occupancy.

Status and trend discussion

TURTLES

Marine turtles are recognised internationally as species of conservation concern. Table 3.1 gives an overview of marine turtle species occurring in the Solomon Islands, with respective IUCN Red List assessments and population trends. Past government surveys reported that nesting grounds for the three species Hawksbill, Green and Leatherback turtles are scattered throughout the country. Figure 3.7 shows the important turtle nesting sites in the Solomon Islands.



Status  
Fair to Poor

Trend  
Mixed

Data confidence  
Low

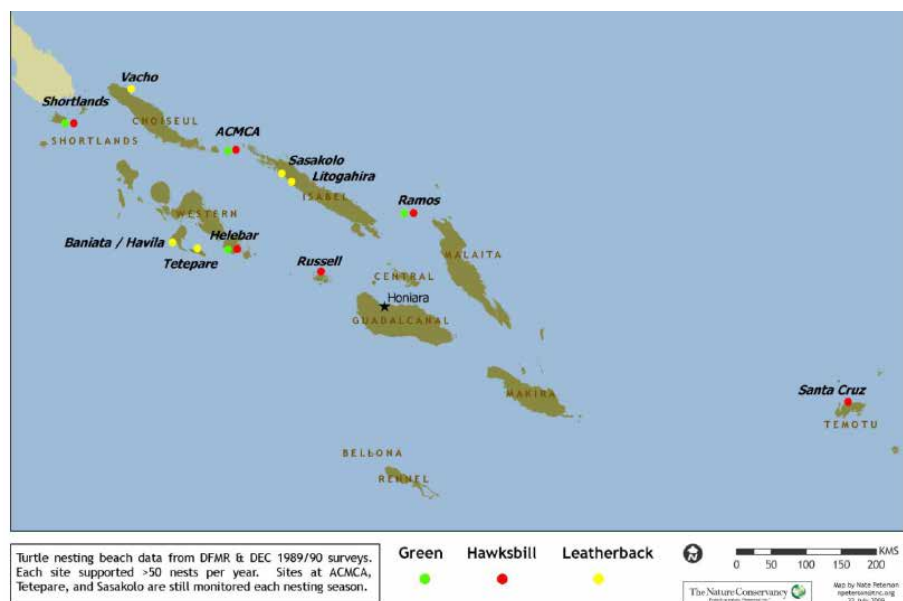


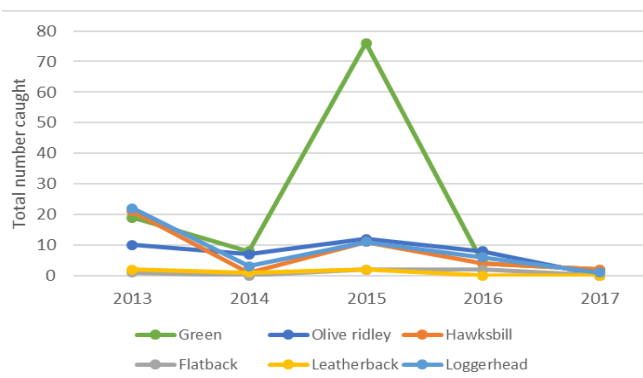
TABLE 3.1. Marine Turtle Species in the Solomon Islands.

Marine Turtle Species	Occurrence in Solomon Islands	IUCN Red List of Threatened Species 2011 (source 1)	IUCN Red List website (source 2)	Population trend	Last assessment	Scope of assessment
Leatherback <i>Dermochelys coriaces</i>	Common and nest in low densities (McKeown 1977; Vaughan, 1981)	Critically endangered	Vulnerable	Decreasing	21/6/13	Global
Hawksbill <i>Eretmochelys imbricata</i>		Critically endangered	Critically endangered	Decreasing	30/6/08	Global
Green <i>Chelonia mydas</i>		Endangered	Endangered	Decreasing	30/4/04	Global
Loggerhead <i>Caretta caretta</i>	Rare	Endangered	Vulnerable	Decreasing	23/8/15	Global
Olive Ridley <i>Lepidochelys olivacea</i>		Vulnerable	Vulnerable	Decreasing	30/6/08	Global

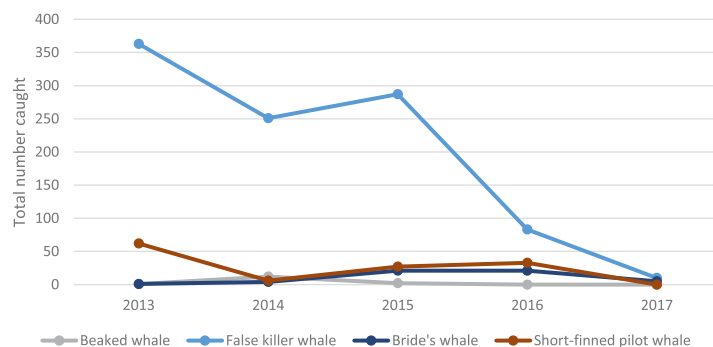
Source 1: Pacific Islands Regional Marine Species Programme 2013–2017; 2: <https://www.iucnredlist.org>, consulted on 06/02/2019

FIGURE 3.7. Important turtle nesting sites in the Solomon Islands (Review of Marine Turtles Legislation in Solomon Islands).

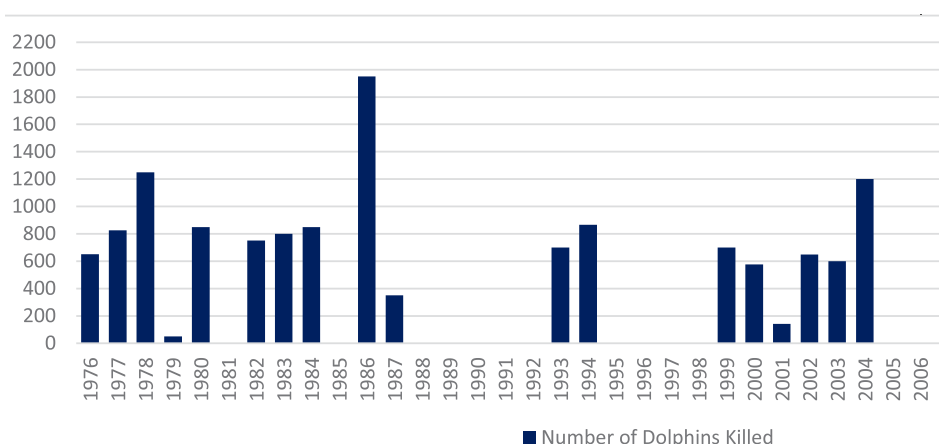




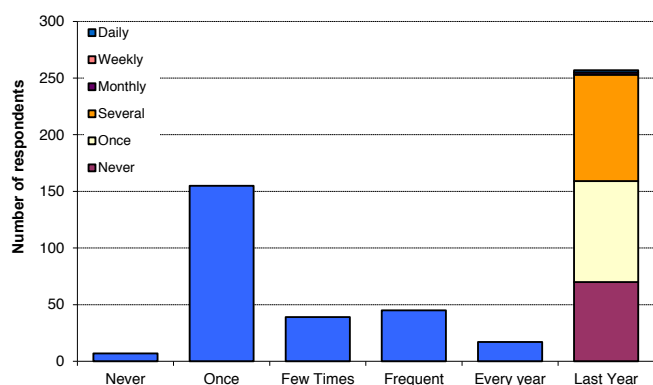
**FIGURE 3.8.** Observed annual estimated catches of turtles by the purse seine national fleet in the WCPFC Convention area for 2013–2017 (Solomon Islands Annual Report to the WCPFC).



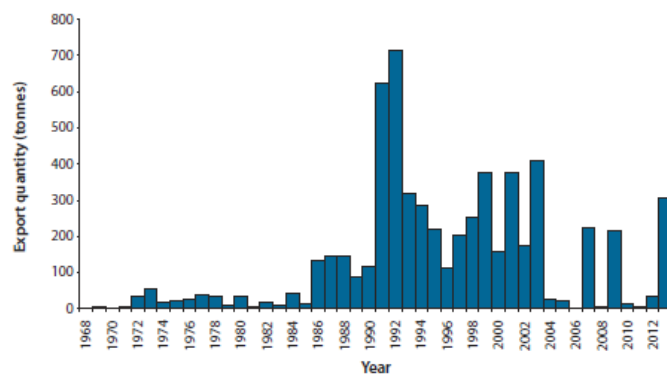
**FIGURE 3.9.** Observed annual estimated catches of selected whale species by the purse seine national fleet in the WCPFC Convention area for 2013–2017 (Solomon Islands Annual Report to the WCPFC).



**FIGURE 3.10.** Number of dolphins killed over time in drive hunts, in Fanalei Village, Solomon Islands.



**FIGURE 3.11.** Dugong Sighting Frequency - Automated analysis of the CMS survey data (Convention on the Conservation of Migratory Species of Wild Animals).



**FIGURE 3.12.** Beche-de-mer export quantities in tonnes in the Solomon Islands, 1968–2013. Table 3.2 shows more recent data for 2017 and 2018.

**TABLE 3.2.** Beche-de-mer exports from Solomon Islands 2017–2018 (MCM data)

Year	No. shipments	Invoice value (SBD)	Net weight (ton)	No. packages
2017	14	12,040,931	200,507	2095
2018	14	6,120,012	91,117	1336

Marine turtles have for centuries played important roles in the lives of Solomon Islanders. Marine turtles still remain an integral part of socio-cultural life of the coastal communities. Turtle meat and eggs are used as a delicacy during special occasions, while the shells and oil are used for cultural and traditional purposes (Review of Marine Turtles Legislation in Solomon Islands). Marine turtles are harvested for traditional use throughout the Solomon Islands, however some illegal trade of turtles is occurring.

Annual estimated catches of turtles by the purse seine national fleet in the WCPFC area show a stable or declining trend for most turtle species from 2013 to 2017 (see Figure 3.8). A significant peak in catches of green turtles can be observed in 2015.

The numbers are for the entire WCPFC area, as specific numbers for Solomon Island waters are unavailable.

## WHALES

The SoE report 2008 mentions eight species of whale found in Solomon Island waters: Bryde's Whale (*Balaenoptera edeni*) which has been recognised as a distinct dwarf stock endemic to the waters surrounding Solomon Islands, the Short-finned Pilot whale (*Globicephala macrorhynchus*), Melon-headed Whales (*Peponocephala electra*), Orca or killer whale (*Orcinus orca*), Beaked whale (*Mesoplodon sp.*), Rorqual baleen whale (*Balaenoptera sp.* – either the common Bryde's or Sei whale; *B. brydei* or *B. borealis*), Sperm whale (*Physeter macrocephalus*) and Humpback whale (*Megaptera novaeangliae*).

The Pacific Islands Regional Marine Species Programme 2013–2017 mentions two additional whale species for the Solomon Islands: Blue whales and False killer whales.

On the IUCN Red List, most whale species are listed as “Least concern” or no sufficient data is available for the assessment (“Data deficient”). Blue whales are listed as “Endangered”, False killer whales as “Near threatened” and Sperm whales as “Vulnerable” in the global assessments.

Annual estimated catches of whales by the purse seine national fleet in the WCPFC area show a decline in the catch of False killer whales from 2013 to 2017 (see Figure 3.9). Numbers of catches for the other relevant whale species in the Solomon Islands remain more or less stable or show a relatively small decline. The numbers are for the entire WCPFC area, as specific numbers for Solomon Island waters are unavailable.

## DOLPHINS

The SoE report 2008 reports on the following dolphin species in Solomon Islands waters: Spinner dolphin (*Stenella longirostris*), Pantropical spotted dolphin (*Stenella attenuata*), Bottlenose dolphin (*Tursiops truncatus*), Risso's dolphin (*Grampus griseus*), Rough-toothed dolphin (*Steno bredanensis*) and single sightings for the Indo-Pacific bottlenose dolphin (*Tursiops aduncus*). The Pacific Islands Regional Marine Species Programme 2013–2017 mentions

three additional species (Fraser's dolphin, Snubfin dolphin and Striped dolphin).

The Solomon Islands has a long history of exploiting dolphins through traditional drive-hunts, in particular at the island of Malaita. Only a few villages have specialised in dolphin hunts, but they probably caught up to several thousands of individuals in some years (Oremus et al. 2015). Figure 3.10 shows the number of dolphins killed over time in drive hunts, in Fanalei Village, Solomon Islands.

This graph illustrates the high number of individual dolphins that can be killed per year, by just one community.

Accurate records for the 2013 hunts show that three species were caught. The largest catches were the pantropical spotted dolphins with over 1,500 individuals killed in seven hunting events (ranging 54 to 700+ per event). The other two species were the spinner dolphin (159 killed in three events) and, presumably, the common bottlenose dolphin (15 killed in one event). Such levels of removals raise concerns for depletion of local populations, in particular for the pantropical spotted dolphin.

A 2013 survey assessed dolphin populations for the purpose of advising on sustainable removal rates, especially in relation to the dolphin export industry (Oremus et al. 2015 a). The survey report made several recommendations, including:

- Set future species-specific quotas based on captures rather than the number of export, because the last does not account for mortality during local captivity.

- Impose a complete capture ban on the Guadalcanal population until future monitoring shows an increase in abundance.

- Establish a ‘DNA register’ for individual identification of all dolphins taken for trade, including those now held overseas.

## DUGONG

The dugong (*Dugong dugong*) is the only herbivorous mammal that is strictly marine, and the only extant species in the family Dugongidae. It is listed as vulnerable to extinction at a global scale by the International Union for Conservation of Nature (IUCN), with a decreasing population trend.

There is no current information available on the status of dugong populations and little information on the distribution and abundance of dugongs, their movement between the islands and extent of suitable seagrass habitat. Information on the dugong population in the Solomon Islands is largely based on two assessments consisting of interviews with local coastal communities conducted in 2009 and 2010. There is limited information regarding the levels of direct take. In the 2009 survey of six provinces, the highest number of dugong sightings occurred in north-east Choiseul, Honiara bay, northern Malaita, and Marovo Lagoon and the Samasodu coast of Isabel Province and Western Province (The Dugong and Seagrass Conservation Project).

In 2017 and 2018, 297 perspective surveys using the standardised Convention on the Conservation of Migratory

Species of Wild Animals (CMS) Dugong MOU Standardised Catch and Bycatch Questionnaire were conducted across six provinces (Figure 3.11). The survey aimed to obtain baseline information on the distribution and abundance of dugong populations and help identify and map areas of important dugong habitat such as seagrass beds. In obtaining community perspectives, respondents (n=263) were asked the frequency of dugong sightings in general and in the last year. The majority of respondents (58.9%) stated that they had seen dugongs once, and 35.7% of respondents had seen dugongs several times in the past year.

Whilst this provides the most recent baseline picture to dugong presence in Solomon Islands waters there are limitations to the CMS survey dataset. The key limitation was that the majority (68.7%) of the survey results were from Western Province. Key dugong hotspots remain unknown for other provinces.

On 27 August 2018 the Fisheries Management (Prohibited Activities) Regulations 2018 were officially gazetted, making dugongs, prohibited to hunt throughout the Solomon Islands.

### BECHE-DE-MER/SEA CUCUMBER

Based on commercial export records, 31 commercial species of sea cucumbers have been exploited in Solomon Islands (Kalo et al. 2014). The following nine sea cucumber species present in Solomon Islands are listed on the IUCN Red List: golden sandfish, sandfish, black teatfish, prickly redfish are endangered with extinction, and curryfish, white teatfish, deepwater redfish, surf redfish and hairy blackfish are vulnerable to extinction.

The sea cucumber fishery is a multi-million-dollar industry in the Solomon Islands. The fishery provides an important source of income for rural communities, and foreign exchange revenue for the country (Fig 3.12; Table 3.2). However, persistent fishing pressure and ineffective management has led to the over-exploitation of this resource, which has placed the fishery in danger of collapse.

The decision to suspend fishing efforts in 2005 was timely although the lifting of the ban in 2007 on humanitarian grounds (to assist disaster victims in the western part of the country) has weakened the ban's effectiveness. Allowing some communities to continue harvesting sea cucumbers while closing the fishery to the rest of the country has created a certain amount of distrust of the ban, this has resulted in fishing efforts shifting to other provinces and illegal fishing activities after the ban was reinstated in April 2009 (Kalo et al. 2014).

Sea cucumber production in Solomon Islands has been declining since the 1990s when production levels were high. Persistent fishing pressure and the demand for products has been a challenge for the management authority. Increasing market demand in China has increased product prices in recent years. The total export

value for 2013 was the highest ever recorded for Solomon Islands at over SBD 33 million, which is a 70% increase in total export value over SBD 10 million in 1992. High commodity prices reflect the shortage of product, which is a result of resource overexploitation. Low-value products now dominate production because high-value products have been depleted.

As at 2017 the Central Bank of the Solomon Islands directly administers the export of beche-de-mer in collaboration with the Ministry of Fisheries and Marine Resources. This means that export of beche-de-mer requires 'Specific Authority' CBSI, after receiving market price certification clearance from the Director of Fisheries. The CBSI has reported that in 2017 it approved 16 applications for Specific Authorities to export beche-de-mer. The total weight of the product exported was 219,343 kilograms valued at SBD13.1 million.

### SHARKS AND RAYS

Fifty sharks and rays were identified from the Solomon Islands, of which 20 are assessed as Vulnerable or Endangered on the IUCN Red List, 10 in the Convention on International Trade in Endangered Species, and 11 in the Convention for Migratory Species.

Fishing appears to be the main impact, though impacts from habitat loss and degradation are possible.

The state of knowledge about shark and ray populations in the Solomon Islands is poor and comprehensive scientific surveys to document shark and ray diversity and population trends have not been completed. Limited information is available and a complete assessment of shark and ray status in the Solomon Islands will require primary fieldwork (S. Hylton et al. 2017).

### Impact

These marine species have been identified in Solomon Islands and internationally as having special cultural, environmental or economic value, while also being vulnerable to pressures from development, pollution, habitat loss and harvest practices. The impacts of additional decrease in populations, include ecosystem effects, local scarcity or extinction, and loss of income/livelihoods.

### Response and recommendations

The main challenges to effective conservation of marine species of special interest in the Solomon Islands include the lack of data on populations, harvesting level and interactions with fishing activities due to limited research and monitoring. A major constraint is limited resources, both financially and in terms of manpower (including skills) available for implementing management actions. Marine protected areas also have a role, especially in relation to spawning ground and sedentary species such as sea cucumber.



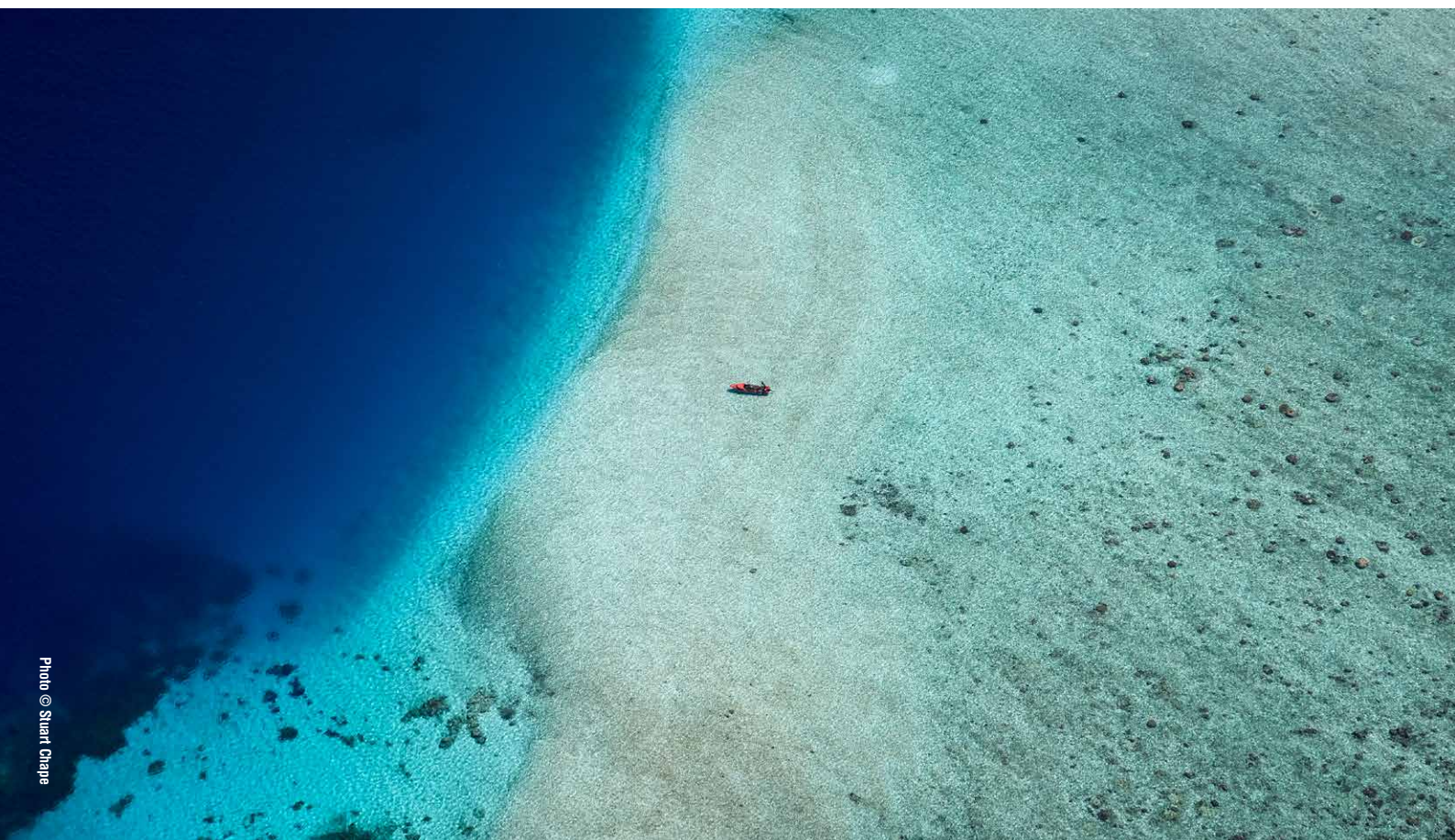
The government's response involves a suite of measures, primarily under the Fisheries Act, which allows the imposition of special control in relation to particular species or stocks.

Under the Fisheries Management Act 2015 (No. 2 of 2015) and Fisheries Management Regulations 2017, certain species used for traditional activities or purposes are exempted from the act, for example dolphin catches are allowed for traditional purposes. Nevertheless, efforts need to be made to ensure the traditional hunting is sustainable, which will require monitoring of catches. The range of cultural practices, values and knowledge associated with certain marine species needs to be documented and a more cohesive approach in policies and legislation needs to be encouraged.

The Pacific Islands Regional Marine Species Programme 2013–2017, contains detailed Action Plans for marine turtles, whales and dolphins and dugongs. Please refer to the full document for main objectives per species, specific actions, priorities and indicators.

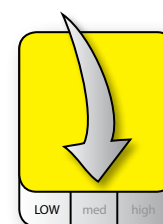
## References

- Ministry of Fisheries and Marine Resources (2018). Annual Report to the Western and Central Pacific Fisheries Commission, Part 1: Information on Fisheries, Research and Statistics 2017. Solomon Islands Government, Honiara.
- Hylton, S., White, W.T., and Chin, A. (2017). The sharks and rays of the Solomon Islands: a synthesis of their biological diversity, values and conservation status. *Pacific Conservation Biology* 23, 324–334.
- SPREP (2012). Pacific Islands Regional Marine Species Programme 2013–2017. Apia, Samoa: SPREP.
- Masolo, T., and Ramohia, P. (2016). Review of Marine Turtles Legislation in Solomon Islands. SPREP, Honiara.
- SPREP (2008). Regional Marine Turtle Action Plan 2008–2012. SPREP, Apia.
- MECDM (2008). Solomon Islands State of Environment Report 2008. MECDM, Honiara.
- Oremus, M., Leqata J., and Baker, C.S. (2015). Resumption of traditional drive hunting of dolphins in the Solomon Islands in 2013. *Royal Society Open Science* 2, 140524.
- Pakoa, K., Masu, R., Teri, M., Legata, J., Tua, P., Fisk, D., and Bertram, I., (2014). Solomon Islands sea cucumber resource status and recommendations for management. Secretariat of the Pacific Community (SPC), Noumea, New Caledonia.
- "The Dugong and Seagrass Conservation Project" by GEF, UNEP, Mohamed bin Zayed Species Conservation Fund, Dugong MoU. <http://www.dugongconservation.org/>
- Automated analysis of the CMS survey data (Convention on the Conservation of Migratory Species of Wild Animals).



## SEAGRASS, MANGROVE AND CORAL REEF ECOSYSTEMS

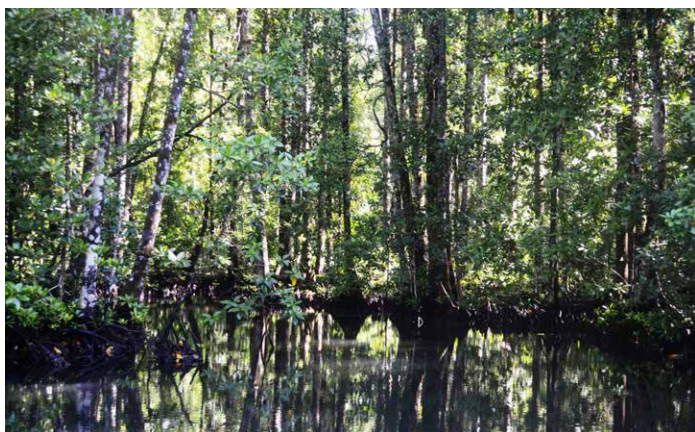
Seagrass, mangrove and coral reef ecosystems perform important ecosystem services and support high levels of biodiversity. Ideally, these ecosystems are monitored by recording percentage cover over time and a target trend is stable or increasing.



**Status**  
Fair

**Trend**  
Deteriorating

**Data confidence**  
Low



**FIGURE 3.13.** Mangroves at Kakaza, Choiseul province.



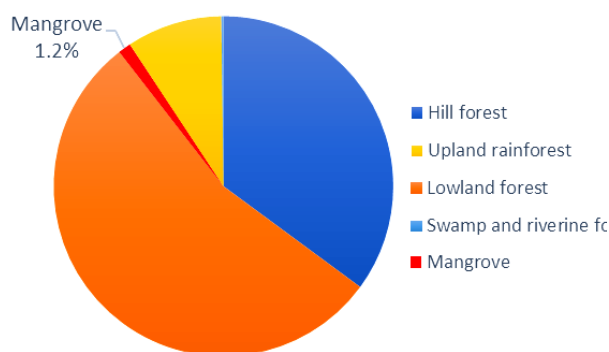
**FIGURE 3.14.** Large area of mangrove damage by log pond development, Russell Islands, Central province (©Edward Danitofea, MECDM).



### Status and trend discussion

Mangrove forests provide a range of ecosystem services for the people of the Solomon Islands, including: coastline protection, water filtration, nursery grounds for fish, timber harvest, and fisheries production (Albert and Schwarz 2013; Figure 3.13). In the Solomon Islands there are at least 29 confirmed species or 45 % of the world’s mangrove species (Albert and Schwarz 2013). In 2000 mangroves covered an area of about 47,000 ha or almost 2% of the Solomon Islands total land area, this was the third highest area of mangrove cover among the Pacific Islands (behind PNG and Fiji; Bhattarai and Giri 2011). Mangrove forests in the Solomon Islands have declined by at least 27% since the 1970s (Hansell and Wall 1976; Figure 3.14). There have been no recent fine-scale assessments of mangrove area in the Solomon Islands to determine any changes in area since 2000, though a coarse-scale estimate of 31,200 ha was calculated for 2016 (Ago and Luda 2018; Figure 3.15).

Seagrass meadows provide food and shelter for diverse organisms, are a nursery ground for fish and invertebrates of commercial and artisanal fisheries importance, are substantial carbon dioxide sinks and oxygen producers, and have important roles in nutrient trapping and recycling (Green et al. 2006). Seagrass is also food for the threatened green sea turtle and dugong which are found throughout the Solomon Islands, and used by communities for food and ceremony (Green et al. 2006). An extensive seagrass survey of the Solomon Islands was conducted in 2004 which located 10 species of seagrass, 80% of species known from



**FIGURE 3.15.** Mangroves as a proportion of total area of natural forests in the Solomon Islands (Forest and Land Use Change 2000–2016). Derived from 2km grid using Collect Earth.

the Indo-Pacific region (Green et al. 2006). A total 1446 ha of seagrass meadows were mapped during the surveys, but the total area of seagrass remains unknown and these survey sites have not been revisited to measure any changes over time (Green et al. 2006). Seagrass meadows were determined to be in relatively healthy condition compared to many other regions globally (Green et al. 2006). High sedimentation/turbidity in coastal waters, primarily the result of logging activities, was identified as a major threat at some locations (Green et al. 2006). Other impacts were similarly localised and included soil erosion related to coastal agriculture (coconut plantations), sewage discharge (human and agriculture), industrial pollution, port/village infrastructure/dwellings and overfishing (Green et al. 2006).

Extensive coral reef surveys were conducted in the Solomon Islands in 2004 across 113 sites around the major islands and a total of 485 described species belonging to 76 genera were recorded (Green et al. 2006). This is the second highest species diversity in the world, second only to the region of the Raja Ampat Islands of eastern Indonesia (Green et al. 2006). Seven coral community types were recognised and those found in very sheltered inlets were of particular interest as they had high species richness, usually high living coral cover (32% average live coral cover) and were generally in good health (Green et al. 2006). Overall, reefs and coral communities of the Solomons were in good condition and, with the exception of some localised areas, impacts and reef degradation were low to moderate at most sites (Green et al. 2006). Crown of thorns starfish damage was the most widespread threat and significant at some locations (Green et al. 2006). Damage from the 2000 coral bleaching event was noted at some locations however sediment-associated impact was rare (Green et al. 2006). There was evidence of over harvesting of commercially targeted reef species, such as giant clams, *Trochus* and sea cucumbers (Green et al. 2006). Lau'alo Passage (northeast Malaita) with its extensive shallow reef areas and reticulate channels, seagrass meadows and artificial reef island villages, is an area of great ecological and cultural value, and potential conservation interest (Green et al. 2006). There are currently no monitoring programmes in place to assess the recent or current status of Solomon Islands coral reefs.

## Impact

Mangroves and seagrass are of special interest to coastal fisheries worldwide because of the role they play in providing nursery areas for commonly harvested fish and invertebrates. In addition to their roles as nursery areas, mangroves, seagrasses and intertidal flats provide feeding habitats for any species of adult demersal fish, some of which reside on reefs during the day and forage over seagrasses and intertidal flats at night. Seagrasses and intertidal flats are also permanent habitats for several species of sea cucumbers, the main group of invertebrates targeted as an export commodity in the region, and for a wide range of molluscs gleaned for subsistence. Overall, the range of coastal fisheries resources that depend on

mangroves, seagrasses and intertidal flats is extensive, with many of these species important to the food security and livelihoods of coastal communities in Pacific island countries and territories (Waycott et al. 2011).

Coral reefs are unique ecosystems that also provide habitats for other species (fish, turtle, dugong) as well as having other benefits such as providing protection/resilience against wave action, and supporting tourism. Each of these habitats are vulnerable to pollution, loss of water quality and sedimentation from land-based activities. They are also vulnerable to changes in sea temperature and pH, as well as extreme weather events, associated with climate change.

## Response and recommendations

### MANGROVES

- Strengthening development consent process including loss of habitat and secondary impacts
- Valuation, ecosystems services etc
- Community participation in mangrove protection
- Education around overharvest
- Protected and managed areas – KBA's blue carbon concepts
- MPAs, LMAs and *tabu* areas

### SEAGRASS

- Dugong conservation strategy
- Seagrass conservation and management strategy
- MPAs, LMAs and *tabu* areas

### CORAL REEFS

- Draft Coral Management plan on harvesting
- Require coral reef management plan
- As per mangrove and seagrass above
- MPAs, LMAs and *tabu* areas
- Coral triangle initiative on coral reefs, fisheries and food security

## References

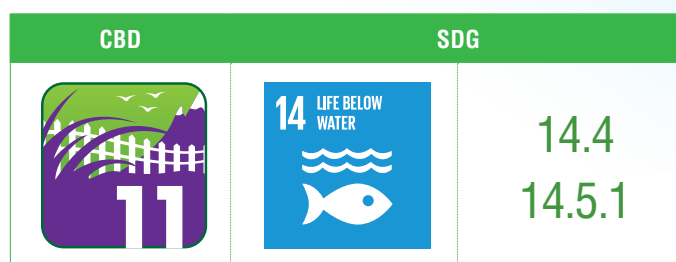
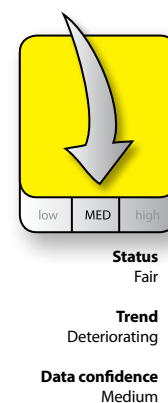
- Ago, K. and Luda, O. 2016. The Forest and land use composition of the Solomon Islands study in 2016.
- Albert, J.A. and Schwarz, A.J. 2013. Mangrove management in Solomon Islands: Case studies from Malaita Province. CGIAR Research Program on Aquatic Agricultural Systems. Penang, Malaysia. Policy Brief: AAS-2013-14.
- Bhattarai, B. and Giri, C.P. 2011. Assessment of mangrove forests in the Pacific region using Landsat imagery. *Journal of Applied Remote Sensing*, 5(1), p.053509.
- Green, A., P. Lokani, W. Atu, P. Ramohia, P. Thomas and J. Almany (eds.) 2006. Solomon Islands Marine Assessment: Technical report of survey conducted May 13 to June 17, 2004. TNC Pacific Island Countries Report No. 1/06.
- Hansell, JRF. and Wall, JRD. (1976). Land resources of the Solomon Islands. In Vol 1, Introduction and recommendations. Land Resources Study 18, Land Resources Division, Ministry of Overseas Development, London.

MARINE PROTECTED AREAS

Area in Marine Protected Areas and Marine Protected Areas.

DEFINITIONS – STATUS OF PROTECTED AREAS:

- **Proposed:** in a process to gain recognition or dedication through legal or other effective means.
- **Designated:** recognised or dedicated through legal means, implies specific binding commitment to conservation in the long term.
- **Established:** recognised or dedicated through other effective means. Implies commitment to conservation outcomes in the long term, but not necessarily with legal recognition.



Status and trend discussion

Solomon Islands has an ocean space of 1.64 million km<sup>2</sup>. Most of the coastal management is done by customary practices (including *tabu*). Locally managed marine areas and community-based management approaches. NGOs and CBOs support the establishment and management of community-based management programmes in partnership with communities. No offshore protected areas exist.

As of 2009 there were 127 Marine Protected Areas in the Solomon Islands (Table 3.3; Figure 3.16; Govan et al. 2009). 113 of these were considered ‘active’ of which 109 were Community Conservation Areas (CCAs) and the other four co-managed with strong community involvement

**TABLE 3.3.** Area and number of marine protected areas in the Solomon Islands, 2009 (Govan et al. 2009).

Marine protected areas (MPAs)	Area (Km <sup>2</sup> )	Total count
MPAs (active)		127 (113)
Community conservation areas		109
No take-zones or <i>tabu</i>		115
MPA coverage	1380.9	111
Area of no-take zones (NTZ)	310.5	95
Average NTZ	3.3	95
Median NTZ	0.5	95
Max NTZ	157.8	95
Min NTZ	0.001	95

(Govan et al. 2009). A feature of 37 of the 109 CCAs is that no-take zones are rotational or periodic closures (Govan et al. 2009). For 40 of the CCAs there are permanent harvest closure and the status of the remainder was unknown (Govan et al. 2009). It is expected that for many CCAs *tabu* may be opened for harvest occasionally (Govan et al. 2009). The Arnarvons Community Marine Conservation Area is the largest marine protected area in the Solomon Islands (157.8 km<sup>2</sup>), making up almost half of the total marine no-take area (Govan et al. 2009).

In 2017, SIG identified 65 Special Unique Marine Areas (12 offshore and 53 inshore) that can form the basis of a development Marine Spatial plan and in turn support Government to identify marine protected areas within its EEZ.

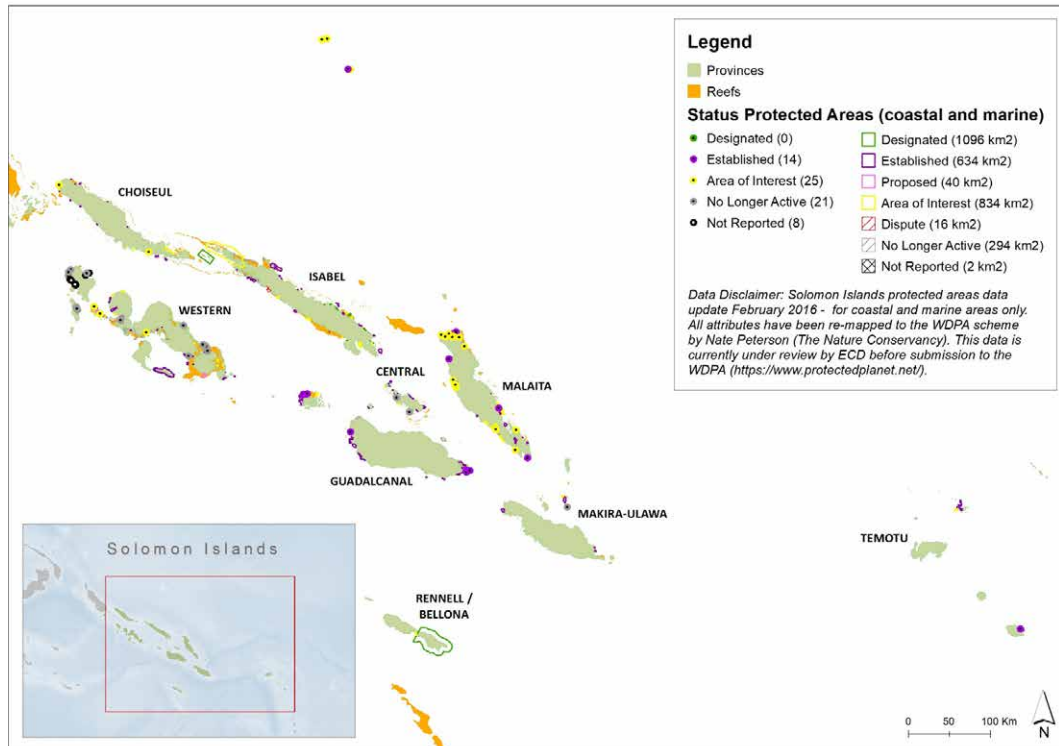
Impact

Conservation areas protect sensitive resources and create a sanctuary for species. Communities benefit from these areas through increased resources for subsistence and commercial activities, ecosystem services, and enhanced tourism values and recreational activities (Figure 3.17).

Response and recommendations

The government’s response involves a suite of measures, primarily under the Fisheries Act (in relation to fishing) and the Protected Areas Act, which enables the establishment of marine protected areas. A marine spatial plan is currently in development. Specific recommendations:

- Support coastal protection and the Fisheries and Protected Areas Acts
- Complete and implement marine spatial plan.



**FIGURE 3.16.** Location of coastal and marine protected areas in Solomon Islands (status 2016).



**FIGURE 3.17.** The coral reefs of the Solomon Islands are among the most diverse on earth. Seaweed farming at Wagina, Choiseul Province (©ECD).

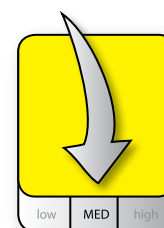
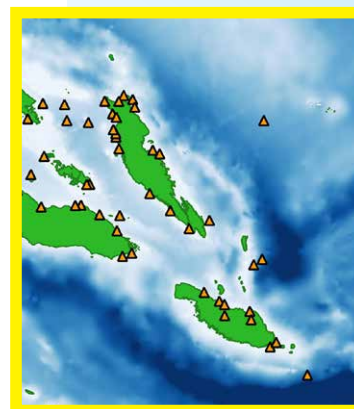
### References

Govan, H. et al. (2009). Status and potential of locally managed marine areas in the South Pacific: meeting nature conservation and sustainable livelihood targets through wide-spread implementation of LMMAs. SPREP/WWF/ WorldFish-Reefbase/CRISP.



COASTAL FISHERIES

Inshore reef fishery – this indicator reports on fish catch data as a measure of reef system and coastal fishery health.



Status  
Fair

Trend  
Deteriorating

Data confidence  
Medium



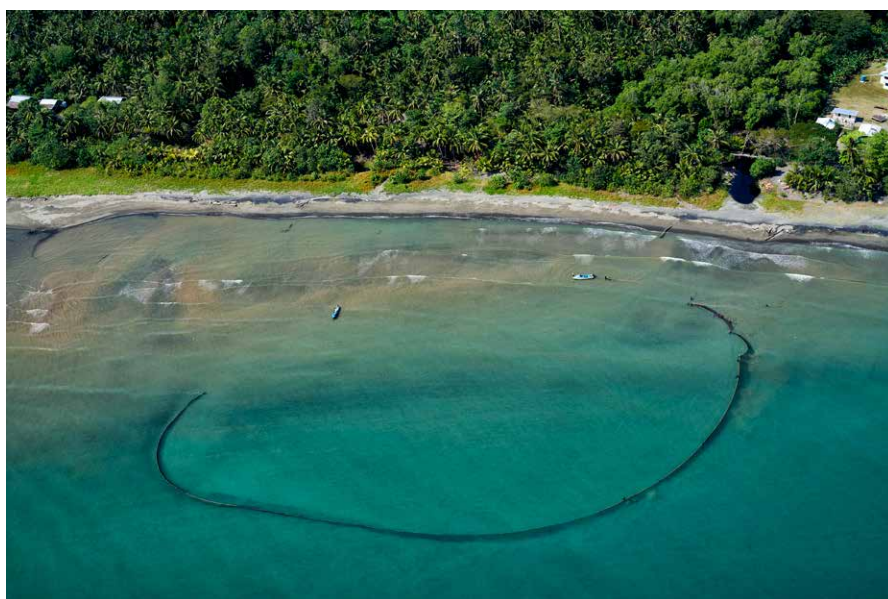
**TABLE 3.4.** Total seaweed export figures and earnings for 2016–2018.

Seaweed	2016	2017	2018
Volume (Kg)	802,160	538,780	403,186
Value (SI\$)	4,010,800	2,693,900	2,015,929

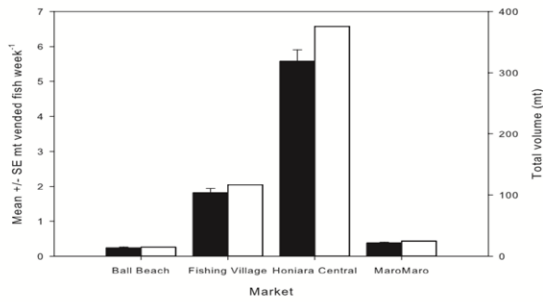
Mariculture - seaweed sites 2019: Wagina (450 Farmers); Manaoba (40 Farmers); Marau (26 Farmers); Rarumana (12 Farmers); Nifiloli (6 Farmers).

Status and trend discussion

Fish, including shellfish and other inshore marine resources, play a vital role in both food security and income generation in Solomon Islands (State of the Coral Triangle: Solomon Islands Report; Table 3.4). The 2012/13 HIES reported 48.4% of households involved in subsistence activities related to fishing. Fishing is largely a male dominated activity – 90% of rural men reported to be engaged in fishing compared to about half of women (Gender analysis of the fisheries sector - Solomon Islands, 2018; Figure 3.18).

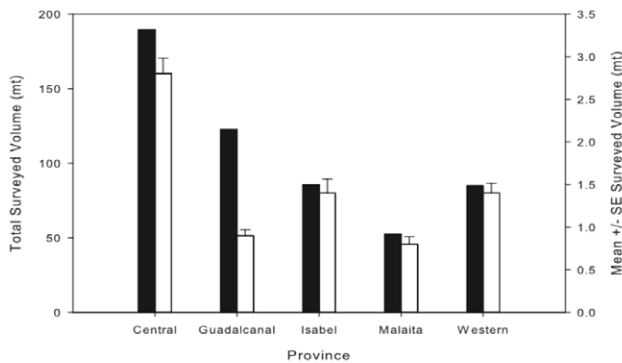


**FIGURE 3.18.** Fish drive on Tenaru Beach, Guadalcanal. © Stuart Chape.



**Fig. 5:** Market-specific mean ( $\pm$ Standard deviation) metric tons of fish vended per week (white bars) and total volumes (black bars) marketed, based on mobile platform data taken in 2013-2015.

**FIGURE 3.19.** Market-specific mean ( $\pm$ standard deviation) metric tons of fish vended per week (white bars) and total volumes (black bars) recorded in Honiara fish markets 2013–2015.



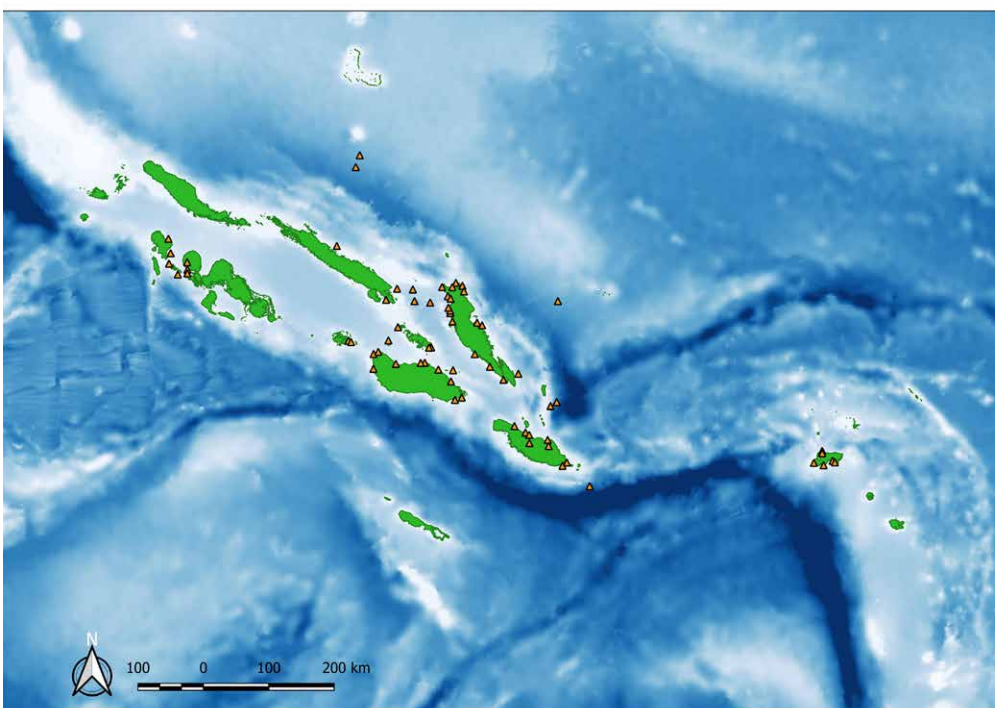
**FIGURE 3.20.** Provincial total biomass of fish (black bars) and mean ( $\pm$ standard error) surveyed volumes (white bars) recorded in Honiara fish markets 2013–2015 (Rhodes and Tua 2016).

Fish typically supplies 50–90% of dietary animal protein for coastal communities in Pacific island countries and territories (Bell et al. 2009). Bell reported annual fish consumption per capita as 33 kg/capita/year, with a higher intake in the urban population compared to the rural, and a higher intake in coastal communities compared to those in the inland areas.

The figures may be underestimates (Weeratunge et al. 2011), as a survey performed by Pinca et al. (2009) that included four separate locations estimated annual per capita fish consumption at 98.6 kg–110.9 kg (State of CT: SI report)

Men and women participate differently in their fishing activities, often shaped by gender norms and relations that determine socially acceptable activities. Men tend to participate more in reef and off-shore fishing, while women often participate in inshore environments, including lagoons and mangrove areas (Govan et al. 2013; Kruijssen et al. 2013). Men use more fishing methods, such as lines and spears, whilst women mainly glean for invertebrates and harvest mangrove products (Weeratunge et al. 2011, Gender analysis of the fisheries sector - Solomon Islands. 2018).

Between 2015 and 2016 the Solomon Islands Ministry of Fisheries and Marine Resources (MFMR) conducted an assessment of Honiara and Gizo inshore fisheries markets (Rhodes and Tua 2016; Rhodes and Tua 2017). The objectives of the programme were to: (1) provide a baseline assessment of the fishery for future comparison, and (2) to document the individual fish species entering the commercial markets. These assessments included small-scale, roadside (e.g. Maromaro, Fishing Village) and large-scale (e.g. Honiara Central) markets (Rhodes and Tua 2016; Rhodes and Tua 2017). Phase I results



**FIGURE 3.21.** Location of the 73 Fish Aggregating Devices (FADs) deployed in the Solomon Islands, status 2019 (Ministry of Fisheries and Marine Resources).

identified variations in resource origin and provided useful information on vended volumes of fish. Central Province was identified as the largest supplier of inshore fisheries resources (Figures 3.19, 3.20; Rhodes and Tua 2016). At the termination of Phase II, over 78,000 individual fish photos had been taken from a total of 147 vendors. From these combined data, the project revealed that at least 379 individual species from 48 fish families were represented in inshore catch (Rhodes and Tua 2016; Rhodes and Tua 2017). Twelve families were represented by more than 10 species, while more than 40 individual species for snappers (Lutjanidae) and groupers (Epinephelidae), respectively, were present. At the provincial level, the catch from Western Province was represented by the most species (314 species), followed closely by Central Province (299 species) (Rhodes and Tua 2016). Size distributions for most species conformed to expectations, however a substantial contribution to catch for most commercially important species was from juveniles. Only one major species (Whitespotted spinefoot *Siganus canaliculatus*) had catch comprised of 100% mature individuals (Rhodes and Tua 2016; Rhodes and Tua 2017). In contrast, most individuals of the Green humphead parrotfish *Bolbometopon muricatum* were below the size of sexual maturity. A few other major target species, including Two-spot red snapper (*Lutjanus bohar*), Bluefin trevally (*Caranx melampygus*), Humpnose big-eye bream (*Monotaxis grandoculis*), Pacific longnose parrotfish (*Hipposcarus longiceps*), Ember parrotfish (*Scarus rubroviolaceus*), and Yellowfin goatfish (*Mulloidichthys vaniocolensis*) had substantial portions of juveniles in catch, which may be cause for concern (Rhodes and Tua 2016; Rhodes and Tua 2017). These findings represent the first descriptive account of the Honiara commercial finfishery. It is expected that MFMR will now be able to identify tangible goals for market-based fisheries management. The market survey programme identified the importance of working closely with market owners, fishers and vendors to build trust and communication (Rhodes and Tua 2016). While management needs are being identified, awareness raising and support from MFMR to fishers and vendors may provide a means to institute voluntary compliance and sales principles and reduce the need for direct management approaches.

## Impact

Reef fish are an important food source for the people of the Solomon Islands. Market surveys indicate that most of the frequently targeted fish species are being overfished. Several actions must be implemented to ensure that reef fish harvest is sustainable.

## Response and recommendations

- Implement sales or import restrictions on vulnerable and iconic species (e.g. Humphead wrasse *Cheilinus undulatus*) and species important to ecosystem maintenance (e.g. Green humphead parrotfish, *Bolbometopon muricatum* and coastal sharks and rays).
- Implement size limits for overfished species (e.g. Bluefin trevally *Caranx melampygus*; Two-spot red snapper, *Lutjanus bohar*).
- Repeat baseline market surveys at 5–10 year intervals to allow for a comparative assessment of the fishery and an establishment of trends in the fishery.
- Implement a temporal restriction on sales during known spawning times for important species, such as coral trout/coral grouper (e.g. Squaretail coral grouper *Plectropomus areolatus*) and other species that aggregate to spawn (e.g. Camouflage grouper *Epinephelus polyphekadion*).
- Continue to deploy new FADs to reduce pressure on coral reef maintenance (Figure 3.21).
- Establish representative monitoring programme for reef fish.
- Enforcement of regulations under Fisheries Act, including establishing an inshore fisheries compliance division.
- Establishment of community-based resource management (CBRM) with capacity building in sustainable fishing and management.
- Increased attention on inshore, e.g. MSG inshore roadmap, SPC new song strategy.
- Encourage research on coastal fisheries status and monitoring.

## References

- Rhodes K.L., and Tua, P.J. (2016). Preliminary Report on Inshore Fisheries Resources Marketed in Honiara, Solomon Islands. A Report to the Solomon Islands Ministry of Fisheries and Marine Resources, 25 December 2016.
- Rhodes K.L., and Tua, P.J. (2017). Report on Inshore Fisheries Resources Marketed in Gizo, Western Province, Solomon Islands. A Report to the Solomon Islands Ministry of Fisheries and Marine Resources, 17 March 2017.
- State of the Coral Triangle: Solomon Islands Report. 2012/13 HIES.
- Gender analysis of the fisheries sector - Solomon Islands. 2018.
- Bell et al. 2009.
- Weeratunge et al. 2011.
- Govan et al. 2013.
- Kruijssen et al. 2013.
- Bell J.D. et al. 2008. Planning the use of fish for food security in the Pacific.

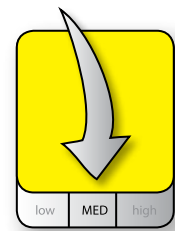


COASTAL WATER QUALITY

Selected water quality measures based on pollutants, silts and E. coli.



FIGURE 3.22. Mataniko River mouth, Honiara (©Edward Danitofea, MECDM).



**Status**  
Fair

**Trend**  
Deteriorating

**Data confidence**  
Medium



FIGURE 3.23. BMSI Lavangu port terminal, Rennell Island (©Edward Danitofea, MECDM)

Status and trend discussion

Preserving the pristine coastal water quality in the Solomon Islands has become a growing challenge for the country over the decades due to deforestation, mineral extraction, urban developments, land use activities and poor waste management (Figure 3.22, 3.23). Despite this challenge, little data is available for specific sites where studies have been conducted.

One case study is the Teterere bay coastal water quality assessment conducted by the University of Queensland to ascertain the level of impact to the marine environment from the Gold Ridge mining, Guadalcanal, Solomon Islands (Figure 3.24). The assessment was done on behalf of the Solomon Islands Government through the Ministry of Environment Climate Change Disaster Management and Meteorology. One of the key elements to undertake the assessment is to confirm the level of coastal water contamination and thus provide a baseline for decision-making relating to the dewatering process of the tailings storage facility that is safe for the health and environment of the downstream community. The catchment area of Matepono is 206 km<sup>2</sup> (Albert et al. 2016) and includes the Gold Ridge mine and a large-scale oil palm plantation located in the downstream plains of Teterere bay. Both developments can contribute to the status of the coastal water quality of Teterere bay. Water and sediment sampling in the bay was conducted at 24 onshore and offshore sites and showed that water quality within Teterere bay varied depending on sampling location. Dissolved metal within was mostly present at very low or undetectable concentration (Albert et al 2016). For total metal

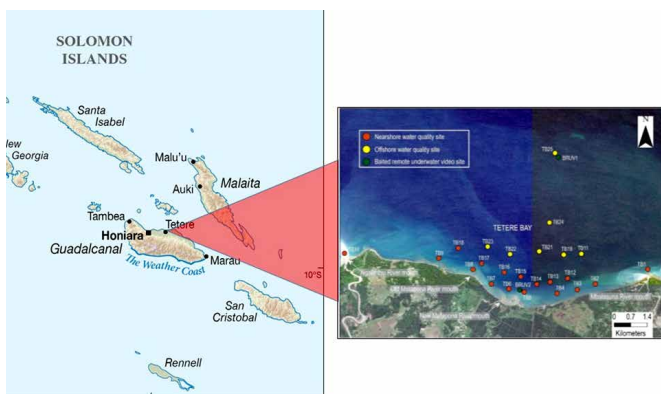


FIGURE 3.24. Water quality study site at Teterere bay, Guadalcanal with reference to Solomon Islands. (Albert et al. 2016)

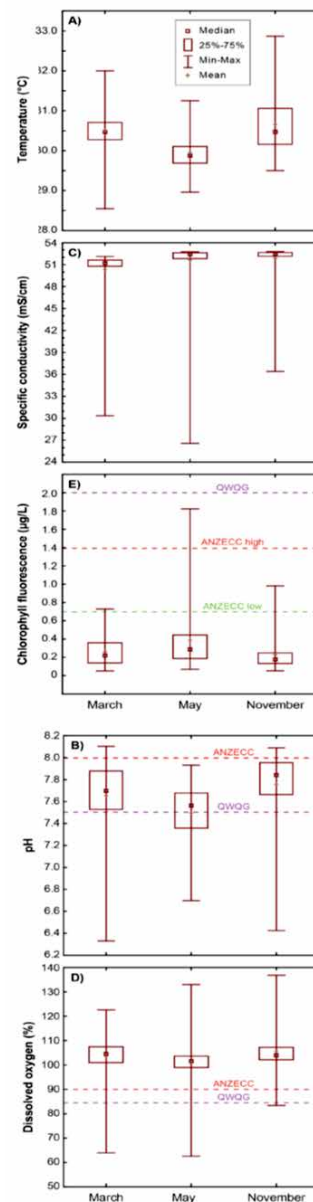
concentration in the bay, most metals concentration are found to be low except for copper and zinc which exceeded the relevant guideline used (Albert et al. 2016). Arsenic concentration was low at most sampling areas except for the area near the Matepono river mouth but concentrations were still below standard guideline values used (Table 3.5; Albert et al. 2016). The study found that aluminium, arsenic, copper and nickel were present in relatively high concentrations in sediment (Table 3.5; Albert et al 2016). Arsenic concentration are above the ANZECC safe water guidelines (Albert et al. 2016). The high concentration of arsenic present was explained by recent deposition from the Matepono river mouth (Albert et al. 2016).

The 2013 baseline study for Sumitomo Metal Mining Solomons Limited (SMM Solomons Limited, 2014) EIS also provides some information on Choiseul which is likely to be relevant for most of Solomon Island coastal water quality (Figure 3.25). Readings for pH within the study area falls below the value set by ANZECC (pH 8 to 8.4) however within QWQG values (pH 7.5 to 8.4) (Figure 3.26; SMM Solomons Limited, 2014). Dissolved oxygen for several sites were found to be below ANZECC guidelines for fresh water (pH 6 to 8 for low land rivers) (Figure 3.26; SMM Solomons Limited, 2014). Chlorophyll (Chl) concentration is a very good indicator for nutrient influx into the marine environment (Figure 3.26). From the studied 52 sampling sites Chl concentrations were

low at all sites (0.1 to 0.3 µg/L) (Figure 74; SMM Solomons Limited, 2014). Few sites were found to exceed low level ANZECC guidelines of 0.7 µg/L with one site exceeding the higher – level ANZECC guideline of 1.4 µg/L, however all readings were below QWQG for lagoon water for the three months of monitoring (Figure 74; SMM Solomons Limited, 2014). The findings fall in the range expected for all tropical inshore areas which occasionally experience an influx of sediments and nutrients from inland (SMM Solomons Limited, 2014). Turbidity was found to be below ANZECC (1 to 20 NTU) and QWQG (10 NTU) guidelines for coastal water and lagoons. All readings for turbidity were between 0.2 to 1.5 NTU, which indicates very clear waters (SMM Solomons Limited, 2014). Total nitrogen concentrations were between 0.11–0.17 mg/l (SMM Solomons Limited, 2014), similar to Marovo lagoon, Solomon Islands (SMM Solomons Limited, 2014). Nitrogen oxide was quite high and exceeds ANZECC guidelines at some sites (SMM Solomons Limited, 2014). Reactive phosphorous concentration falls below 0.001 mg/l to 0.026 mg/l whilst some inshore sites were above the

**TABLE 3.5.** Example of results of metal concentrations in sediment across Tetera bay, Guadalcanal. Results in red exceed safety thresholds (Albert et al. 2016).

Site	Aluminium mg/kg	Arsenic mg/kg	Copper mg/kg	Nickel mg/kg	Lead mg/kg	Antimony mg/kg	Total CN mg/kg
<b>Nearshore sites</b>							
<i>Mbalasuna River</i>							
TB1	27500	5.6	84.8	208	1.4	<0.1	<1
<i>Ngalimbiu River</i>							
TB10	23600	2	78.5	17.3	1.2	<0.1	<1
<i>Metapona River</i>							
TB2	38000	31.7	112	99.9	4.2	0.3	<1
TB3	25800	13.6	42.2	86	2	<0.1	<1
TB4	32200	26.6	64.1	62.1	3	0.1	<1
TB5	41300	40.5	84.8	64.8	4.7	0.3	<1
TB6	34800	37.7	68.8	45	4.4	0.2	<1
TB7	26700	13.3	50.5	34	2.1	0.1	<1
TB8	23500	9.6	41.5	26.3	1.8	<0.1	<1
TB9	23400	7.4	44.8	22.4	1.4	<0.1	<1
TB12	26600	5.2	74.2	178	1	<0.1	<1
TB13	32100	11.6	91.5	108	2.1	<0.1	<1
TB14	36900	22.4	91	77.6	3.1	0.2	<1
TB15	37400	12.2	110	82.9	2.5	<0.1	<1
TB16	37200	13.9	111	65.6	2.9	<0.1	<1
TB17	37800	9.9	120	47	2.6	<0.1	<1
TB18	35900	7.9	108	40.7	2.6	<0.1	<1
<b>Offshore sites</b>							
TB11	33500	12.4	79.7	105	2	<0.1	<1
TB19	39500	8.9	116	83.5	2.6	<0.1	<1
TB21	44600	10.5	121	67.3	2.9	<0.1	<1
TB22	51000	7.8	149	57.9	2.9	<0.1	<1
TB23	42400	8.7	109	53.7	2.6	<0.1	<1
TB24	35600	17.8	69	95.4	1.9	0.1	<1
TB25	3790	3.1	8.8	7.6	0.7	<0.1	<1



**FIGURE 3.26.** Example of water quality ranges for 52 sites for A) Temperature, B) pH, C) Conductivity, D) Dissolved Oxygen, E) Chlorophyll (SMM Solomons Limited, 2014).

ANZECC guideline (0.005mg/l) (SMM Solomons Limited, 2014). Cobalt, copper and manganese were above ANZECC at two study sites (SMM Solomons Limited, 2014). Copper exceeded ANZECC guidelines at one offshore site and Zinc at two offshore locations (SMM Solomons Limited, 2014). All sampling locations and other metals are below the safe guideline. For marine sediment characteristics within the study site, total organic carbon levels at inshore sites were tenfold that of nearby coastal waters (SMM Solomons Limited, 2014). Elevated organic carbon in the sediment were believed to come from terrestrial sources through the river systems as observed by the high organic carbon in settling tube sediment (SMM Solomons Limited, 2014). Chromium, arsenic, copper and nickel concentrations in sediment exceeded the safe guideline for several inshore sampling locations (SMM Solomons Limited, 2014). Mercury concentrations were higher than safe guidelines at one sampling location near of the river estuary (SMM Solomons Limited, 2014). The study also analysed for a broad range of chemical pollutants in sediment samples including herbicides, pesticides, hydrocarbons and phenols (SMM Solomons Limited, 2014). However, there was no detection of these pollutants being observed to have contaminated the marine environment of the study area (SMM Solomons Limited, 2014).

The key conclusions of the 2013 baseline study are as follows;

- Water quality varies a lot over time (between sampling events) and space (between sites), however there was a general pattern of lower water quality inshore compared to offshore areas.
- Dissolved oxygen, salinity, pH, temperature and conductivity seems to fall within the accepted tropical coastal marine water quality.
- All readings and observation for turbidity, total suspended solid, light attenuation and Secchi depth shows inshore water of the study area have significant turbidity compared to offshore due to influx of suspended sediment from the nearby rivers.

- Inshore areas occasionally have elevated turbidity levels exceeding the ANZECC guideline of 20 NTU.
- The pristine environment of the catchment area and intact marine ecosystem of the coastal waters indicates that ANZECC guidelines for turbidity are not reliable to use at this site.
- Nutrients and metals concentrations were observed to exceed the ANZECC guideline at some inshore sampling sites.
- Toxic hexavalent chromium was not detected in both marine water and sediments.

## Impact

There are clear links with people's health and wellbeing through direct effect of pollutants as well as flow-on effects in the food chain. Examples of impacts of silts from run-offs, *E. coli* and open defecation.

## Response and recommendations

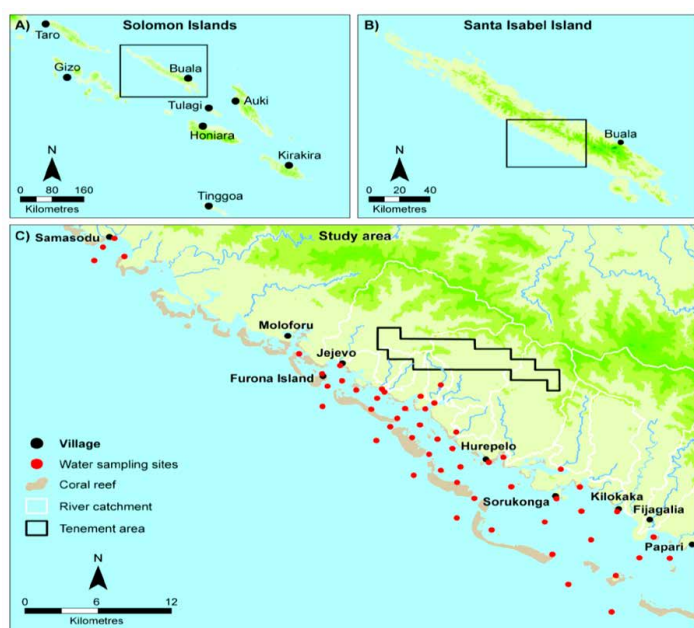
Current monitoring of coastal water quality is restricted to particular incidents/localities, or through monitoring associated with development projects. It is important that developers (e.g. infrastructure, forestry) are required to establish baseline coastal water quality and monitor/remediate any adverse effects. There is also a need to develop national water quality standards.

## References

Simon Albert, Alistair Grinham, Alec Hughes, Elisabeth Johnstone, Allen Kisi, Joshua Kera (2016). Rapid Assessment of Metapona River Mouth, Tetere bay, Solomon Islands. Ministry of Environment Climate Change Disaster Management and Meteorology, The University of Queensland.

SMM Solomon Limited (2013). Jejevo/Isabel B Environment and Social Impact Assessment Report Volume 2 (Marine Water and Sediment Quality Baseline Report). A report produced for the Environment Impact Assessment prepared for the Government of Solomon Islands as required under the Environment Act 1998. Solomon Islands Government, Honiara, Solomon Islands.

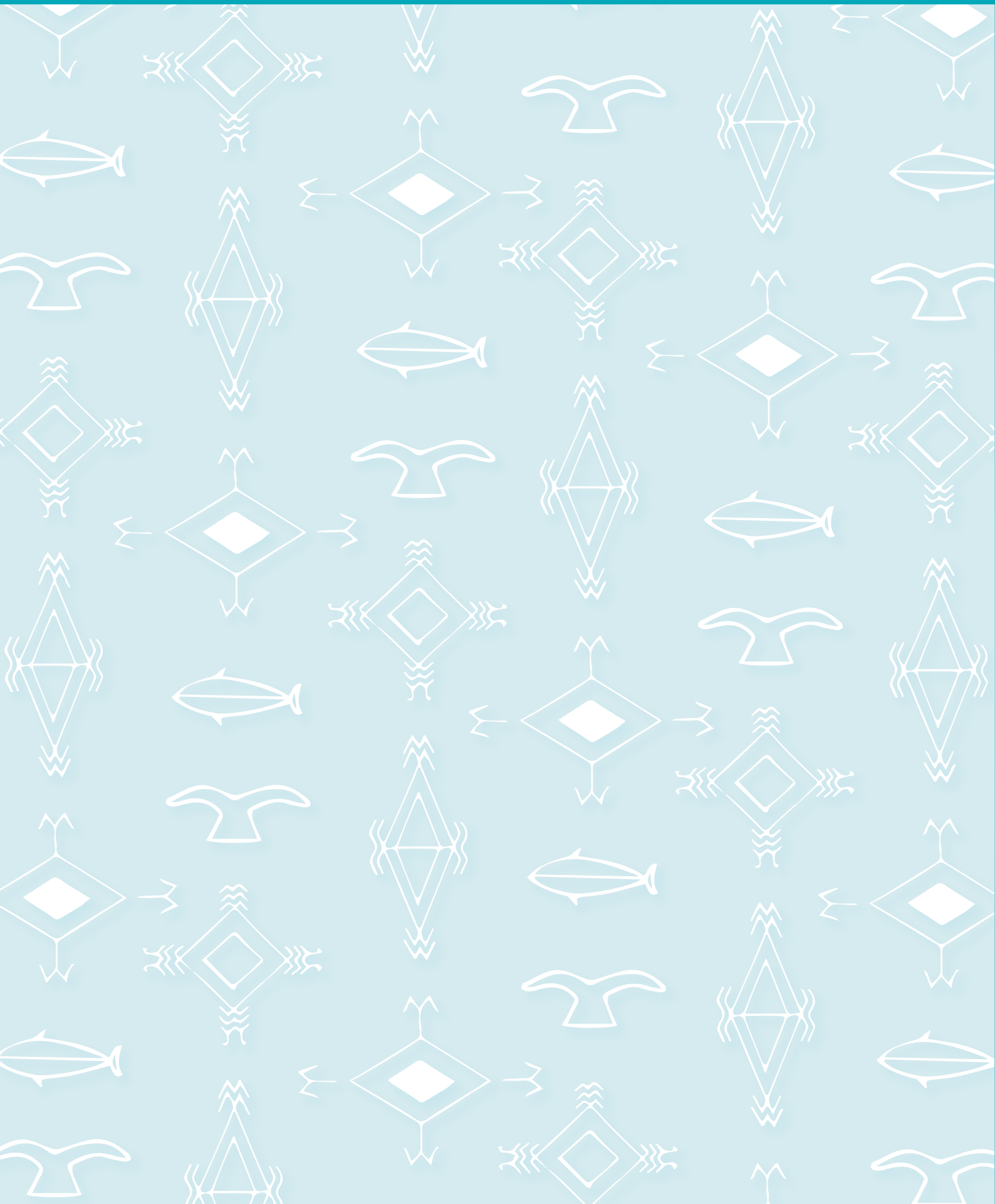
Turner, C., Eade, J., Danitofea, S., and Oldnal, R. 1977. Gold-bearing Sediments on the Continental Shelf, Northern Guadalcanal, Solomon Islands. Committee for Co-Ordination of Joint Prospecting for Mineral Resources in South Pacific Offshore Areas.



**FIGURE 3.25.** Map of Local Study Area and Sampling Sites Relative to A) Solomon Islands, B) Santa Isabel Island and C) Local Study Area. (SMM Solomons Limited, 2014).



# THEME 4 FRESHWATER RESOURCES



## THEME 4 FRESHWATER RESOURCES

Water resources availability in Solomon Islands varies considerably for each island but on the larger islands can be considered as very abundant. It ranges from sizeable rivers on the larger mountainous islands with dense tropical rainforests, to those small low-lying atolls and islets which rely upon rainwater harvesting and thin freshwater lens for their freshwater needs.

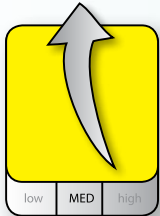
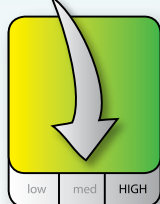
Freshwater resources are used for a range of purposes including household uses (such as drinking and washing), sanitation, agriculture, industry and hydro power generation. Freshwater in rivers and lakes also supports local biodiversity.



Photo © Stuart Chape



WATER HIGHLIGHTS

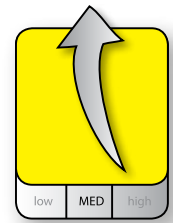
INDICATOR	STATUS AND TREND	KEY FINDINGS	RESPONSE AND RECOMMENDATIONS
<p><b>ACCESS TO FRESHWATER</b></p>	 <p><b>Status</b> Good</p> <p><b>Trend</b> Improving</p> <p><b>Data confidence</b> Medium</p>	<p>The majority of households in the Solomon Islands do not have access to improved water supply.</p> <p>Only 35–40% of rural communities have access to basic drinking water.</p> <p>In 2013 88% of Solomon Islands health facilities did not have a functioning water supply.</p>	<p>Solomon Islands RWASH Strategic Plan 2015–2020 outlines targets and strategies to increase the access to improved water supplies from 35% of the population in 2014 to 52% in 2019 and 97% in 2024.</p> <p>WATSAN Policy.</p>
<p><b>WATER QUALITY</b></p>	 <p><b>Status</b> Good to Fair</p> <p><b>Trend</b> Deteriorating</p> <p><b>Data confidence</b> High</p>	<p>Uncontrolled sediment runoff is very significant at numerous logging sites.</p> <p>The catchments surrounding the Gold Ridge mine in Guadalcanal have elevated turbidity, metals and arsenic above safe guidelines.</p> <p>Faecal contamination of bore water from overflowing septic tanks and open defecation, no treatment facility is likely a widespread issue in the Solomon Islands.</p> <p>High population along water catchments and improper waste management.</p> <p>Impacts from agricultural developments-use of fertilisers, sedimentation (gap).</p> <p>Impacts to health water-borne diseases (gap).</p>	<p>Implement ongoing monitoring programme for all Prescribed Developments in Gold Ridge mine catchment to ensure the ecosystem services of food and water for the local communities continue to be safe.</p> <p>Development proposals must have conditions imposed to ensure that any impacts to water quality are within acceptable levels.</p> <p>Development of National standard for Water Quality.</p> <p>Develop baseline for water quality in Solomon Islands.</p> <p>Develop a National Water Safety Management Plan.</p>

ACCESS TO FRESHWATER

% of households with access to improved water supply with specific targets outlined below.

Status and trend discussion

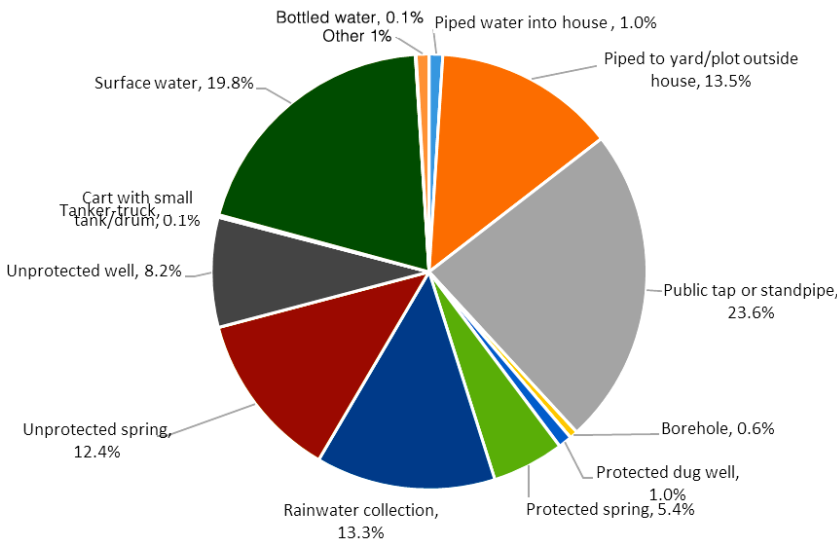
Water supply in urban areas is the responsibility of Solomon Water in Honiara, Auki, Noro and Tulagi (Solomon Islands Government 2015). Water in other urban centres is provided by the Works Department, Ministry of Infrastructure Development. The majority of households across the Solomon Islands do not have access to improved water supply (Figures 4.1, 4.2), particularly in rural areas where 80% of the population lives. The Solomon Islands Government estimates that only 35–40% of rural communities have access to basic drinking water (Solomon Islands Government 2015). In 2013 88% of Solomon Island health facilities did not have a functioning water supply (Solomon Islands Government 2015).



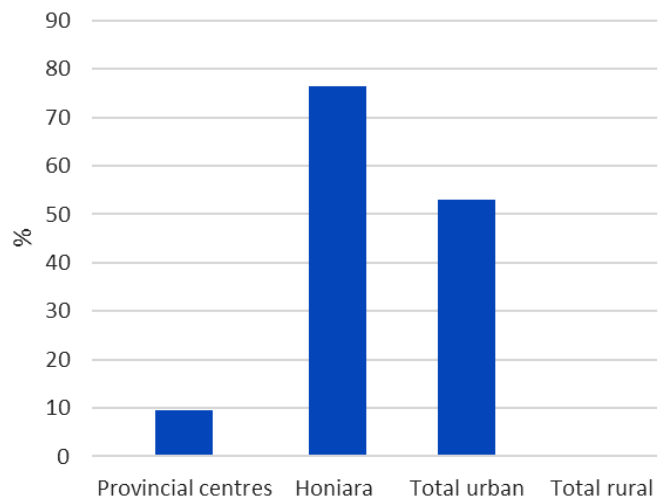
**Status**  
Good

**Trend**  
Improving

**Data confidence**  
Medium



**FIGURE 4.1.** Household water source access types in the Solomon Islands (2016 National Preliminary Analysis).



**FIGURE 4.2.** Households with metered piped drinking water across different location and household types (Solomon Islands National Statistical Office, 2009).

## Impact

Inadequate water, sanitation and hygiene (WASH) contributes to the prevalence of diarrhoea and other diseases and to high levels of malnutrition in the country (Solomon Islands Government 2015). The World Health Organisation estimated that 8% of all deaths in the Solomon Islands are WASH-related. In addition, community members - mostly women and girls - spend hours each day collecting water for their families, time which could be used more productively on other tasks (Solomon Islands Government 2015).

## Response and recommendations

The Solomon Islands RWASH Strategic Plan 2015–2020 (Solomon Islands 2015) outlines targets and a strategy to increase the access to improved water supplies from 35% of the population in 2014 to 52% in 2019 and 97% in 2024. There is strong evidence, globally, that WASH interventions have a positive impact on health outcomes by reducing morbidity and child mortality due to diarrhoeal diseases and viral respiratory tract infections (Solomon Islands Government 2015). The World Health Organization includes improved WASH as one of five strategies to prevent and control neglected tropical diseases (NTD), such as trachoma and yaws, which are both endemic in the Solomon Islands (Solomon Islands Government 2015).

Other responses include:

- Awareness on water management, health and hygiene
- Solomon Islands Ridge to Reefs Project
- Protected Areas
- Water catchment management
- Mataniko Waste Management Programme
- Code of Logging Practice
- Water Quality National Standard
- PEBACC- Ecosystem Based Valuation

## References

Solomon Islands National Statistical Office (2009). 2009 Population and housing census: Report on Migration and Urbanisation. Ministry of Finance and Treasury, Honiara.

Solomon Islands Government (2015). Strategic Plan Rural Water Supply, Sanitation and Hygiene 2015–2020. Honiara, Solomon Islands.

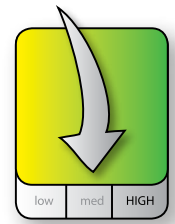
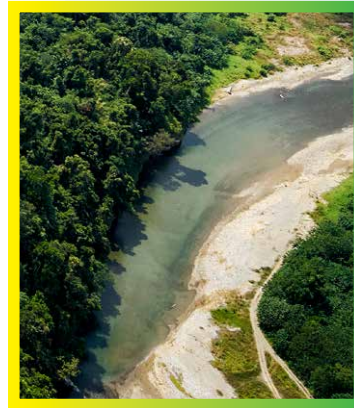


Photo © Stuart Chape



**WATER QUALITY**

This indicator reviews selected parameters for surface water and ground water (bore-hole and wells) water quality (e.g Bacteria -- E coli, Nutrients, metals, turbidity, dissolved oxygen).

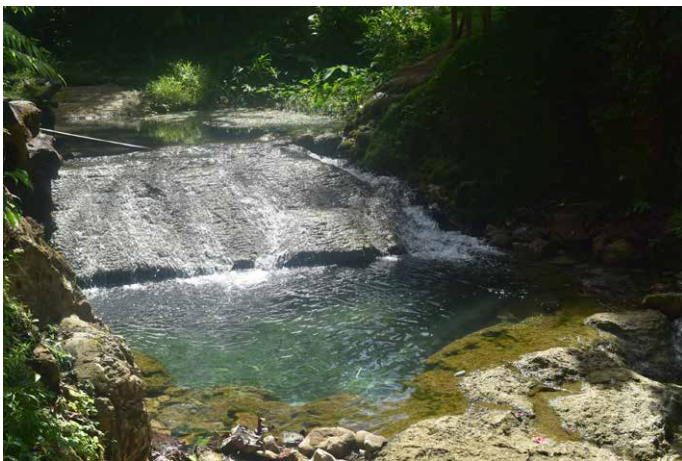


low med HIGH

**Status**  
Good to Fair

**Trend**  
Deteriorating

**Data confidence**  
High



**FIGURE 4.3.** Freshwater Source in Henaniasi, South Malaita, Malaita Province (©Allen Kisi, MECDM).

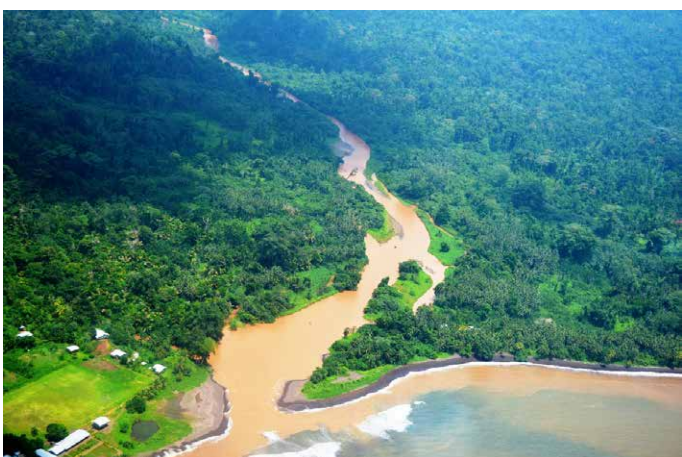


**Status and trend discussion**

On the larger islands the issue of water quality is one of the major concerns, particularly in areas of high impact activities such as deforestation, mineral extraction and land use activities such as agricultural activities (Figure 4.3). It is understood that uncontrolled sediment runoff is very significant at numerous logging sites (Figure 4.4).

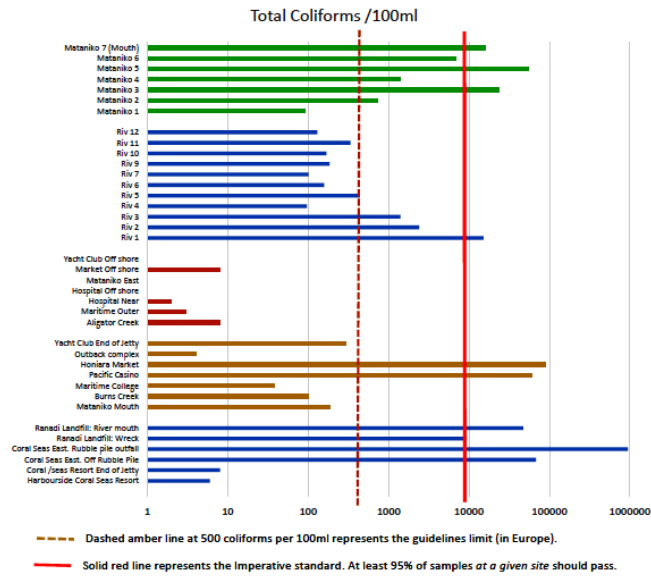
Under the Commonwealth Marine Economies Programme (CMEP), the Centre for Environment Fisheries and Aquaculture (Cefas, <https://www.cefass.co.uk>) conducted research on water quality in and around Honiara, in Sep 2018. Water samples from 37 different marine and freshwater sites were analysed for Total Coliforms and showed many breaches of safe use thresholds (Figure 4.5).

Groundwater development has mostly taken place in and around Honiara on the island of Guadalcanal for Honiara City water supply (discussed further under Built Environments). Elsewhere water quality analysis available within the Solomon Islands is limited. Faecal coliform and high nutrients have been detected in samples taken from boreholes with the suggestion that wastewater leachate contamination from overflowing septic tanks during heavy rains is a common occurrence and impacting on water supplies.

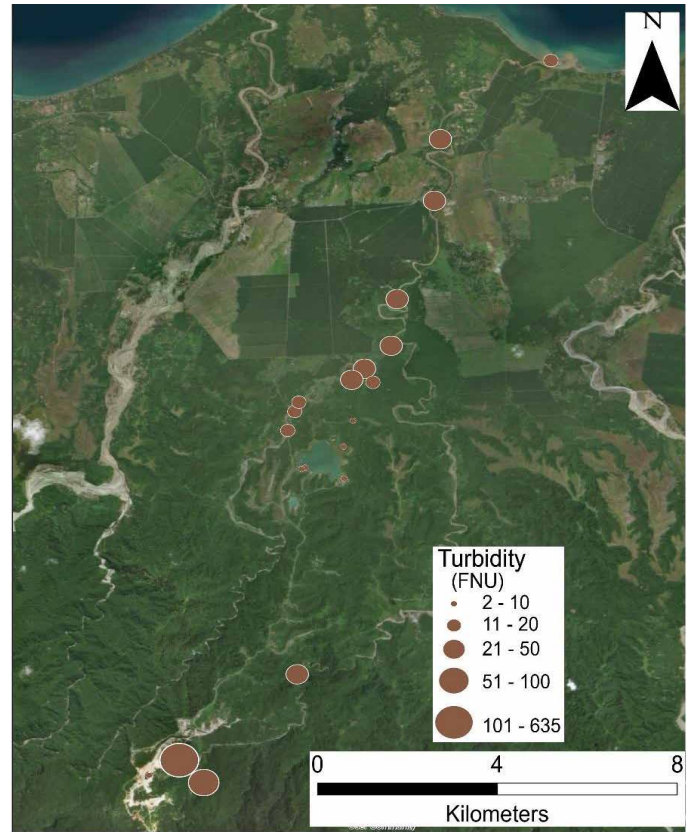


**FIGURE 4.4.** High levels of turbidity in river passing through a logging concession area, Isabel province (©Edward Danitofea, MECDM).

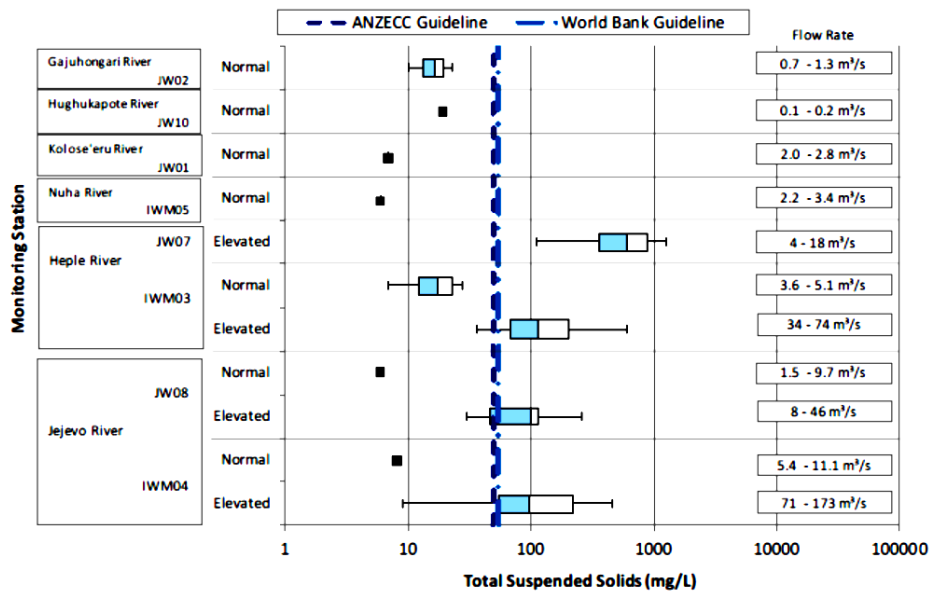




**FIGURE 4.5.** Total Coliform counts in different sites in and around Honiara (Cefas, CMEP Report 2018).



**FIGURE 4.6.** Example of freshwater quality monitoring for turbidity within river systems downstream of Gold Ridge mine (Albert et al. 2018).



**FIGURE 4.7.** Example of freshwater quality monitoring for total suspended solids (SMM Solomons Limited).

Research was recently conducted on the catchments surrounding the Gold Ridge mine in Guadalcanal (Albert et al. 2017). The results showed substantial alteration of river courses and impacts to water quality. Specifically, water quality has been affected by elevated turbidity (2450 NTU), metal and arsenic levels (up to 0.141 mg/L in surface water; 265 mg/kg in sediment; Figure 4.6; Albert et al. 2017). Concentrations of aluminium, arsenic and copper in surface water were frequently above safe guidelines (Albert et al. 2017). Fluctuating arsenic levels in the overfull tailing dam storage facility presents an ongoing threat to the environment. Highly toxic arsenic is probably the most substantial threat, with sediment and water guideline levels in rivers exceeded 10-fold, and exceeded nearly 20-fold in the tailings dam sediments (Albert et al. 2017). On a positive note, the authors found no evidence that arsenic had bioaccumulated in locally harvested food (Albert et al. 2017).

Golders and associates undertook a baseline study for freshwater quality for the SMM Solomon Island limited Environment and Social Impact Assessment report. From the baseline studies it has found that the waterways included in the study generally have pristine water quality which meets the standard international water quality guidelines (SMM Solomons Limited, 2014). Physiochemical parameters were mostly within accepted guidelines (SMM Solomons Limited, 2014). However, turbidity exceeded the QWQG (2009) and ANZECC and ARMCANZ (2000) upper range (15 NTU) at two sampling locations and suspended solids at four locations (Figure 4.7) (SMM Solomons Limited, 2014). Total iron concentrations in elevated flow samples exceeded the World Bank guideline at one sampling point (SMM Solomons Limited, 2014). Dissolved metal concentrations were generally within World Bank guidelines except for a few dissolved metals (aluminium, copper, iron, zinc, cadmium, silver which exceed ANZECC and ARMCANZ at certain sampling points (SMM Solomons Limited, 2014). Lead, antimony, mercury, molybdenum and uranium concentration were below detection levels. Arsenic was observed to present at ultratrace level whilst hexavalent chromium was below the laboratory detection level (SMM Solomons Limited, 2014). Total phosphorous and Total nitrogen concentrations were within World Bank guidelines but exceed the QWQG (2009) and ANZECC and ARMCANZ (2000) (SMM Solomons Limited, 2014). Herbicides, pesticides and hydrocarbon concentration were below the laboratory detection limit. Presence of microbials (include E-coli) in fresh water were observed higher than WHO drinking water guidelines (SMM Solomons Limited, 2014). To differentiate between the presence of natural occurring bacteria and those related to poor sanitation was difficult to tell during the study. With that the results can be used as an indicator only (SMM Solomons Limited, 2014).

## Impact

Rivers and groundwater are important sources of drinking water throughout the Solomon Islands and impacts on water quality can affect human health and livelihoods. Pollution in rivers can also impact aquatic ecosystems. Major impacts to freshwater can result from poorly managed logging and mining operations.

## Response and recommendations

A number of legislative provisions apply with respect to water quality, including:

- Assistance to review River Waters Ordinance 1969: Watershed control in relation to the rivers only and regulates the use of designated river water through permit applications.
- Rivers and Waters Act.
- Environment Act 1998: makes provision for protection, preservation and conservation of the environment, prescribes an EIA process for development purposes.
- Environment Health Act 1980. Water Resource Assessment: surface water; rain catchment, ground water.
- Develop a National Monitoring Programme for recreational facilities and drinking water quality.
- WATSAN Policy.
- River Catchment management Plans.
- Protected Areas Act.
- Code of logging practice.
- Solomon Islands Water Authority Act.

Given the ongoing issues associated with the Gold Ridge mine, an ongoing monitoring programme should be implemented to ensure the ecosystem services of food and water for the local communities continue to be safe. Any new development should have conditions imposed which ensure that any impacts on water quality are within acceptable levels.

## References

- Albert, S., Kvennefors, C., Jacob, K., Kera, J., and Grinham, A. (2017). Environmental change in a modified catchment downstream of a gold mine, Solomon Islands. *Environmental Pollution* 231, 942–953.
- SMM Solomon Limited (2013). Jejevo/Isabel B Environment and Social Impact Assessment Report Volume 2 (Freshwater quality baseline report). A report produced for the Environment Impact Assessment prepared for the Government of Solomon Islands as required under the Environment Act 1998. Solomon Islands Government, Honiara, Solomon Islands.
- Cefas CMEP South Pacific. Water Quality. Data Summary from Research Trip Sep 2018.

THEME 5 LAND



Solomon Islands has a land area of 28,000 square kilometres with 4,023 kilometres of coastline and is the second largest in the Pacific after Papua New Guinea. The issue of customary ownership of land underpins decisions on use of land, including foreign investment such as logging and mining, commercial agriculture, urban planning, and conservation, with land reclamation as an emerging issue. Patterns of land use are determined largely by the customary land tenure system, which controls about 85% of the total land area in Solomon Islands. The current traditional system of land ownership provides a welfare safety net for the vast majority of Solomon Islanders. Customary land tenure also supports

the country's robust village-based subsistence farming. At the same time, customary ownership is a major constraint that hampers economic development and integrated land use management and planning. Mobilising land for large-scale economic projects is especially problematic, costly and fraught with uncertainty due to the inevitable and often multiple disputes that arise between owners and developers, or different landowner groups. The preferred method for gaining the rights to use land is through lease arrangements. However, even legally binding leases and contracts do not ensure that the terms of the agreement will be honoured.



Photo © Stuart Chape



## LAND HIGHLIGHTS

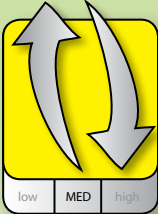
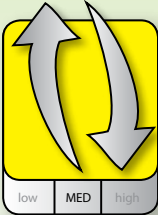

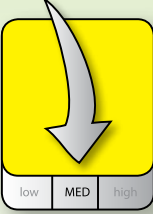
INDICATOR	STATUS AND TREND	KEY FINDINGS	RESPONSE AND RECOMMENDATIONS
LIVESTOCK PRODUCTION	 <p><b>Status</b> Fair</p> <p><b>Trend</b> Mixed</p> <p><b>Data confidence</b> Medium</p>	<p>In 2014 the Solomon Islands livestock production index was 105, indicating food security.</p> <p>Subsistence production remains the principal food production system but there is potential for commercial agriculture.</p>	<p>The Solomon Islands Agriculture and Livestock Sector Policy 2015–2019 promotes sustainable smallholder and commercial livestock development.</p> <p>Manage environment effects of livestock production.</p> <p>Environment Management Plans put in place for livestock production.</p>
AREA UNDER CULTIVATION	 <p><b>Status</b> Fair</p> <p><b>Trend</b> Mixed</p> <p><b>Data confidence</b> Medium</p>	<p>In 2016 about 7.77% or 2176 km<sup>2</sup> of the Solomon Islands land area was 'cropland'.</p> <p>Dominant crop types were mixed subsistence agriculture, followed by coconut, mixed crops (including coconut overstorey) and palm oil.</p> <p>Between 2000–2016 the increase in cropland was &lt;1%.</p>	<p>The Solomon Islands Agriculture and Livestock Sector Policy 2015–2019 includes extensive proposals to enhance agricultural production and manage its environmental effects.</p>



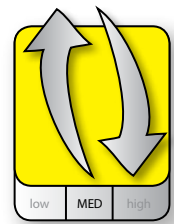
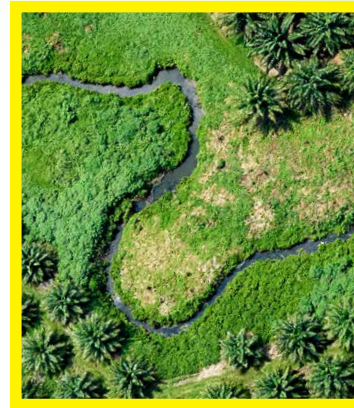
Photo © Stuart Chape

## LAND HIGHLIGHTS

INDICATOR	STATUS AND TREND	KEY FINDINGS	RESPONSE AND RECOMMENDATIONS
<p><b>FOREST HARVEST</b></p>	 <p><b>Status</b> Poor</p> <p><b>Trend</b> Deteriorating</p> <p><b>Data confidence</b> Medium</p>	<p>Forestry contributes about 10% to the Solomon Islands GDP.</p> <p>Solomon Islands is felling its tropical forests around 12–14 times the sustainable rate of 250,000 cubic metres per year.</p> <p>Log exports have increased from &lt;500,000 cubic metres in 2002 to about 2.5 million tons in 2016.</p>	<p>Strengthen enforcement for logging companies on reforestation responsibilities under the logging license, including site remediation and environmental monitoring.</p> <p>Record of logging shipment to be put in place.</p> <p>Cultural and heritage significant sites are protected.</p> <p>Capacity building training for forest officers on monitoring and enforcement to be strengthened.</p> <p>Develop multipurpose forestry inventory.</p> <p>Government to strengthen its support financially and technically on logging monitoring and enforcement.</p> <p>All logging proposals must undertake the EIA process required under the Environment Act before issue of logging license. This is to be strengthened.</p> <p>Review and increase logging license fees and keep in a separate account for the Forestry sector.</p> <p>Strengthen collaboration between bio-security port/ customs security measures on logging machinery imported.</p> <p>Review of fines and penalties on breaches of the Forest Act.</p>
<p><b>MINING</b></p>	 <p><b>Status</b> Fair</p> <p><b>Trend</b> Deteriorating</p> <p><b>Data confidence</b> Medium</p>	<p>Mining contributed less than 1% to GDP in 2014.</p> <p>In 2018 the total area of active leases was 96 km<sup>2</sup> and there were 30 prospecting licence tenements covering 9829.4 km<sup>2</sup>.</p>	<p>Review Mines and Mineral Act needs to involve landowners and harmonise with the Environment Act.</p> <p>Prepare village disaster risk plans with simulation exercises for communities living downstream from the tailings dam.</p> <p>Strengthen laboratories with sufficient equipment for testing to meet international standards.</p> <p>Develop environment standards to address mining operations environment discharges.</p> <p>Strengthen public hearing process in all mining operations as required under the EIA process.</p> <p>Strengthen capacities of mining regulators in monitoring and enforcement.</p> <p>Strengthen awareness on the mining approval process with resource owners.</p> <p>Develop a Mining EIA Guideline. This is to reflect the EIA process for mining, and to the stage of mining operation closure, which will cover post-mining rehabilitation.</p>

LIVESTOCK PRODUCTION

This indicator summarises livestock production across key livestock species.

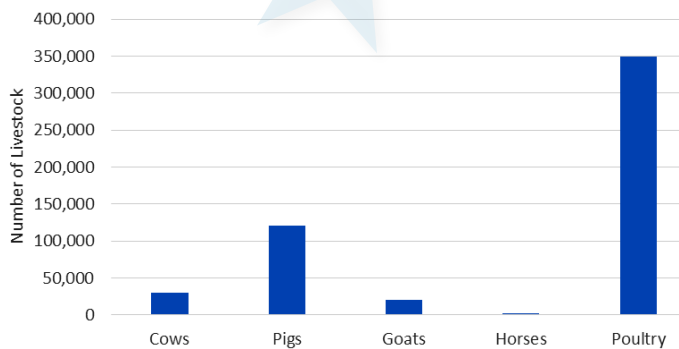


Status  
Fair

Trend  
Mixed

Data confidence  
Medium

CBD	SDG	
		2.3 no relevant indicator
		2.4, 2.4.1

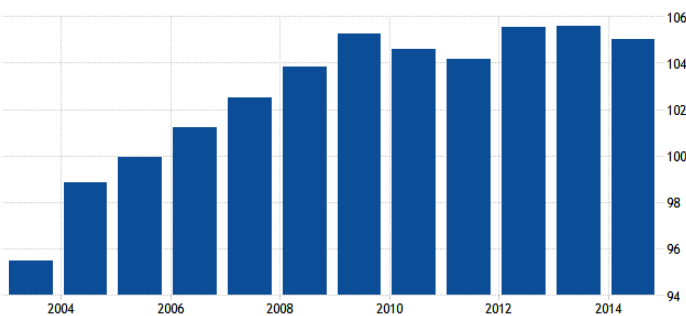


**FIGURE 5.1.** Total numbers of livestock in the Solomon Islands 2009 (Solomon Islands Government, 2009).

Status and trend discussion

Agriculture is still a key sector contributing 16% to the national GDP. The livestock sub-sector consists of local inbred and free-range pigs, backyard chickens, cattle (Figure 5.1). Pigs (mainly free-range) and backyard poultry are kept for protein intake and in the case of pigs, ceremonial purposes, and wealth accumulation (The Solomon Islands Agriculture and Livestock Sector Policy 2015–2019).

Agricultural Census in 2009 recorded a large number for poultry relative to other livestock at around 350,000, followed by pigs at about 120,000, heads of cattle at 25,000, and goats around 10,000 (Solomon Islands Government, 2009). As poultry farming is mainly free-range there is not an expectant adverse impact on the environment. Similarly, insignificant numbers of pigs, cattle, and goats will have minimal environmental impacts.



Livestock production index includes meat and milk from all sources, dairy products such as cheese, eggs, honey, raw silk, hides and skins. Livestock production index was 105 in 2014 with the index at 100 during the period 1999–2001, in 1961 the index was 31 (World Bank collection of indicators). Production of meat and dairy (including honey) have levelled off and are steady at the 100-mark index for the past decade indicating food security is assured (Figure 5.2).

**FIGURE 5.2.** Livestock production index (1999–2001 = 100) in Solomon Islands was reported at 105 in 2014, according to the World Bank collection of development indicators, compiled from officially recognised sources.

Subsistence production remains the principal food production system but there is potential for commercial agriculture. Around 90% of households keep one to five pigs. Heads of cattle have declined dramatically over the years, and a thriving bee industry produced over 75 tonnes of honey per year from 200 beekeepers (New Agriculturists 2009).



## Impact

Smallholder livestock farming is still the principal livestock production system. The Solomon Islands Agriculture and Livestock Sector Policy 2015–2019 targets the revival of the cattle industry and to improve the production and sustainability of small livestock projects. With most households raising pigs primarily for traditional ceremonies, the concern is with the impact of livestock pens to the health of the community, as well as pig waste on the environment and water springs. Livestock production is guided by policies and strategies put in place by the Ministry of Agriculture and Livestock.

## Response and recommendations

The Solomon Islands Agriculture and Livestock Sector Policy 2015–2019 promotes smallholder and commercial livestock development in an environmentally friendly way and deliver quality livestock and veterinary services. Targeted activity is to promote an enabling environment and facilitate industry strengthening and private sector investments in commercial livestock developments, smallholder production, slaughter, processing, and marketing facilities and access developments. Livestock research and development is looking into systems and technologies which increase production, improve performance and provide such information to MAL extension services and stakeholders.

Develop waste management plan to address waste management issues for large scale commercial production systems.

Manage environment effects of livestock production in order to reduce pollution of receiving environments.

Environment Management Plans put in place for livestock production.

## References

The Solomon Islands Agriculture and Livestock Sector Policy 2015–2019.

Country Profiles, Solomon Islands, The New Agriculturists (2008). Available <http://www.newag.info/en/country/profile.php?a=585>.

World Bank Collection of Development Indicators (2018) Available <http://datatopics.worldbank.org/world-development-indicators/>.

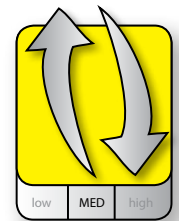
Solomon Islands Government (2009). 2009 Population & Housing Census National Report (Volume 2). Ministry of Finance and Treasury, Honiara.



Photo © Stuart Chape

## AREA UNDER CULTIVATION

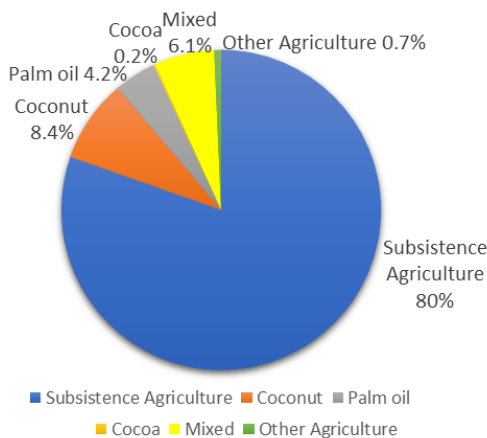
The crops sector has two distinct modes of production: large scale commercial plantations produce major crops for sale and export, and subsistence and small-holder farming produces for local consumption and sale. Large-scale farming focusses on several major commodities such as coconut, oil palm and rice, with future emphasis on other crops such as coffee and cocoa, as well as high value niche products such as vanilla/spices. This indicator assesses the area under cultivation for crops.



**Status**  
Fair

**Trend**  
Mixed

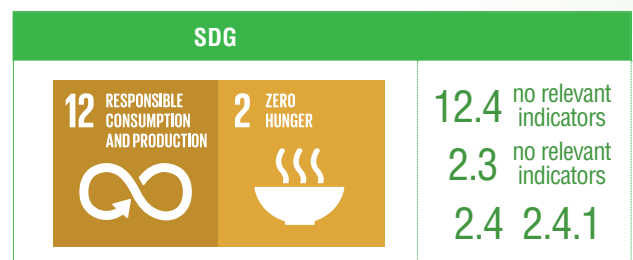
**Data confidence**  
Medium



**FIGURE 5.3.** Percentage of the total cropland comprising each major crop type in Solomon Islands, 2016 (The Forest and land use composition of the Solomon Islands study 2016).



**FIGURE 5.4.** Palm Oil plantation and refinery, Guadalcanal. © Stuart Chape.



### Status and trend discussion

The Forest and land use composition of the Solomon Islands study in 2016, shows 7.77% of the total land area was ‘cropland’. Given that the total Solomon Islands land area is 28,000 square kilometres<sup>1</sup>, cropland thus comprises 2176 square kilometres. In 2016 the dominant crop type was mixed subsistence agriculture followed by coconut, mixed crops (including coconut overstory) and palm oil (Figures 5.3; 5.4). Cocoa and ‘other’ agriculture make up the remaining area under cultivation.

Between 2000 and 2016 the overall increase in cropland was less than 1% based on the forestry and land use study’s interpretation of land use change. That study also showed that as at 2016, 15% of forest land had been ‘disturbed’ by ‘temporary gardening’, largely since 2000.

Coconut and cocoa production over the period 2008–2017 indicated a steady level of production for coconut at around 5,000 tonnes per year (Figure 5.3). Cocoa production levels peaked at just under 40,000 tonnes in 2008 dropping to just under 15,000 tonnes in 2013 then levelled off at 25,000 tonnes in 2017 (Figure 5.5). However, land under coconut was higher at 8.4% of total crop land compared to cocoa with relatively higher yields but from a small land area of only 0.2% of total cropland (CEMA Information Unit 2018).

The Solomon Islands Agriculture and Livestock Sector Policy 2015–2019 attributes the decrease in production of major crops including cocoa to a number of factors, including the April 2014 flash floods, volatile prices, high transportation costs, low yielding plantations, lack of

improved production technologies in the farming systems, lack of inputs of production, increasing pest and diseases, soil degradation, lack of production incentives, declining export prices, limited market opportunities, limited access to land and most importantly lack of private and public investment in the sector. Furthermore, the instability in political and economic environment has hampered the development of the sector.

## Impact

Expansion of the area of cropping has impacts in terms of change of land use (loss of forests and its impact on biodiversity, flora and fauna), water quality and cultural/heritage and conservation sites. Cropping activities and businesses use chemical treatments (fertilisers and pesticides) that can have downstream effects on the environment and human health.

Pests and invasive species have a negative impact on agricultural production e.g. Rhinoceros beetle (coconuts), giant African snail (root crops, leafy vegetables); in some cases, these pests are more prevalent in aging stocks, (e.g. senile coconut plantations). Invasive pests have a negative effect on indigenous ecosystems and biodiversity.

Climate change is expected to affect a range of factors associated with crop production, including crop species tolerance to climate conditions such as drought.

Loss of cultivated area or productivity may result in an increased reliance on imported foods for the Solomon Islands.

## Response and recommendations

The Solomon Islands Agriculture and Livestock Sector Policy 2015–2019 includes extensive proposals to enhance agricultural production and manage its environmental effects. These include promoting soil conservation and access to productive land, managing climate change effects, supporting pest management and biosecurity, and organic agriculture. Many of these issues need basic research before they are implemented.

Identify techniques and technologies on adaptation of communities to climate change.

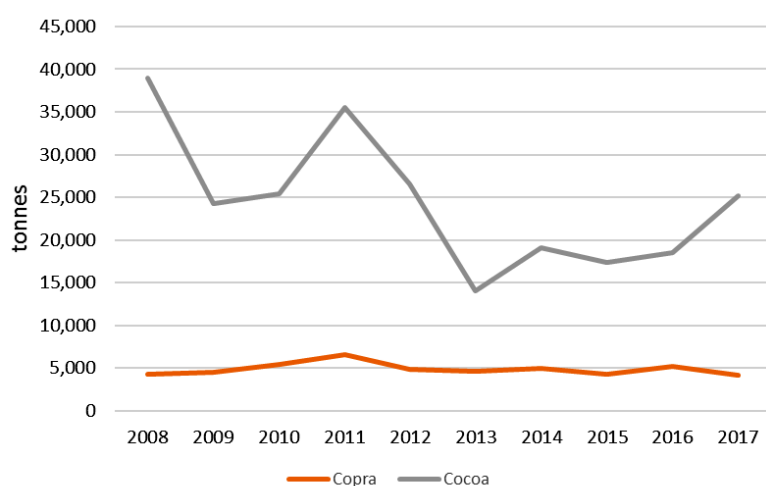
Support the implementation of the Solomon Islands Agriculture and Livestock Sector Policy 2015–2019 as it relates to crop production, with particular focus on:

- Strengthening research and extension to support farmers in sustainable agricultural production.
- Agriculture Census to be conducted.
- Training and awareness programmes provided to farmers on pesticide/chemical handling and disposal.
- Training farmers on adaptation techniques to climate change.
- Strengthen control and regular monitoring of pesticides coming into the country.
- Organic farming.
- Land capability and land use maps to be drawn up for the country.
- Promote the re-planting of coconuts and inter-cropping with cocoa.

## References

The Solomon Islands Agriculture and Livestock Sector Policy 2015–2019.

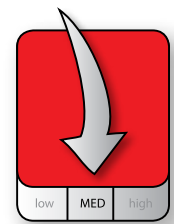
Ago, K. and Luda, O. 2016. The Forest and land use composition of the Solomon Islands study in 2016.



**FIGURE 5.5.** Solomon Islands copra and cocoa production 2008–2017 (CEMA information Unit 2018).

**FOREST HARVEST**

This indicator tracks the quantity of forest harvested measured through log and timber exports. The issue of loss of forest cover is discussed further in the Biodiversity thematic area.

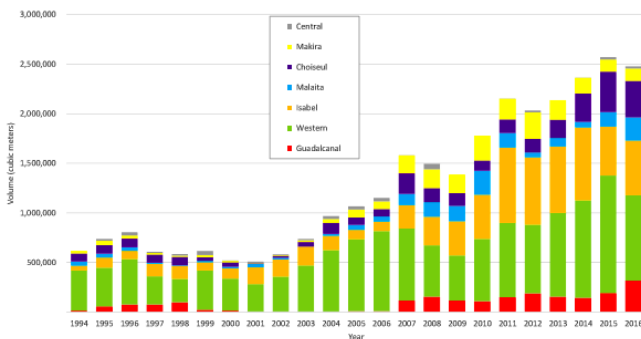


low MED high

**Status**  
Poor

**Trend**  
Deteriorating

**Data confidence**  
Medium



**FIGURE 5.6.** Solomon Islands log export volumes from 1994–2016 by province.

CBD	SDG		
			15.1 15.2 12.2

**Status and trend discussion**

Forestry is a major contributor to the Solomon Islands economy, accounting for approximately 10% of GDP in 2014.

Models generated by the Solomon Islands National Forest Inventory Project (SOLFRIP) in 1995 established a sustainable (non-declining) forest yield of 320,000 m<sup>3</sup> given the rates of logging at that time. Between 1995 and 2000 the annual harvest rate was exceeding 600,000 m<sup>3</sup> and new sustainable forest yield of 200,000 m<sup>3</sup> per year had to be set. After 2000 the annual harvests had reached more than 1,000,000 m<sup>3</sup>. Source: Forest and Land Use Change (2000–2006) in Solomon Islands.

Log exports have increased steadily in most Solomon Islands provinces since 2000 (Figure 5.6).

Solomon Islands is felling its tropical forests at nearly 20 times the sustainable rate. Export volumes of the archipelago’s single largest export commodity leapt more than 20 percent to just over 3 million cubic metres in 2017, worth \$3 billion Solomon Islands dollars (VAO east Asia report 2018).

**Impact**

The loss of harvestable forests will significantly affect national revenue given the importance of the forestry sector to the economy of Solomon Islands. Increased timber removals also mean less capacity for sequestration of CO<sub>2</sub> emissions.

Logging activity is also associated with a range of other adverse environmental and social effects, including:

- Loss of biodiversity, sedimentation of rivers and marine and deteriorating water catchments and water resources.
- Loss of wild fruits and medicinal plants.
- Chemical handling issues (timber treatment).
- Waste and pollution from chemicals and fuel.
- Social issues such as teenage pregnancy, break up of families and migrant workers.
- Community conflicts over land and forest ownership.
- Logged areas not being re-forested.
- Loss of cultural and heritage sites.
- Increased flooding incidents that cause damage to farmland affecting food security.

## Response and recommendations

Many of the impacts cited above are due to a lack of regulatory control (inadequate coverage of the current legislation including some obvious ‘loopholes’) and enforcement of permit provisions – including scope and extent of logging and environmental protection. In addition, there is a lack of coordination between the Environment, Agriculture and Forest Acts which could be addressed through a harmonised approach between agencies.

There is also concern about the distribution of benefits, and an interest in supporting local small-scale logging for local benefit.

It is encouraging that the Ministry of Forestry and Research is putting in place policies and strategies for the sustainable use of forestry resources specifically to promote downstream processing and timber industry, encourage replanting and reforestation schemes, protecting endangered plant species through establishing botanical gardens and herbariums, and encouraging forestry plantations with resource owners and landholders.

## Recommendations

Strengthen enforcement for logging companies held responsible for reforestation responsibilities under the logging license, including site remediation and environmental monitoring.

Record of logging shipment to be put in place.

Cultural and heritage significant sites are protected.

Logging licenses cannot be extended without application for new permit and full assessment/management of environmental effects.

Capacity building training for forest officers on monitoring and enforcement to be strengthened.

Develop a multipurpose updated forestry inventory.

Government to strengthen its support financially and technically on logging monitoring and enforcement.

All logging proposals must undertake the EIA process required under the Environment Act before issue of logging license. This needs to be strengthened and enforced.

Promote the use of the EIA Terms of Reference in all logging EIA reports and strengthen governance.

Review and increase logging licenses fees and keep in a separate account for the Forestry sector.

Strengthen collaboration between bio-security port/customs security measures on logging machinery imported.

Review of fines and penalty on breaches of the Forest Act.

Establish a special task force within police force to monitor and execute stop notices on illegal logging.

Need national forestry inventory, including carbon stock assessment and biodiversity.

Strengthen awareness on logging code of practise with landowners (as they are not aware).

Provide for an immediate standard fee/cost on rehabilitation of environment damages caused by logging and set up an Environment Trust Fund.

Promotion of portable sawmills for local timber needs and income generation.

## References

Forest and Land Use Change (2000–2006) in Solomon Islands.

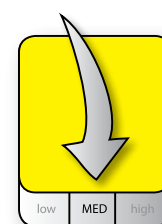
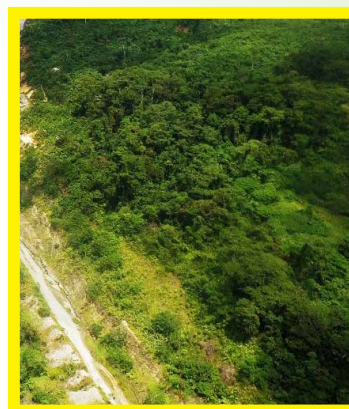
Ministry of Forestry and Research website.

VOA East Asia Report (<https://www.voanews.com/a/report-solomon-islands-logging-risks-forests/4618466.html>)

This indicator involves two parameters:

- Quantity and Type of minerals exported
- Area of mining and exploration tenements

Increasing quantity of minerals exported or in the area of mining tenements is likely to be associated with increased environmental impact.



**Status**  
Fair

**Trend**  
Deteriorating

**Data confidence**  
Medium

### CBD



**TABLE 5.1.** Summary of Solomon Islands gold and bauxite exports 2015–2018.

Mineral	Year	Invoice amount (SBD)	Gross weight (kg)
Gold	2015	10,158,010	22,411
	2016	17,938,964	11,721
	2017	25,599,134	10,204
	2018 (1/2 year)	10,914,760	75
Bauxite	2017	191,751,545	948,266,558
	2018 (1/2 year)	79,019,793	149,651,507

## Status and trend discussion

The mining sector contributed less than 1% to GDP in 2014 after averaging approximately 2.5% in 2012–13, and peaking at approximately 3.5% in 2011. The major mining products have been gold and bauxite (Table 5.1), although multiple prospecting tenement approvals have been issued, and investigations have been carried out in relation to other minerals such as nickel. In 2018 the total area of active leases was >131 km<sup>2</sup> (Table 5.2) and in 2019 there were 30 prospecting licence tenements covering 5,848.8 km<sup>2</sup> (Table 5.3; Figure 5.7). These data provide a baseline for tracking any expansion or decline of mining activity in future years.

**TABLE 5.2.** Summary of mining leases and tenements updated to 3rd quarter 2018.

Company Name	License number	Province	Project Area Name	Total Surface (km <sup>2</sup> )	ML Expiry Date	Prospected / Mined Minerals	Exploration Status
Gold Ridge Mining Ltd (GRML)	ML 01/1997	Guadalcanal	Gold Ridge Area	30	12 Mar 2022	Gold, copper & other minerals	Under-going refurbishment
Asia Pacific Investment Development Ltd/ Bintan Mining Solomon Ltd	ML 01/14	Rennell	West Rennell	NR	5 Sep 2014	5th Sep 2039	Bauxite
World Link Resources Ltd	ML 03/15	Rennell	Bughalimega Land	21	11 Mar 2025	Bauxite	Suspension Notice issued
Solomon Bauxite Ltd	ML 01/2016	Choiseul	Vaghena Island	45	16 Dec 2041	Bauxite	Valid
Axiom KB Ltd	ML 01/2018	Isabel	San Jorge	36	4 Sep 2043	Nickle, cobalt, scandium, silica, aluminium, magnesium and other associate minerals	Valid
Win Win Investment Solomon Ltd	ML 02/2018	Guadalcanal	Tuararana			Alluvial gold	Valid



**TABLE 5.3.** Summary of exploration tenements and prospecting company updated to 21st May 2019.

Company Name	Project Area Name	Prospecting License number & Status	PL Issued Date	Current Expiry Date	Province	Exploration Update	Total Surface area (km <sup>2</sup> )	Prospected/ Mined Minerals	Exploration Status
Solomon Bauxite Limited	Wagina	PL 73/11 (Renewed)	20 May 2014	20 May 2016	Choiseul	Surface Prospecting	120	Bauxite & Other Minerals	see Mining Lease Tab
Asia Pacific Investment Development Ltd	Rennell Island	PL 04/08	4 February 2013	4 Feb 2015	Rennell and Bellona Province	Surface Prospecting	560	Bauxite	see Mining Lease Tab
St Barbara Mining Ltd (GRML)	Mt Vunusa	PL 02/14	12 March 2014	12 March 2017	Guadalcanal Province	Surface Prospecting	130	Gold	Cancelled
	Lower Vunusa	LOI	25 November 2013	25 May 2014	Guadalcanal Province	Surface Prospecting	39	Au, Cu, Ag, Pb Zn	Expired
	Sutakiki	LOI	11 April 2013	11 April 2014	Guadalcanal Province	Surface Prospecting	43.8	Au, Cu, Ag, Pb Zn	Expired
	Central	LOI	11 April 2013	11 April 2014	Guadalcanal Province	Surface Prospecting	82	Au, Cu, Ag, Pb Zn	Expired
Guadalcanal Exploration (GEX)	Kuma	PL 02/18	26 July 2018	26 July 2021	Guadalcanal Province	Surface Prospecting	80		Valid
Axiom Mining Ltd	Hoilava and Poha	PL 01/14	4 May 2017	4 May 2019	Guadalcanal Province	Surface Prospecting	485		Valid
	West Guadalcanal	LOI	8 March 2019	8 June 2019	Guadalcanal Province	Surface Prospecting	597		Valid
	Tenement D (Isabel Region)	Tenement D (Isabel Region)	8 March 2019	8 Nov 2019	Isabel Province	Surface Prospecting	145.1	Nickel & Cobalt	Valid
	San Jorge (Bungusule Land)	PL 01/15	13 March 2015	13 March 2018	Isabel Province	Surface Prospecting	35.9812	Nickel & Cobalt	see Mining Lease Tab
Linc Cooperation Ltd	Rendova	PL 05/17	23 November 2017	23rd Nov 2020	Western Province	Surface Prospecting	463.1	Bauxite	Valid
	Khohingo	PL02/16	6 July 2016	6 July 2019	Western Province	Surface Prospecting	138.5	Bauxite	Valid
Solomon Island Gold Pty Limited	Vangunu	PL 03/16	15 Augu 2016	15 Aug 2019	Western Province	Prospecting License	38	All Minerals	Valid
New Asia Mining Ltd	Ghauvale	PL 06/17	21 November 2017	21 Nov 2020	Guadalcanal Province	Prospecting License	283	All Minerals	Valid
Solomon Resources Ltd	Mbalasuna	PL 06/16	12 December 2016	12 Dec 2019	Guadalcanal Province	Surface Prospecting	152	All minerals	Show Cause issued
	Mbarande	PL 05/16	12 December 2016	12 Dec 2019	Guadalcanal Province	Surface Prospecting	438	All minerals	Show Cause issued
Win Win Investment Solomon Ltd	Tuararana area	PL 01/17	12 May 2017	12 May 2020	Guadalcanal Province	Prospecting License	46	All minerals	Valid
	Fauro Island	PL 07/18	27 November 2018	27 Nov 2021	Western Province	Prospecting License	92	All Minerals	Valid
Sunshine Minerals Ltd	Tausere Prospect	PL 02/17	6 March 2017	6 March 2020	Choiseul Province	Prospecting License	510	Bauxite and other minerals	Show Cause issued
Sunshine Nickel Ltd	Jejevo	PL 01/18	9 July 2018	9 July 2021	Isabel Province	Prospecting License	136	Nickel and Cobalt	Valid
Australian Pacific Bauxite Pty Ltd	South West New Georgia	PL 04/17	20 June 2017	20 June 2020	Western Province	Prospecting License	252.9	Bauxite and other minerals	Valid
Island Bauxite Company Ltd	Mt Talaevodo	LOI	8 March 2019	8 Nov 2019	Choiseul Province	Prospecting License	96	Bauxite and other minerals	Valid
	Northern Bugotu-Gao	LOI	8 March 2019	8 Nov 2019	Isabel Province	Prospecting License	129	Bauxite and other minerals	Valid
Solomon Island Mining Company Ltd	Siruka	PL 03/18	20 Sep 2018	20 Sep 2021	Choiseul Province	Prospecting License	186	All Minerals	Valid
Bewilna Exploration Pty Ltd	South East Vella La Vella	PL 04/18	21 Sep 2018	21 Sep 2021	Western Province	Prospecting License	144	All Minerals	Valid
Bintan Mining (SI) Ltd	Central Isabel Region	PL04/19	31 January 2019	30 Jan 2022	Isabel Province	Prospecting License		All Minerals	Valid
ExSol (SI) Ltd	Tirua	PL03/19	31 January 2019	30 Jan 2022	Western Province	Prospecting License	262	All Minerals	Valid
Winning Resources Ltd	West Rennell	PL01/19	17 January 2019	16 Jan 2022	Rennell and Bellona Province	Prospecting License	12	Bauxite and other minerals	Valid
Solomon Island Resources Company Ltd	Isabel	PL02/19	25 January 2019	25 Jan 2022	Isabel Province	Prospecting License	19	Nickel and Cobalt	Valid
Kolosori Nickel (SI) Ltd	Isabel	PL05/19	1 February 2019	1 Feb 2022	Isabel Province	Prospecting License	18	Nickel and Cobalt	Valid
Bintan Mining (SI) Ltd	South East San Jorge	PL06/19	8 March 2019	7 March 2022	Isabel Province	Prospecting License	116	Nickel and Cobalt	Valid





**FIGURE 5.10.** Solomon Islands Resources Company (SIRC) at Kolosori, Santa Isabel. © Dr Tim Grice.

## Response and recommendations

Although mining is currently limited to one site, the evident interest in prospecting shows the potential for expansion in future. There needs to be a strong regulatory regime to address environmental effects, along with a coordinated approach among government agencies. There is also a lack of capacity in relation to testing/laboratory facilities. Specific recommendations are:

- Review Mines and Mineral Act: need to involve landowners and be harmonised with the Environment Act.
- Prepare village disaster risk plans with simulation exercises for communities living downstream from the tailing dam.
- Strengthen laboratories with sufficient equipment for testing to meet international standards.
- Develop environment standards to address mining operations environment discharges.
- Strengthen public hearing process in all mining operations as required under the EIA process.
- Strengthen capacities of mining regulators in monitoring and enforcement.
- Strengthen awareness on mining approval process with resources owners.
- Develop Mining EIA Guidelines. This is to reflect the EIA process for mining up to the stage of mining operation closure which covers post-mining rehabilitation.

## References

Turton S. (2014). East Rennell World Heritage Area Assessment of the State of Conservation of World Heritage Values Project Final Field Report (6 January, 2014).


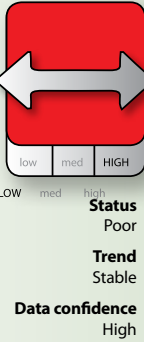
**THEME 6 BIODIVERSITY**



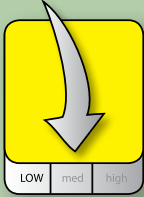
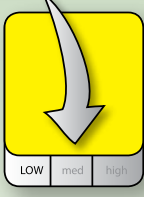
## THEME 6 BIODIVERSITY

The biodiversity of Solomon Islands is of global significance and is listed in the 'Global 200' of the world's most outstanding ecoregions for biodiversity. One of the main reasons for this listing is that the Solomon Islands have globally significant levels of endemism, including 26 of their 47 native mammal species and 19 of 80 reptile species being found nowhere else on earth. The Solomon Islands is also a global centre of bird endemism and the 'Solomon group' is one of 76 Endemic Bird Area's (EBAs) identified by Birdlife International as being of critical importance for global bird conservation. The outstanding biodiversity values are at risk from a range of factors but particularly poorly regulated logging of lowland rainforest.

BIODIVERSITY HIGHLIGHTS

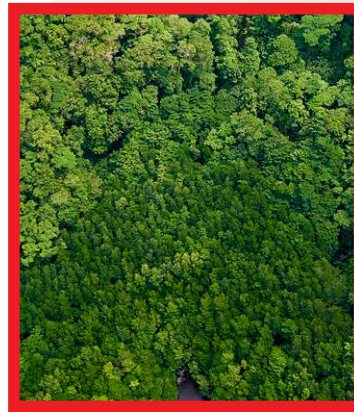
INDICATOR	STATUS AND TREND	KEY FINDINGS	RESPONSE AND RECOMMENDATIONS
<p>INVASIVE SPECIES</p>	 <p><b>Status</b> Poor</p> <p><b>Trend</b> Deteriorating</p> <p><b>Data confidence</b> Low</p>	<p>There are a large number of invasive species in the Solomon Islands, many of which have adverse effects on the environment and economy.</p> <p>A new biotype of coconut rhinoceros beetle is an imminent threat to the livelihoods and economy of Solomon Islands which is reliant on coconut, oil palm and local palms.</p>	<p>Support passage and implementation of the Biosecurity Bill (2013).</p> <p>Develop and implement an invasive species national strategy under the Biosecurity Act.</p> <p>Support implementation of the programme of actions set out in the NBSAP (Target 10, Actions 10.A.-C.).</p>
<p>TERRESTRIAL AREAS MANAGED FOR CONSERVATION</p>	 <p><b>Status</b> Poor</p> <p><b>Trend</b> Stable</p> <p><b>Data confidence</b> High</p>	<p>Currently some forest areas are being managed and protected by communities or tribal groups but are not legally protected against logging and mining developments.</p> <p>In some cases, provinces and national agencies have forest areas that are formally managed under their respective mandates.</p> <p>Records show that at least 3% of the Solomon Islands land area is managed for conservation but not formally protected.</p> <p>By 2018 no terrestrial area had been formally protected for conservation under the PA Act 2010.</p> <p>The SI Code of Logging Practice 2002 prohibits felling activities on buffer areas and 400 meters above sea level, however compliance to these codes are limited.</p>	<p>Implement relevant NBSAP targets relating to protected areas, including the target of 10% terrestrial area protected by 2020 (Target 12; Actions A.- F.).</p> <p>Support the establishment and declaration of terrestrial protected areas under the Protected Areas Act 2010, FTRU Act and other national legislation or ordinances that promote terrestrial protected/conservation areas.</p> <p>Establish protected area network based on the Key Biodiversity Areas, ecologically and biologically significant Areas.</p> <p>Implement the GEF5 and proposed GEF6 Projects which promote sustainable land-use planning, sustainable forestry management and the establishment and management of protected areas.</p> <p>Review and update the Protected Areas Act 2010 and its regulations (2012) to address gaps in enforcement (fines, incentives for rangers/inspectors and management committees).</p> <p>Promote sustainable land-use planning at national, provincial and community level.</p> <p>Enforce (and update/revise) Town and Country Planning Act.</p>

BIODIVERSITY HIGHLIGHTS

INDICATOR	STATUS AND TREND	KEY FINDINGS	RESPONSE AND RECOMMENDATIONS
<p><b>THREATENED AND ENDEMIC TERRESTRIAL SPECIES</b></p>	 <p><b>Status</b> Fair</p> <p><b>Trend</b> Deteriorating</p> <p><b>Data confidence</b> Low</p>	<p>Solomon Islands have globally significant levels of biological endemism.</p> <p>24 birds and 16 mammal species are on the IUCN Red List.</p> <p>Logging is one of the most eminent threats to biodiversity in the Solomon Islands. Other threats include subsistence/commercial farming, mining developments and species being targeted for local consumption.</p>	<p>Establish and manage terrestrial protected areas, particularly in lowland rainforest, under the Protected Areas Act 2010.</p> <p>Implement education actions outlined in the NBSAP under 'Theme 2: Species conservation'.</p> <p>Implement invasive species management outlined in the NBSAP under 'Theme 4: Management of invasive species and genetically modified organism'.</p> <p>Develop, promote and support implementation of threatened and endangered species conservation and management programmes.</p> <p>Establish monitoring programmes for priority threatened species.</p> <p>Promote sedentary farming practices e.g. organic farming.</p> <p>Enforce the Wildlife Protection and Management Act (Amendment 2017).</p>
<p><b>FOREST COVER</b></p>	 <p><b>Status</b> Fair</p> <p><b>Trend</b> Deteriorating</p> <p><b>Data confidence</b> Low</p>	<p>Forest accounted for approximately 90% of the Solomon Islands land area in 2016, with 55% of this area undisturbed.</p> <p>Annual tree cover loss in the Solomon Islands has increased dramatically between 2001 and 2017, particularly 2013–2017.</p>	<p>Improve environmental governance in forestry to ensure sustainability of hardwood industry.</p> <p>Enforcement and alignment of Forestry Act and Environment Act.</p> <p>Work towards reviewing the Forestry Act.</p> <p>Discourage expansion of logging outside of approved 'logging concession areas' without further assessment.</p> <p>Work towards NBSAP target of 10% terrestrial area protected by 2020.</p> <p>Implement REDD+ activities.</p> <p>Strengthen EIA for the forestry sector.</p> <p>Revise Environment Act and its regulations (EIA, monitoring of forestry developments and enforcement).</p> <p>Harmonise natural resource legislation for protection of the forest (environment sensitive).</p> <p>Promote polluter-pays based policies.</p> <p>Expand forest rehabilitation, re-forestation and enrichment planting to enhance forest carbon stocks.</p> <p>Promote downstream processing of timber and ban round-log exports.</p>



Spread of invasive species reported and proportion of invasive species under formal control.



**Status**  
Poor

**Trend**  
Deteriorating

**Data confidence**  
Low



### Status and trend discussion

There are a large number of invasive species in the Solomon Islands, many of which have adverse effects on the environment as well as economic and other costs. Records show a total of over 450 invasive plants, of which 110 are described as being ‘highly invasive’ (List of invasive plants finalised with PLD-2015 SGM).

### COCONUT RHINOCEROS BEETLE

A new biotype of coconut rhinoceros beetle (CRB), *Oryctes rhinoceros*, is an imminent threat to the livelihoods and economy of Pacific Islanders reliant on coconut, oil palm and other palms. The new biotype, known as CRB-Guam was first discovered in Guam in 2007. Further invasions by the same biotype have been recorded on the Papua New Guinea mainland (2009), Hawaii (2014), Palau (2014) and Solomon Islands (2015). The CRB-Guam biotype causes severe to catastrophic levels of damage (50–90 %) as compared to the CRB-Pacific biotype which, with virus biocontrol, only causes light to moderate damage (10–50%) in ‘hot spots’ of uncontrolled breeding sites. The CRB has a long life cycle of about 180 days. The adult beetles can live up to 9 months and within that period cause damage by chewing into the growing shoot of the palms, which results in the V-shape notches on the leaves after they unfurl (this can be up to 4 months after the damage has been caused). Intensive feeding damage can cause eventual death to the palms. The immature stages (i.e. grubs) of the beetle feed on compost materials. CRB can fly to spread throughout islands, but dispersal between islands depends on human mediated activities. Soil and plant materials can contain the immature life stages of the beetle. The beetles are

attracted to light from boats and planes, which can then transport them to new locations. Other palms are also affected including oil palm, betel nut, sago and royal palms. Attacks on these will have a range of effects but the most serious will be on oil palm as this provides livelihoods for thousands of people and SI\$150–200 million in export earnings (<http://www.biosecurity.gov.sb/News-Resources/crb-response-press-release-4-2018>; An emerging biotype of Coconut Rhinoceros Beetle Discovered in the Pacific: <https://ird.spc.int/focus-areas/biosecurity-and-trade/24/the-pacific-communitys-biosecurity-team-conducts-pest-information-system-training-for-cook-islands>).

## FIRE ANTS

Several genera of invasive ant species continue to spread throughout the Pacific. These ant species adversely impact upon the environment, the economy, and human health. The impacts of the little fire ant (*Wasmannia auropunctata*) on the native biota and subsistence agriculture in the Solomon Islands are poorly understood. This species was originally introduced as a biological control against nut-fall bugs (*Amblyopelta* sp.) around 30 years ago and in the intervening time has spread throughout the Solomon Islands, aided by movement of produce and planting material. It is now itself a major pest of coconut, cocoa and subsistence agriculture. The presence and abundance of little fire ants has the potential to inflict considerable crop loss in rural subsistence gardens in the Solomon Islands. The presence of the little fire ant also affects gardening activities because its sting is a nuisance to farmers in their garden plots. As a result, the presence of the ant reduces time spent working effectively, influences decisions about where to make gardening plots, discourages children's participation, and changes traditional gardening practices (Fasi et al. 2013).

## GIANT AFRICAN LAND SNAIL

The giant African land snail (*Lissachatina fulica*) is one of the world's most destructive pests of fruit and vegetables. It is known to eat around 500 species of plants including cocoa, papaya, peanut, rubber trees and most varieties of beans, peas, cucumbers and melons. Giant African land snail originated in East Africa and is now present on most Pacific and Indian Ocean islands. It has serious adverse impact on agriculture, human health and native fauna: once established this snail is impossible to eradicate. The Giant African Land snail is well established around Honiara and spreading. Vectors for its introduction include logging machinery, ship containers and transportation of adults and eggs via vegetables from areas where the snail is established.

## RATS

The invasive black rat (*Rattus rattus*) was introduced to the Solomon Islands and is now established. This arboreal species is among the most widespread invasive vertebrates on islands and continents and can survive in both built-up and forested areas. The species is typically the most

common invasive rodent in insular forests. Few vertebrates are more problematic to island biota and human livelihoods than this species and it damages crops and stored foods, kills native species, and serves as a vector for human diseases. Rats pose a significant threat to the endemic birds and also pose a threat to human food security, as they are known to eat a range of crops.

## Impact

Invasive species have negative effects on ecosystems and human wellbeing. They also impose costly damage to crop production including subsistence agriculture for food security, the domestic production of cash crops for sale within and between communities, and export crops. For example, coconut rhinoceros beetles threaten the copra industry which is estimated to provide 300–400 million SBD in export value (in the form of raw copra, copra and virgin oil, and copra by-products). Coconuts also support income from domestic sales or local sale of coconut products.

The case studies show that invasive species also directly threaten biodiversity in Solomon Islands (e.g. the effects of rats on bird populations) as well as human health and wellbeing.

## Response and recommendations

Solomon Islands is a Party to the International Plant Protection Convention and a member of the Pacific Plant Protection Organisation (PPPO) - these entities support biosecurity internationally and in the Pacific Islands region respectively. Effective biosecurity controls are essential for protecting subsistence agriculture for food security, and the natural environment and biodiversity which are fundamental to Solomon Islands tourism and log export industries.

Biosecurity Solomon Islands (BSI) has the role of protecting the country against biosecurity risks, however it has limited resources for the range of biosecurity challenges, including border control, research, and responding to biosecurity incursions (including eradicating pests and diseases). A Biosecurity Bill (2013) enabling border control activities, quarantine and management of biosecurity emergencies, has yet to be passed.

The Solomon Islands Agriculture and Livestock Sector Policy 2015–2019 highlights the need for certain regulatory services including:

- Protection of natural environment and sustainable management of land use.
- Biosafety regulations with respect to genetically modified (GM) plants, animals and GM food.
- Biosecurity Regulation with respect to pests and disease control and appropriate quarantine border control measures.
- Verification and certification of seeds and plant propagation materials and registration and regulation of agrochemical use.

- Inspection services and issuance of sanitary and phytosanitary standard (SPS) certificates, and verification and certification that products satisfy relevant standards, and quality and labelling requirements.

These services need to be fully resourced to address priority biosecurity risks/invasive species

The National Biodiversity Strategic Action Plan 2016–2020 sets out a number of actions to address invasive species under NBSAP Target 10:

By 2020, invasive alien species and their pathways have been identified, and measures are in place to control the potential entry of invasive species, and develop and adopt an implementation plan to control or eradicate current invasive species that are threatening food security, trade and people's health.

The key action under Target 10 is the development of a national strategy under the Biosecurity Act to:

- Control and eradicate invasive species.

- Develop strategies to address specific invasive pests.
- Strengthen border control.

Key recommendations include:

- Support passage and implementation of the Biosecurity Bill (2013) .
- Develop and implement an invasive species national strategy under the Biosecurity Act.
- Support implementation of the programme of actions set out in the NBSAP (Target 10, Actions 10.A.-C.) and through Biosecurity Solomon Islands.
- EIA EMPs need to be monitored and penalised.
- Education and Awareness.

## References

Fasi, J., Brodie, G.D., and Vanderwoude, C. (2013). Increases in crop pests caused by *Wasmannia auropunctata* in Solomon Islands subsistence gardens. *Journal of Applied Entomology* 137, 580–588.



Photo © Stuart Chape



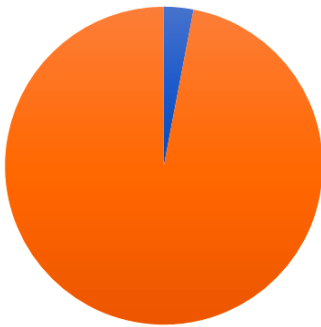


## TERRESTRIAL AREAS MANAGED FOR CONSERVATION

Area of established terrestrial protected areas managed for conservation. This includes a range of areas with different protection status, including community managed areas that are compatible with sustainable harvest.

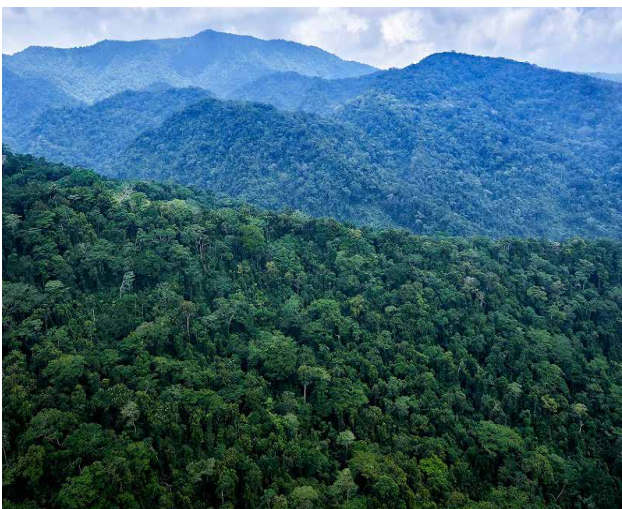
### DEFINITIONS: STATUS OF PROTECTED AREAS

- **Proposed:** in a process to gain recognition or dedication through legal or other effective means.
- **Designated:** recognised or dedicated through legal means. Implies specific binding commitment to conservation in the long term.
- **Established:** recognised or dedicated through other effective means. Implies commitment to conservation outcomes in the long term, but not necessarily with legal recognition.

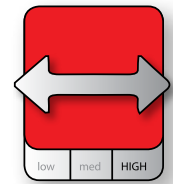


■ Area managed for conservation ■ Area not managed for conservation

**FIGURE 6.1.** Area managed and not managed for terrestrial conservation in the Solomon Islands (MECDM).



**FIGURE 6.2.** There are currently no formal terrestrial protected areas in the Solomon Islands. © Stuart Chape.



**Status**  
Poor

**Trend**  
Stable

**Data confidence**  
High



### Status and trend discussion

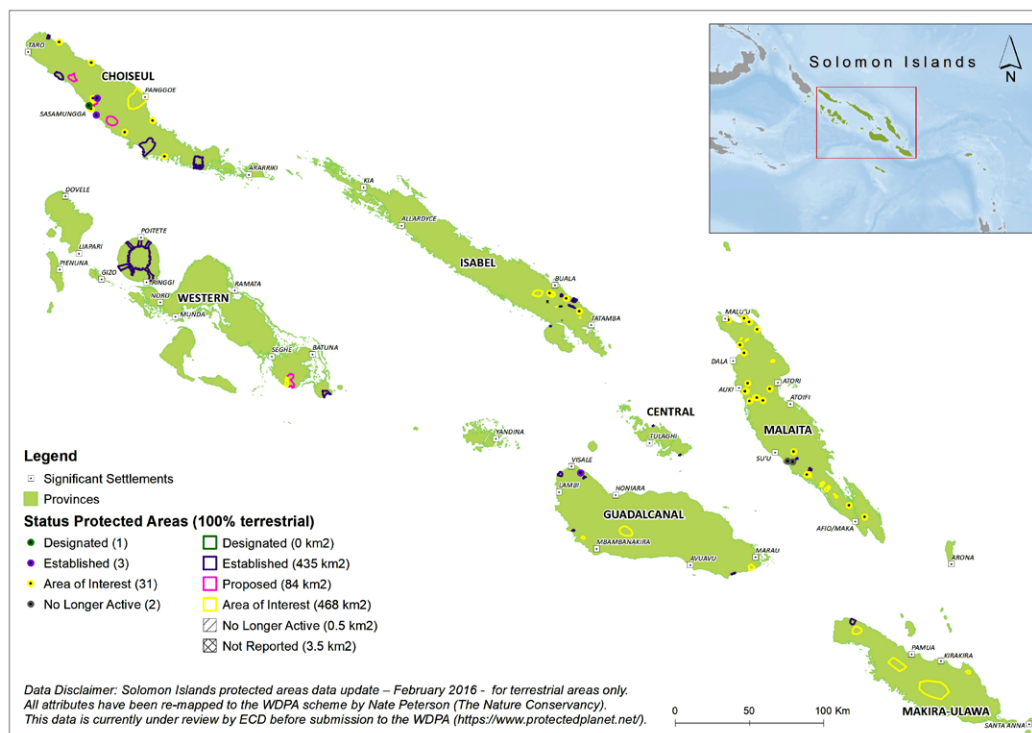
There are no terrestrial areas currently formally protected under Solomon Islands legislation (i.e. 0% of land area protected; Figures 6.1, 6.2). However, a number of sites are managed in a way that protects conservation values under less formal arrangements and together these comprise 3% of the land area (Figures 6.1, 6.3). This 3% of land area is 7% less than the targets set out in the NBSAP. Several new community managed protected areas have applications underway for formal listing under the Protected Areas Act 2010. One of the areas is the East Rennell World Heritage site, currently in the process of being adopted under the Protected Areas Act 2010. The key risks to the site are the possible impact of logging and invasive species. Queen Elizabeth National Park west of Honiara was declared under an old Act, but is not currently managed as a protected area.

### Impact

Protected areas are a key means of reducing risks and avoiding adverse impacts on biodiversity and other values, including:

- Erosion and water contamination through silt runoff.
- Loss of ecotourism opportunities.
- Declines and extinctions of threatened and endemic species.
- Loss of ecosystems services.
- Biodiversity loss.





**FIGURE 6.3.** Terrestrial protected areas of Solomon Islands (status 2016).

## Response and recommendations

The Protected Areas Act allows communities to become involved in protecting areas of their land (or sea) for current and future generations. This involves conserving nature and wildlife and helping support the sustainable use of resources to meet the livelihood needs of local communities and customary owners. (How to protect areas on your land and sea under the Protected Areas Act 2010 (Solomon Islands) (<https://pipap.sprep.org/content/how-protect-areas-your-land-and-sea-under-protected-areas-act-2010-solomon-islands>)).

The National Biodiversity Strategic Action Plan 2016–2020 sets out a number of actions to protect ecosystems under NBSAP Target 12: By 2020, at least 10 percent of the terrestrial and inland water, and 15 percent of coastal and marine areas of the Solomon Islands are protected and managed effectively, enabling an ecological, representative and well-connected system of protected areas, and has been integrated into the wider island and seascape management initiatives.

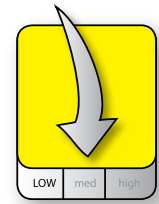
### Summary of specific recommendations:

- Implement relevant NBSAP targets relating to protected areas; including the target of 10% terrestrial area protected by 2020 (Target 12; Actions A.- F.)
- Implement the GEF5 and proposed GEF6 Projects which promote sustainable land-use planning, sustainable forestry management and the establishment and management of protected areas.
- GEF5 target of 5% terrestrial area protected as contribution to the NBSAP target of 10%.

- GEF6 target of 2% terrestrial area protected as contribution to the NBSAP target of 10%.
- Complete and submit protected areas roadmap to CBD.
- Establish protected area network based on Key Biodiversity Areas and Ecologically and Biologically Significant Areas (EBSAs), Key Biodiversity Areas (KBAs), and Important Bird and Biodiversity Areas (IBAs).
- Increased funding for management of protected areas (e.g. local rangers).
- Promote the use of Provincial ordinance for establishing local protected areas.
- Identify climate adaptation priority sites in the National Adaptation Plan being developed.
- Review and update the Protected Areas Act 2010 and its regulations (2012) to address gaps in enforcement (fines, incentives for rangers/inspectors and management committees).
- Support the establishment and declaration of terrestrial protected areas under the Protected Areas Act 2010, FTRU Act and other national legislation or ordinances that promote terrestrial protected/conservation areas.
- Promote sustainable land-use planning at national, provincial and community level.
- Enforce (and update/revise) Town and Country Planning Act.
- Community incentives for protection and financing.
- Capacity to enforce community rules.
- Implementation of GEF 5 and 6.

## THREATENED AND ENDEMIC TERRESTRIAL SPECIES

Threatened species are determined as having an elevated risk of extinction. The International Union for Conservation of Nature (IUCN) uses criteria to evaluate whether species are threatened. Threatened species may require management intervention to prevent their extinction. Monitoring threatened species populations over time is the best means of determining status and trends. Endemic species are restricted to one country or region and are often threatened due to their limited distribution and inability to move into new habitats.



**Status**  
Fair  
**Trend**  
Deteriorating  
**Data confidence**  
Low

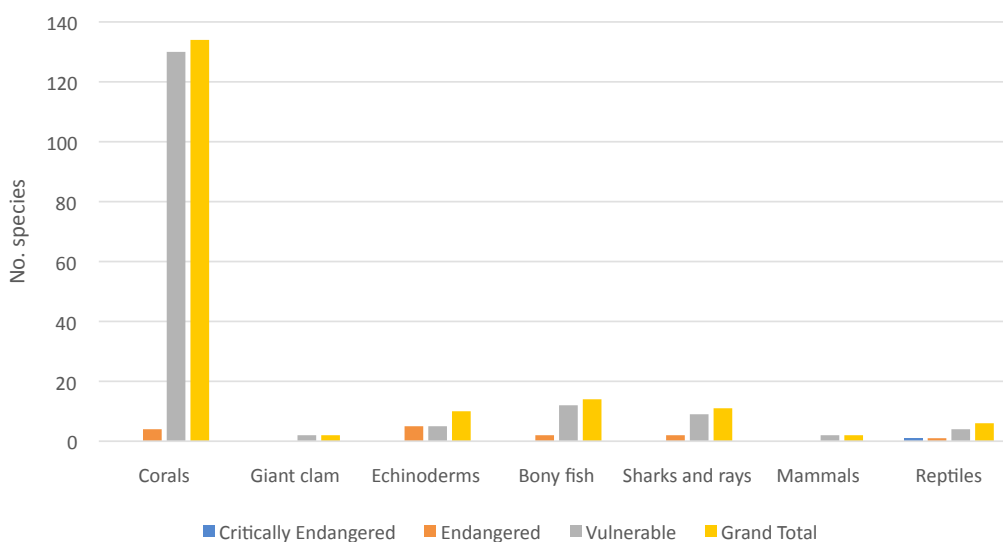


### Status and trend discussion

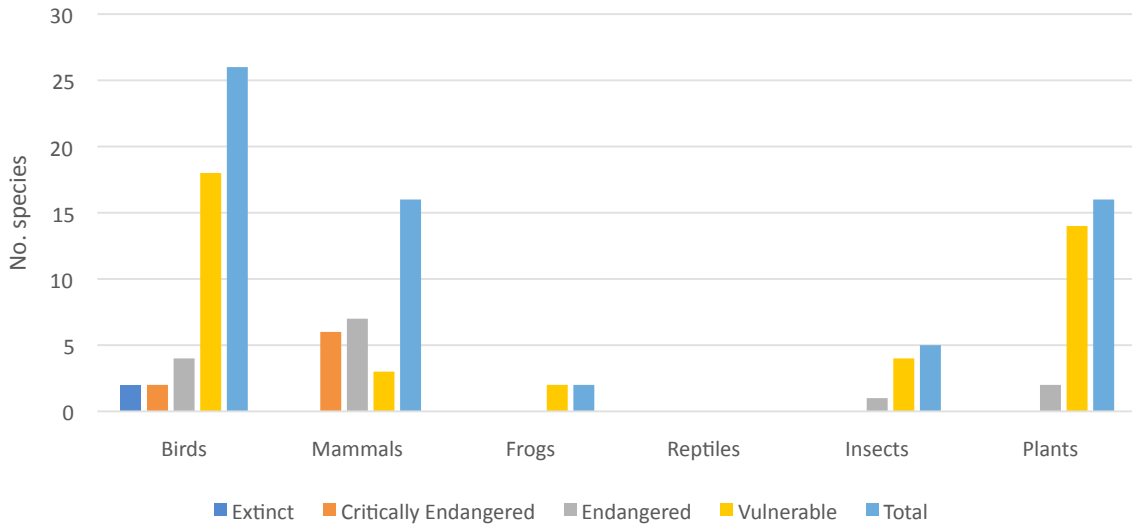
In 2002, the World Wide Fund for Nature (WWF) listed the wet forests of the Solomon Islands in their ‘Global 200’ – 238 of the world’s most outstanding ecoregions for biodiversity (Olsen and Dinerstein 2002). One of the main reasons for this listing is that the Solomon Islands has globally significant levels of endemism, including 26 of their 47 native mammal species and 19 of 80 reptile species being found nowhere else on earth. Notably, the Solomon Islands are also a global centre of bird endemism and the ‘Solomon group’ is one of 76 Endemic Bird Area’s (EBAs) identified by Birdlife International as being of critical importance for global bird conservation (Stattersfield et

al. 1998). The EBA status is based on the high levels of endemism (at least seven endemic genera and 90 endemic species), a high proportion of restricted-range species, and high threat levels (Stattersfield et al. 1998). Makira Island and the New Georgia group support the highest number of endemic birds, with 12 and 10 species, respectively. The Solomon Islands also support about 4500 species plants and are a hotspot for endemic palms, orchids and climbing pandanus (MECDM 2008).

The EBA status of the Solomon Islands is reflected in the IUCN Red List with birds featuring prominently, including 24 extant threatened species and two extinct species (Figure 6.4). Habitat loss through commercial and local logging, and



**FIGURE 6.4.** IUCN Red-List terrestrial threatened species and their status in the Solomon Islands.



**FIGURE 6.5.** Major threats to IUCN Red-List terrestrial threatened species in the Solomon Islands. Note that insects are not included because major threats are not listed for most species.

through clearing for agriculture, is the most important threat to birds in the Solomon Islands (Figure 6.5). Invasive species (including cats, rats, pigs and fire ants), hunting and mining are also significant threats (Figure 6.5). The Solomon Island’s 16 threatened terrestrial mammal species comprise 10 bats and 6 rodents (Figure 6.4). The dominant threats to these mammals are habitat loss through logging and clearing, hunting and invasive species (Figure 6.5). No terrestrial reptiles are listed as threatened on the IUCN Red List (Figure 6.4), however several species have not yet been assessed (including the iconic CITES listed Solomon Islands skink *Corucia zebrata*). The major threat to the two threatened frog species in the Solomon Islands is habitat loss (Figures 6.5, 6.6). Five butterfly species are the only threatened terrestrial arthropods listed for the Solomon Islands (Figure 6.4), reflecting the lack of taxonomic research and conservation assessment for this phylum. Information on major threats are lacking for three of the five threatened butterfly species. Plants are similarly under-represented on the IUCN Red List (16 species; Figure 6.4) and the true number of plant species qualifying as threatened will only be revealed through further taxonomic research and conservation assessment. Logging and clearing are the major threat to the Solomon Islands plants, which include several hardwood tree species targeted for timber (Figure 6.4).

The Solomon Islands Archipelago is part of the ‘East Melanesian Islands Hotspot’, one of the most geographically complex areas on Earth, with diverse islands of varying age and geology. Isolation and adaptive radiation have led to very high levels of endemism, both within the hotspot as a whole and on single islands. The Solomon Islands Rainforests are true oceanic islands with high vertebrate endemism, including single-island endemics, restricted-range mammals, and an astounding 69 bird species found nowhere else in the world. Nine Key Biodiversity Areas have been selected in the Solomon Islands.

There are currently no monitoring programmes in place for terrestrial threatened species in the Solomon Islands.



**FIGURE 6.6.** Treefrog in Guadalcanal (Peter McDonald/SPREP).

### Impact

The globally high levels of endemism in the terrestrial biota of the Solomon Islands have been shaped through a combination of the islands position in the Pacific (close to PNG) and millions of years of isolation. Some of this vast biological ‘wealth’ is already lost, including at least two bird species and probably at least three mammal species. Without intervention many additional species face a genuine risk of extinction in the coming years. Importantly, some threatened species have ecological roles that will not be fulfilled if they become extinct; for example, pigeons, doves, fruit bats are excellent seed dispersers. The loss of culturally significant species would also affect the persistence of cultural practices.

## Response and recommendations

The single most important threat to terrestrial biodiversity in the Solomon Islands is habitat loss associated with logging and clearing for agriculture. This threat is heightened by the fact that there is currently no strategic protected area network across the Solomon Islands. Protected area spatial planning, similar to land-use planning can be used to identify networks of sites that collectively includes a suite of biodiversity features (e.g. levels of endemism) with minimal displacement of human interests. A legislative mechanism for protected area declaration now exists - the Solomon Islands Government passed the Protected Areas Act 2010 for the purposes of establishing, managing and promoting protected areas in the Solomon Islands. The Act addressed the lack of a national legal mechanism for protecting land areas from incompatible uses, such as logging and mining and also met a key objective under 'Theme 3: Protected area system' of the Solomon Islands National Biodiversity Strategic Action Plan (Government of Solomon Islands 2009). Importantly, the consent of customary landowners is required before a declaration for a protected area can be made, and management committees for these areas can include landowners.

Hunting is another important threat to biodiversity, particularly for birds and mammals. Education is the key to addressing this threat and for raising the awareness of the plight of threatened species where they are hunted. Actions on education are outlined in the NBSAP under 'Theme 2: Species conservation' (Government of Solomon Islands 2009). Progress on these actions should be evaluated and priority areas for education determined.

The third major threat to biodiversity, again principally for threatened birds and mammals, is invasive species. Among the most serious invasive species are the Pacific rat (*Rattus exulans*), cat (*Felis catus*), fire ants, and crazy ants. Priority should be given to maintaining the

rat, cat, and/or invasive ant-free status of islands where these threatened species occur; for example, the cat and rat-free Tinakula Island, which supports a population of the endangered Santa Cruz Ground-dove (*Alopecoenas sanctaerucis*) (Pierce 2014). Actions on invasive species are outlined in the NBSAP under 'Theme 4: Management of invasive species and genetically modified organism' (Government of Solomon Islands 2009).

Monitoring programmes for priority threatened species should be established in Solomon Islands. Without such programmes, and the ability to determine population trends over time, it will not be possible to measure the effectiveness of any management and education programmes.

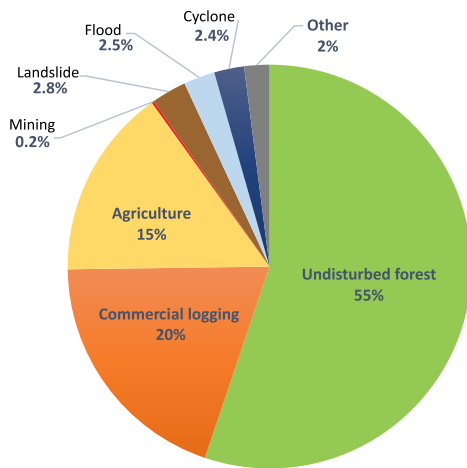
## References

- Government of Solomon Islands (2009). *Solomon Islands National Biodiversity Strategic Action Plan*. Ministry of Environment Conservation and Meteorology, Honiara.
- MECDM (2008). *Solomon Islands State of Environment Report 2008*. Ministry of Environment, Climate Change and Meteorology, Honiara.
- Olson, D.M. and Dinerstein, E. (2002). The Global 200: Priority ecoregions for global conservation. *Annals of the Missouri Botanical garden*, pp.199–224.
- Pierce, R. (2014). Surveys of threatened birds and flying foxes in the Santa Cruz Islands, Solmon Islands, Sep – October 2014.
- Stattersfield, A.J., Crosby, M.J., Long, A.J. and Wege, D.C. (1998).** *Endemic Bird Areas of the World. Priorities for biodiversity conservation. BirdLife Conservation Series 7. Cambridge, BirdLife International.*
- WWF (no date). Solomon Islands, east of New Guinea. <https://www.worldwildlife.org/ecoregions/aa0119>, accessed 8/10/2018.
- CEPF Ecosystem Profile: East Melanesian Islands Biodiversity Spots, 2011&Summary 2012 (<https://www.cepf.net/>).

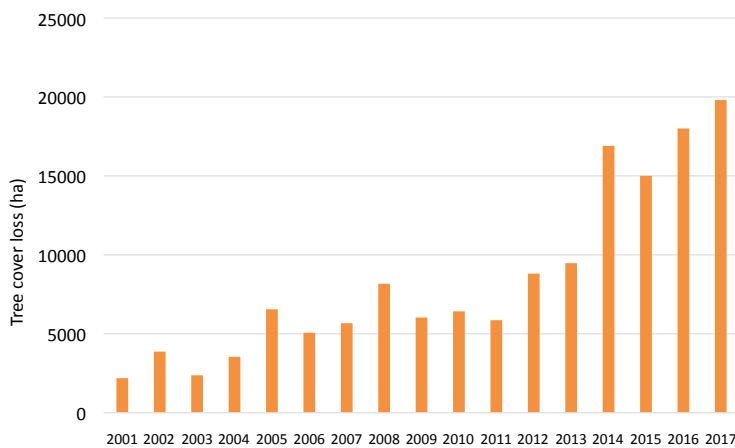


Photo © Stuart Chape

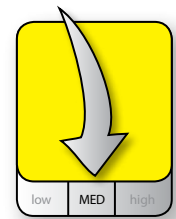
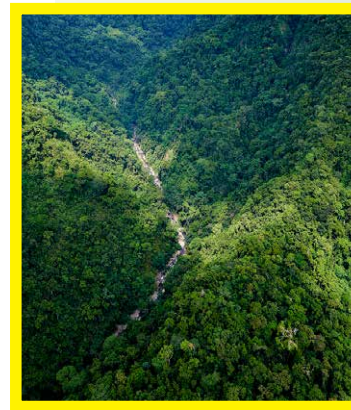
Tracking change in forest cover over time.



**FIGURE 6.7.** Disturbances to the total forested area (90%) of the Solomon Islands in 2016 (The Forest and land use composition of the Solomon Islands study 2016).



**FIGURE 6.8.** Annual tree cover loss in the Solomon Islands 2001–2017 ([www.globalforestwatch.org](http://www.globalforestwatch.org)).



**Status**  
Fair

**Trend**  
Mixed

**Data confidence**  
Medium



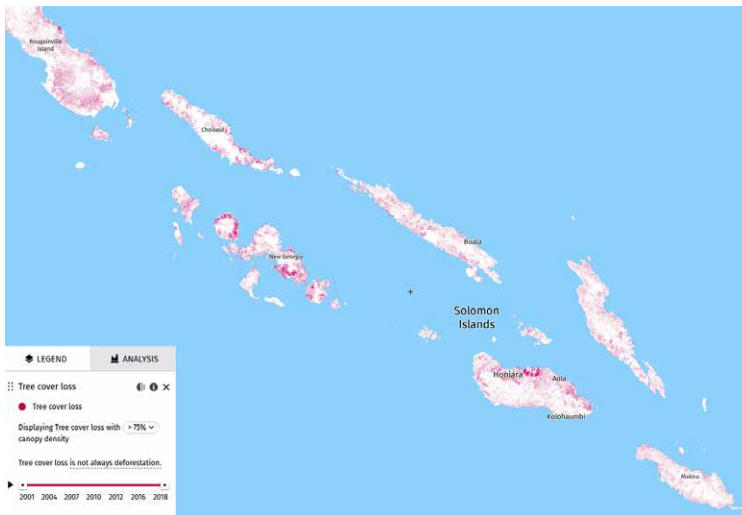
### Status and trend discussion

Forest accounted for approximately 90% of the Solomon Islands land area in 2016 (Figure 6.7). However, only 55% of this area was undisturbed, with 20% disturbed by commercial logging and 15% disturbed by agriculture. Independent satellite image analysis by Global Forest Watch shows an increasing trend in the rate of tree cover loss in the Solomon Islands between 2001 and 2017, particularly from 2013–2017 (Figures 6.8–6.10).

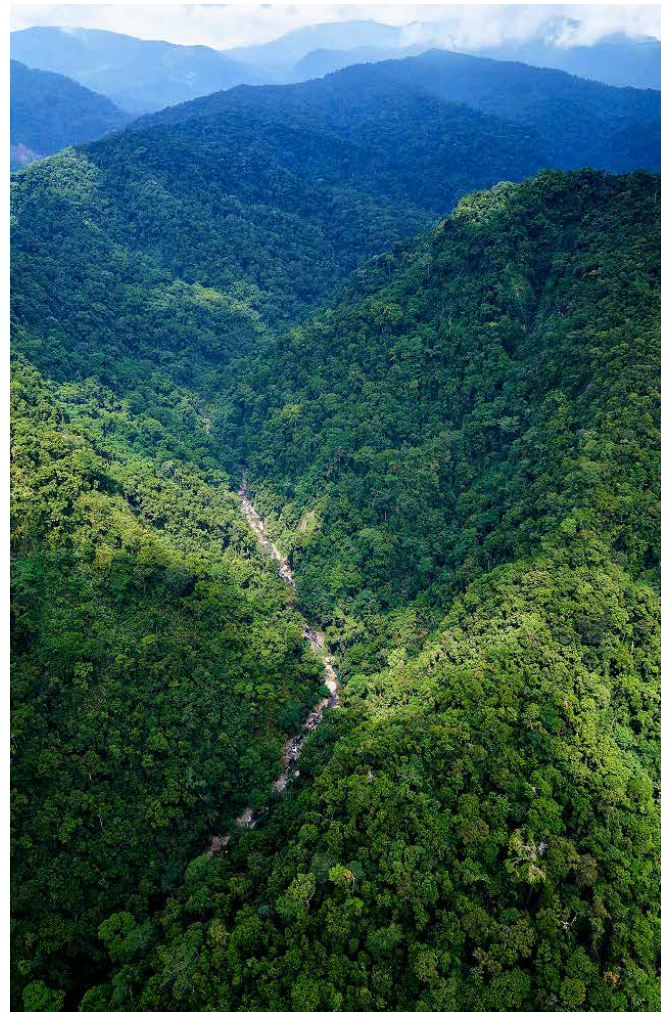
### Impact

The figures above show that approximately 40% of forest land has been ‘disturbed’ or ‘deforested’ over the period 2000–2016 – representing a very significant loss of forest cover over that period. Given the critical role that forest land plays in the functioning of ecosystems and maintenance of biodiversity (Figure 6.11), this represents a major risk in terms of:

- Erosion and water contamination through silt runoff.
- Loss of ecotourism opportunities.
- Loss of habitat – leading to declines and extinctions of threatened and endemic species.
- Loss of ecosystems services.



**FIGURE 6.9.** Tree cover loss in the Solomon Islands 2001–2018, with canopy density >75% ([www.globalforestwatch.org](http://www.globalforestwatch.org)).



**FIGURE 6.11.** Forest in the Ngalimbiu River catchment, Guadalcanal. © Stuart Chape.



**FIGURE 6.10.** Tree cover loss in the Solomon Islands by dominant driver ([www.globalforestwatch.org](http://www.globalforestwatch.org)).

## Response and recommendations

- Protected areas roadmap submitted to CBD.
- Protected area network established based on the Key Biodiversity Areas (KBAs), and Important Bird and Biodiversity Areas (IBAs).
- Improve environmental governance in forestry to ensure sustainability of hardwood industry.
- Enforcement and alignment of Forestry Act and Environment Act.
- Work towards reviewing the Forestry Act.
- Discourage expansion of logging outside of approved ‘logging concession areas’ without further assessment.
- Work towards NBSAP target of 10% terrestrial area protected by 2020.
- Implement REDD+ activities.
- Strengthen EIA for the forestry sector.
- Revise Environment Act and its regulations (EIA, monitoring of forestry developments and enforcement).

- EIA requirements should be incorporated into the Forest Act (or revised version) to reduce impacts of logging activities.
- Harmonise natural resource legislation for protection of the forest (environment sensitive).
- Promote polluter-pays based policies.
- Expand forest rehabilitation, re-forestation and enrichment planting to enhance forest carbon stocks.
- Promote downstream processing of timber and ban round-log exports.

## References

Global Forest Watch (<https://www.globalforestwatch.org/>)

Forest and Land Use Change (2000–2016), 3rd Consultation Workshop on Historical Annual Forest and Land Use Change Assessment and Forest Reference Level in the Solomon Islands (Kitano Mendana Hotel, Honiara, Solomon Islands), July 2018. KedsonAgo FRMTSD (Ministry of Forest and Research) & Oala luda – FAO/NFI PNG.



**THEME 7 BUILT ENVIRONMENT**





## THEME 7 BUILT ENVIRONMENT

Built Environments require special consideration as they are places with the greatest population of people and most intensive human activities. Urban areas concentrate the effects of human habitation, evident through the production of litter and all kinds of waste, use of resources, intensity of trade and industry (including traffic / transport requirements) and expansion of area. These issues are addressed under the various indicators below.

The theme Built Environment refers to human-made environments that provide the setting for human activity, ranging in scale from buildings to parks. According to Wikipedia, the definition of Built Environment is a man-made space which encompasses places or spaces modified by people, or in which people live, work and recreate on

a day to day basis. Built Environment includes buildings, parks and transportation systems ([https://en.wikipedia.org/wiki/Built\\_environment](https://en.wikipedia.org/wiki/Built_environment)).

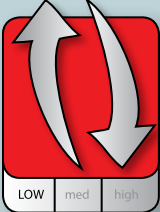

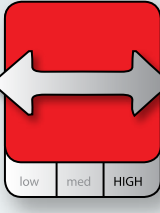

Built Environment are areas which require special consideration as they have the greatest population of people and most intensive human activities. Urban areas concentrate the effects of human habitation, evident through the production of litter and all kinds of waste, use of resources, intensity of trade and industry (including traffic/transport requirements) and expansion of area. Due to these issues, the focus of the theme on Built Environment is defined by the following indicators - waste generated and disposal, energy, sanitation and health under which it will be addressed.



Photo © Stuart Chape



BUILT ENVIRONMENT HIGHLIGHTS

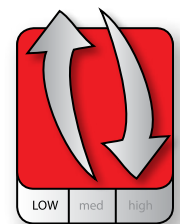
INDICATOR	STATUS AND TREND	KEY FINDINGS	RESPONSE AND RECOMMENDATIONS
<p>WASTE GENERATED AND DISPOSAL</p>	 <p><b>Status</b> Fair</p> <p><b>Trend</b> Mixed</p> <p><b>Data confidence</b> Low</p>	<p>Estimates show a 50% increase in waste generated per person (Honiara) between 1990 (0.62 kg/person/day) and 2017 (0.95 kg/person/day).</p>	<p>Fund and implement National Waste Management and Pollution Control Strategy 2017–2026.</p>
<p>ENERGY</p>	 <p><b>Status</b> Fair</p> <p><b>Trend</b> Unknown</p> <p><b>Data confidence</b> Medium</p>	<p>In 2009 only 15% of the population had access to electricity and the per capita electricity use was 142 kWh.</p>	<p>The Solomon Islands Energy Policy 2014 set out policy-driven targets including:</p> <p>Access to grid-connected electricity in the urban areas increased to 80% by 2020.</p> <p>Access to electricity in rural households and institutions increased to 35% by 2020.</p>
<p>SANITATION</p>	 <p><b>Status</b> Fair</p> <p><b>Trend</b> Stable</p> <p><b>Data confidence</b> High</p>	<p>In 2016 80% of rural households (&gt;300,000 people) used open defecation.</p> <p>In 2016 3% of rural households (~50,000 people) had access to improved sanitation.</p>	<p>RWASH Policy 2014. RWASH Strategic Plan 2015.</p>
<p>HEALTH</p>	 <p><b>Status</b> Fair</p> <p><b>Trend</b> Deteriorating</p> <p><b>Data confidence</b> Medium</p>	<p>The incidence of acute respiratory infection and skin diseases has substantially increased over the period 2013–2017.</p> <p>Large-scale malaria outbreaks continue to occur in the Solomon Islands.</p>	<p>Strengthen awareness of health risks and prevention measures.</p> <p>Improve waste management practices.</p> <p>Make clean energy available and affordable.</p> <p>Build more built spaces for physical activities.</p> <p>In urban areas, increase the amount of green space.</p>

WASTE GENERATED AND DISPOSAL

Tracks volume of waste generated and waste disposal. Target for waste is stable or decreasing and proportion of waste collected by government waste collection services will be increasing.



**FIGURE 7.1.** Bulldozer working at the Ranadi Landfill in Honiara. Gas venting pipes installed at the Landfill made from PVC pipes and locally available materials (© Wendy Beti/ECD 2017).



**Status**  
Fair

**Trend**  
Mixed

**Data confidence**  
Low



Status and trend discussion

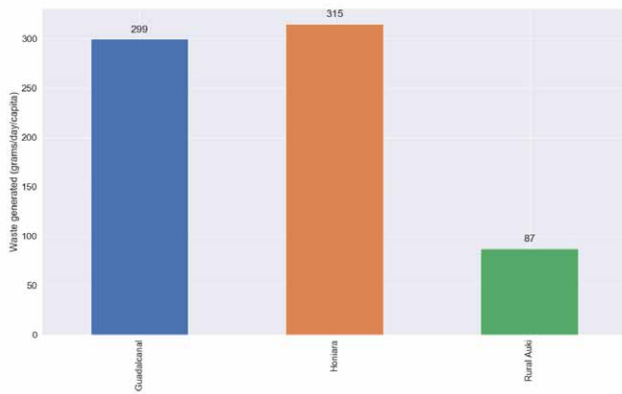
The National Waste Management & Pollution Control Strategy (NWMPC) 2017–2026 identifies the following as the major wastes and pollution streams which includes: Solid wastes, Liquid Wastes, Hazardous and Chemical Wastes, Health-care wastes and E-Wastes to be addressed under the strategy. As part of the country’s obligation to the Stockholm Convention, the National Implementation Plan on Persistent Organic Pollutants 2018 (SINIP) was also developed with the aim of setting the roadmap for management of these pollutants into the future.

Current plans to improve waste management in the provinces includes a Solid Waste Management Plan and landfill operation manual which was already developed for Honiara City through the J-PRISM II Project funded by JICA. There are also plans to support Auki, Tulagi, Kirakira and Buala to develop their waste management plans. Other waste and pollution control related projects funded by various development partners, either completed or in progress, include: Japanese Technical Cooperation Project for Promotion of Regional Initiative on Solid Waste Management (J-PRISM Project), Learning and Ecological Activities Foundation for Children (LEAF Project), LEAF II Project, Mataniko Clean Up and Rehabilitation Project, Si Ridge to Reef Project (SIR2R), Waste to Energy Pyrolysis Pilot Project, Pacific Ecosystem-Based Adaptation

to Climate Change Project (PEBACC Project), Rapid Employment Project, Community Access and Urban Services Enhancement (CAUSE Project), Litter Boom Pilot Project, Global Monitoring Plan Project (GMP) Phase I, Global Monitoring Plan Project Phase II, Commonwealth Marine Litter Programme (CLIP), Eco-Bag Pilot Project, Eco-School Program and Pacific Hazardous Waste Management Project (PACWASTE Project) (MECDM, 2017 and NIP, 2018).

SOLID WASTES

The most pressing municipal waste management issues centred on the capital. Honiara City covers an area of 22.73km<sup>2</sup> with a total population of 64,609 inhabitants (J-PRISM Project ,2019). The waste collection system in Honiara covers the areas within the City and to the Town boundary, and final disposal at the Ranadi landfill (Figure 7.1). Estimates show a 50% increase in waste generated per person (Honiara) between 1990 (0.62 kg/person/day) and 2017 (0.86 kg/person/day). This, coupled with an increase in the Honiara population, has led to an estimated threefold increase in total waste generated. Based on estimates from a recent survey conducted under the CLIP through the Asia Pacific Waste Consultants in 2018 shows that the waste disposal rate per person per day in Honiara

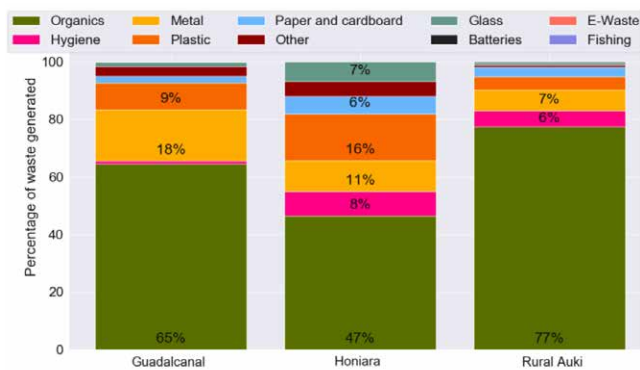


**FIGURE 7.2.** Waste disposal rate for three provincial areas in 2018 © Wander et al, 2018.

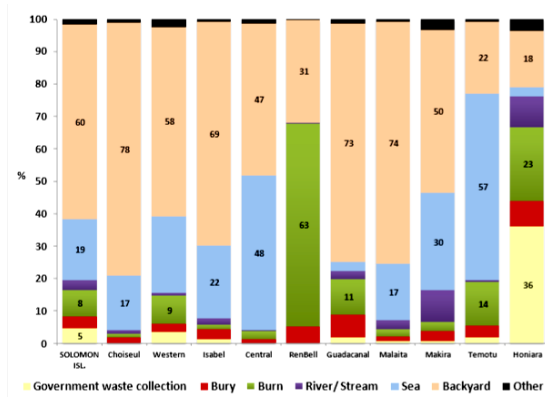
is approximately 310g (0.31kg/person/day; Figure 7.2). This result shows that almost half of the waste generated per person per day in Honiara is not collected or managed (Wander et al. 2018).

The 2009 census data showed that the dominant waste disposal methods across most provinces were backyard and sea dumping (Figure 7.3). Across all of the Solomon Islands, only 5% of households had their waste collected by government services. Burning was also prevalent and in Honiara government collected 36% of waste (Figure 7.4). Recent water quality monitoring conducted in May 2019 have confirmed the illegal disposal or dumping of wastes into the Mataniko river particularly by communities and developments located along the river in Honiara (Airahui, 2019).

The most common waste generated, and waste item found, across most of the provincial centres in Taro, Gizo, Noro, Munda, Buala, Auki, Guadalcanal and Honiara is organic waste (Figures 7.4, 7.5). Organic waste includes food and other organic materials such as vegetables, grass or leaves. The other top waste items in Solomon Islands identified includes aluminum cans, steel cans, plastic bags,



**FIGURE 7.4.** Breakdown of waste types compared between three Provincial Centres in Solomon Islands, 2018 (© Wander et al. 2018).

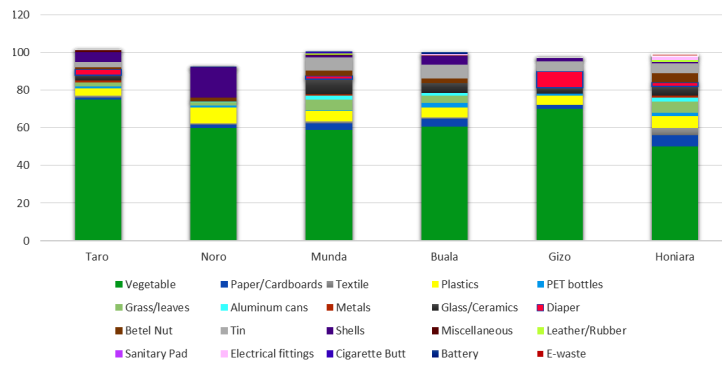


**FIGURE 7.3.** Proportion of private households by place of residence and main mode of waste disposal (%), (Solomon Islands National Statistical Office 2009a).

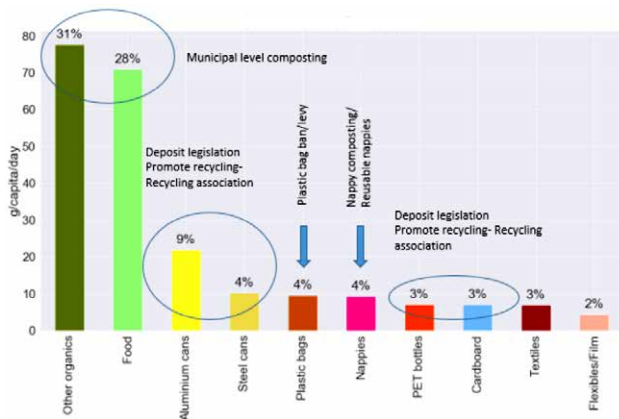
nappies/diapers, PET Bottles, cardboard, textiles and flexibles/films (Figure 7.6).

Honiara and a few provincial centres are serviced by a solid waste collection and disposal systems. Most often the waste collection service is inadequate and irregular. Most of the rural areas are not provided with a solid waste collection and disposal system (Dr. Mataki, 2009). According to the Solomon Islands National Statistics in 2009, Government waste collection in rural areas was 0.5% whilst the percentage of households in the urban areas having access to a government waste collection service is 29.5% (Figure 7.7). The waste collection rate against the generated amount is 59%, and 68.4% to the discharge amount in Honiara City, according to a JICA survey in 2017. This result shows a 15% increase in the waste collection service for Honiara in comparison to the 44% rate in 2009.

Ranadi Landfill is the only controlled landfill or final disposal site in the country with a total area of two hectares (J-PRISM, 2017). During the flash floods in April 2014 the Ranadi dumpsite was a disaster area. Through the support of the J-PRISM Phase I project the dumpsite was rehabilitated into a more controlled landfill site which



**FIGURE 7.5.** Breakdown of waste types compared between six Provincial Urban Centres in Solomon Islands between 2014–2015 © MECDM, 2019.



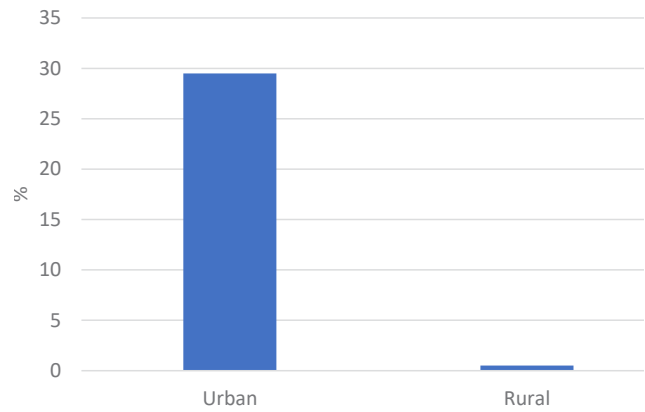
**FIGURE 7.6.** Top ten items of waste in Solomon Islands and proposed solutions (© Wander et al. 2018).

extends the lifespan for a few more years. Through the support of the Japanese Grassroot grant and the New Zealand Headsup project, a site office was constructed and fenced to provide shelter for workers at the landfill site. The landfill has also benefited from support funded under the Environment and Conservation Division development budget, through the Ministry of Environment Climate Change Disaster Management and Meteorology, to rehabilitate the site.

Several communities and local governments have benefited from the Provincial Waste Management Grants, funded under the Environment and Conservation Division development budget through the MECDM. The purpose of the provincial grant was to support communities, schools and other sectors to address waste management issues or problems and support their initiatives in the provinces (Figure 7.8). The past and current beneficiaries from this support include Gizo Town Council (Western Province), Honiara City Council (Honiara), Moli Community (Makira Ulawa Province), Ro'one Community (Malaita Province), Gizo Beautification (Western Province) and Hadja Community (Makira Ulawa Province).



**FIGURE 7.8.** Promotion of proper waste management through environmental education in schools. Pictured is the initiatives implemented at St. Nicholas Primary School in Honiara under the Eco-School Program (©Wendy Beti/ECD, 2015).



**FIGURE 7.7.** Percentage of Solomon Islands households with government collection in 2009 (Solomon Islands National Statistical Office 2009b).

Recycling is operated mostly by the private sector with most of the operations based in Honiara. In the other provinces, there are a few small-scale recycling initiatives particularly in Gizo and Noro. In Gizo, a locally operated recycling centre funded by various partners was established to address the issue of littering of aluminium cans in the tourist hub of Western Province (Figure 7.9). A similar system was established in Noro Town, Western Province by the SolTuna Employees Credit Union. In the other provinces there are some individual initiatives or no-return systems in place. Currently, the recyclable materials collected includes scrap metals, aluminium cans, brass and used lead acid batteries.

The material recovery rate for Honiara is estimated at only 7.2% of the generated waste and onsite recycling of organic wastes is 5.4% of the generated waste (J-PRISM, 2017). This is also a target under the LEAF Phase I project to establish a separate collection system of household wastes through private-public partnerships based on the 3Rs concept (LEAF Project, 2014). The challenges to promoting recycling, or to introducing a container deposit scheme, include the tax placed on export of recyclable





**FIGURE 7.9.** Newly established recycling centre co-funded by several partners in Gizo, Western Province (© Wendy Beti/ECD, 2019).

materials which, if removed, will improve collection rates. In addition to that is the lack of finance for collection of legacy recyclable materials such as cans and bottles, poor existing recycling infrastructure and capacity, poor waste collection service or coverage. This is largely due to the widely dispersed population and high inter-island shipping costs (Leney, 2019).

Despite the high composition of organic wastes generated through the waste stream in the country (Figure 7.4–7.6), composting initiatives are mostly managed at a small scale by NGOs or individuals at the household level. There is no large-scale commercial composting operation except for small-scale composting operated by two local NGOs namely; Kastom Gaden Association and Zai Na Tina Organic Farm to promote organic farming methods (Woodruff, 2014).

### E-WASTE

The Solomon Islands is not a party to the Basel Convention but is a party to the Waigani Convention. As such it could access assistance when it comes to dealing with the trade of hazardous e-waste outside the Pacific region market. Much of the potential e-waste is found in Honiara and other

provincial centres, specifically in office and institutional settings. In the rural areas, there is a close link between the use of mobile phones and used lead acid batteries, with the increasing installation of Solar Photovoltaic (PV) systems commonly used for lighting, to charge phones and other electrical appliances (SPREP PACWASTE, 2014).

A pilot project funded through the PACWASTE Project was implemented between 2015–2017 AND aimed at recovery of Used Lead Acid Batteries (ULABs) (Figure 7.10). The project was implemented in collaboration with a local company, Solomon Power SI Ltd (SPSIL) to recover the ULABs from households in the provinces using the PV systems. The Total quantities of ULABs (small and big sizes) exported to Pacific Batteries in Fiji under the Waigani Convention was more than 30,000 kg in two full containers. These ULABs were collected from around Honiara, Guadalcanal, Malaita, Isabel and Choiseul and Makira Ulawa Provinces. Some of the challenges during the project was lack of awareness on the dangers of the batteries to human health and the environment if not properly disposed, as well as the logistics costs for recovery of these ULABs from the provinces (MECDM, 2018).



**FIGURE 7.10.** Used Lead Acid Batteries packed onto a pallet ready to be packed and sealed at the SolPower SI Ltd warehouse in Honiara (© MECDM, 2018).

## HEALTH-CARE WASTE

Health-care waste includes infectious wastes, sharps and pharmaceutical wastes. Generally, health-care waste (HCW) is managed by individual hospitals or clinics with little intervention by the Ministry of Health and Medical Services although they are responsible for regulating health-care wastes. There is a comprehensive Infection Control Policy guideline for Health Facilities 2004 which is quite outdated (SPREP PACWASTE, 2014) and a draft Health Care Waste Policy developed in 2008 with no progress made so far (MECDM, 2017). Six hospitals were part of an assessment undertaken in 2014 through the SPREP PacWaste Project which covers waste generation, storage, treatment and disposal and an outcome from this survey was the provision of five incinerators to five of the hospitals assessed (SPREP PACWASTE, 2014; Figure 7.11). Only one of the five incinerators located at the National Referral Hospital in Honiara was commissioned and used, however, currently it is not used due to technical issues amongst other factors.

## HAZARDOUS AND CHEMICAL WASTES

Hazardous and chemical wastes are materials that can be either in the state of solid, liquid and gas and exhibits any of the characteristics of ignitability, corrosivity, reactivity and toxicity when referencing it to chemicals. Chemical wastes in this regard refers to any harmful waste produced from dangerous chemicals (MECDM, 2017). Asbestos containing materials are one of the hazardous and chemical wastes in the country, and is mostly found in building materials used for construction. Results from the study conducted in 2014 under the SPREP PacWaste Project indicates that a high proportion of asbestos is found in residences in the form of cladding (SPREP PACWASTE, 2014), for example, in floor tiles. Since 2010, estimates recorded indicated an increase in the importation of chemicals from 12% in 2014 to 21% in March 2019 (CBSI, 2019). These figures highlight the need to stocktake the volume of chemical wastes in the country's waste stream for proper management and safe disposal throughout its



**FIGURE 7.11.** Large Incinerator installed at National Referral Hospital in Honiara under the SPREP PACWASTE Project (© Allen Kisi Ofea/ECD 2017).

life cycle. This is also emphasised in the National Waste Management and Pollution Control Strategy 2017–2026 (MECDM, 2017).

A lot of chemicals are used and stored in schools or laboratories. In 2018 a major cleanup of illegally disposed chemicals was done near the Tuvuruhu School in Honiara by RSIPF and MECDM, which poses a threat to the nearby community and the surrounding environment. These chemicals are still stored in a container at the Ranadi Landfill for proper disposal by the responsible mining company. There are other expired chemicals still stored in school laboratories or other institutions without any plans for its proper treatment and disposal due to the lack of facilities in the country to properly dispose of these hazardous wastes. Another example of the illegal disposal of hazardous wastes into the environment is the Tanaro oil spill cleanup in West Guadalcanal (Figure 7.12). This was a shipment of hazardous waste oil from Simberi Mining in Papua New Guinea, and imported into the country without any proper documentation.

## LIQUID WASTE

Liquid wastes are one of the major wastes highlighted in the ten-year integrated waste management and pollution control strategy for the country. In general, liquid wastes refers to fluids of any sort whether dirty or clean, toxic or not, such as oil, grease, fats or sewage, to name a few (MECDM, 2017).

The most common form of liquid wastes generated that remains difficult to manage and regulate is sewage waste, due to the limited data available. The Solomon Water 30-year strategic plan outlines the plans for management of the sewage system in Honiara (Solomon Water, 2018). Along the Mataniko river there are two major sewage outlets that discharge directly into the river without any form of treatment, contributing to the major pollution of the river system. Most of the communities near the river and at the river mouth still used the Mataniko river for washing and bathing as well as other purposes (Green Clean Environment Team, 2015).



**FIGURE 7.12.** Tanaro Oil Spill in West Guadalcanal (© Allen Kisi Ofea/ECD 2017).

One of the other most significant liquid wastes arising from commercial establishments, productive and extractive industries is the wastewater. The Gold Ridge mine tailings dam located in central Guadalcanal poses a threat to communities living downstream.

## Impact

The increasing volumes of waste will increasingly impact on the health of people, the tourism industry, economy, infrastructure and the environment if not well managed. This is most evident in Honiara as the site of the highest numbers and concentration of people nationally. Auki Town and Gizo Town are two other sites with an increasing concentration of people in comparison to other provincial centres.

Tourism is an industry that promotes cleanliness and preservation of the environment. Results from a tourist survey conducted in recent years highlights several issues raised by tourists, that Honiara is the dirtiest city in the Pacific, along with wastes. The impacts of wastes on the tourism sector includes fewer holiday tourists visiting the country. This in turn will result in Tourism Solomons not being able to package holiday tours in Honiara or in the provincial centres (SIVB, 2015).

Wastes should be removed from residential areas regularly otherwise it will cause a public health nuisance (Kishimoto, 2019). Wastes such as organics, if not removed in time, produces a bad odor due to the local climate and conditions in the country. Uncollected wastes create a breeding grounds for bacteria, vectors and pests such as cockroaches, rats, flies, malaria and dengue mosquitoes (Patterson, 2019). Tins, containers or plastic bags, if not properly disposed into a waste bin, can collect and hold water during rainy periods which will increase the incidence of malaria and dengue fever. Broken bottles and empty tin cans littered on the ground cause injuries. Open burning of wastes or plastics release harmful chemicals such as dioxins that persist in the environment for a long period of time, and are closely linked to severe health risks such as heart and respiratory ailments such as asthma, or even cancer (Kishimoto, 2019). Analysis from a Global Monitoring Plan Phase I project undertaken for human milk and passive air samples from six Pacific countries shows that Solomon Islands records the highest concentration of the DDT group of persistent organic pollutants (POPs) in the Pacific islands region (UNEP, 2009). The results confirm the use of this legacy chemical that came to the Solomon Islands during the war, and on the rice farms of Okea and Ilu and North Guadalcanal in the 1960s and 1970s.

Currently, the existing system for waste collection is still limited to certain accessible areas only within the City boundary in Honiara and in a few provincial centres. Improper waste management causes both direct and indirect pollution to the air, land, water and the ocean. Waste disposed into the bush, rivers and streams get washed into the ocean and suffocate coral reefs. Plastic

debris washed into the ocean through the drainage systems threatens marine life such as turtles.

Infrastructure required for waste management is costly for local governments in terms of the cost for administration, spare parts for vehicles, maintenance service, workers salary and for hiring of machines for rehabilitation work or construction works at the landfill site. Public infrastructure such as roads and bridges are affected by disaster wastes. During the April 2014 flash floods, debris carried downstream by the floods damaged bridges in Honiara and parts of Guadalcanal. Shorelines were also covered with debris that was washed ashore by the strong waves, producing bad odor and polluting the beach front (ECD, 2014)

Littering of waste and improper disposal requires regular cleanup. This takes up more government funds for cleanups that could have been used to support schools and health facilities. It is costly to provide a regular waste collection service. Landfills require sufficient space to properly operate the site for final disposal.

The effects of pollutants show in basic environmental parameters such as water quality and air quality, with downstream effects on human health, and species and ecosystems.

The growing volumes of waste will increasingly impact on the health of people, the tourism industry and the environment, if not well managed. This is most evident in Honiara as the site of the highest numbers and concentration of people nationally. Currently, the existing system for waste collection is still limited to certain accessible areas only within the town boundary. The effects of pollutants show in basic environmental parameters such as water quality and air quality, with downstream effects on human health and species/ecosystems.

## Response and recommendations

- Fund and implement National Waste Management and Pollution Control Strategy 2017–2026.
- Develop, fund and implement Waste Management Plans for all Provincial Centres to improve waste management.
- Development and enforcement of Environmental Ordinances.
- Encourage and support Public Private Partnerships.
- Encourage and promote environmental education.
- Economic Instruments/measures for sustainable Solid Waste Management.
- Environment Act 1998.
- Awareness and Education.
- Support Solomon Islands Recycling & Waste Management Association.
- Support 4Rs initiatives and networks e.g. Plasticwise Gizo, Kastom Gaden Association, Zai Na Tina, etc.
- Support Implementation of projects e.g. Mataniko Project, J-PRISM Project, SIR2R, Bio-gas Pilot Project, LEAF Project, BIT Pilot project, etc.



- Support Landfill site assessments for establishment of new landfill sites in Honiara and in the provinces.
- Invest in infrastructure developments for Waste Management including related infrastructures e.g. Incinerator, roads, etc.
- Incentivise business opportunities in wastes.
- Explore options for banning of single-use plastics.
- Conduct systematic wastes audits for all provinces including Honiara.
- Implement the Greater Honiara Urban Development Strategy and Action Plan 2018.
- Support the implementation of Solomon Water 30 Year Strategic Plan.

## References

- Green Clean Environment Team (2015). Community Baseline Assessment Report for Mataniko River Clean Up and Rehabilitation Programme. Honiara.
- Environment and Conservation Division (2018). Used Lead Acid Battery Collection System Final Progress Report January 2018. Ministry of Environment, Climate Change Disaster Management & Meteorology, Honiara.
- Environment and Conservation Division (2014). Post Disaster Environment Impact Assessment. Ministry of Environment Climate Change Disaster Management & Meteorology, Honiara.
- Solomon Islands Visitors Bureau (2015). Presentation on Tourism and Waste Management by Freda Unusi. Solomon Islands Visitors Bureau, Honiara.
- United Nations Environment Programme (2012). Supporting the Global Monitoring Plan on Persistent Organic Pollutants in the Pacific Islands Regional Report. Global Environment Facility/UNEP.
- Patterson, B. (2019). Presentation on Solid Wastes and Health Impacts. Ministry of Health and Medical Services.
- Solomon Islands National Statistical Office (2009a). 2009 Population and housing census: Basic tables and census description. Ministry of Finance and Treasury, Honiara.
- Solomon Islands National Statistical Office (2009b). 2009 Population and housing census: Report on Migration and Urbanisation. Ministry of Finance and Treasury, Honiara.
- LEAF Project (2014). Learning and Ecological Activities Foundation for Children Project document, Honiara.
- Kishimoto, N. (2019). An investigation of actual waste collection services for the formulation of a municipal solid waste collection plan in Honiara City, Solomon Islands. Kyoto University, Japan.
- Woodruff, A. (2014). Solid Waste Management in the Pacific: Solomon Islands Country Snapshot. Asian Development Bank. Manila.
- Secretariat of the Pacific Regional Environment Programme (2014). E-Waste Country Assessments: Solomon Islands Country Report Extract-Ewaste Generation and Recycling and the potential for interventions. PACWASTE Project. July 2014. PacReef.
- Secretariat of the Pacific Regional Environment Programme (2014). Baseline Study for the Pacific Hazardous Waste Management Project-Healthcare Waste: The collection, collation and review of data on the management of Healthcare waste and best-practice options for its disposal in participating PICs, Solomon Islands. PACWASTE Project. July 2014. ENVIRON Australia Pty Ltd.
- Secretariat of the Pacific Regional Environment Programme (2015). Survey of the Regional Distribution and Status of Asbestos-Contaminated Construction Material and Best Practice Options for its Management in Pacific Island Countries. PACWASTE Project. May 2015. Contract Environmental Ltd.
- Solomon Water (2018). Vision for the future: Solomon Water Strategic Plan. PWWA Conference, August 2018. [http://www.pwwa.ws/pdfs/Vision\\_for\\_Future\\_Solomon\\_Water\\_30\\_years\\_Strategic\\_Plan.pdf](http://www.pwwa.ws/pdfs/Vision_for_Future_Solomon_Water_30_years_Strategic_Plan.pdf)
- J-PRISM Project (2017). Draft Solid Waste Management Plan for Honiara City. J-PRISM II Project, Honiara, Solomon Islands.
- Ministry of Environment Climate Change Disaster Management & Meteorology (2015). Community Baseline Assessment Report. Prepared by Green Clean, Honiara, Solomon Islands.
- Wander, A., Sagapolutele, F., Foxe, A., and Prince, A. (2019). Solomon Islands Waste Data Report - Analysis of waste generation and waste disposal data collected in November 2018. CEFAS/APWC.
- Airahui, S. (2019). Mataniko River Catchment Water Quality Monthly Monitoring Report (January - June, 2019). GEF/Pacific International Waters - SI Ridge to Reef Project, Honiara, Solomon Islands.
- Environment & Conservation Division, (2015). Taro Waste Audit Report. Ministry of Environment Climate Change Disaster Management & Meteorology, Honiara, Solomon Islands.
- Environment & Conservation Division (2015). Buala Waste Audit Report. Ministry of Environment Climate Change Disaster Management & Meteorology, Honiara, Solomon Islands.
- Environment & Conservation Division (2014). Noro Waste Audit Report. Ministry of Environment Climate Change Disaster Management & Meteorology, Honiara, Solomon Islands.
- Hilly, J. (2014). Munda Waste Audit Report. Ministry of Health & Medical Services, Honiara, Solomon Islands.
- Rizwold, E. (2015). Honiara Waste Characterization Report 2015. Honiara City Council, Honiara, Solomon Islands.
- Ministry of Environment Climate Change Disaster Management & Meteorology (2017). Solomon Islands National Waste Management and Pollution Control Strategy 2017–2026. Honiara, Solomon Islands.
- Leney, A. (2019). A Prefeasibility study to Introduce a Container Deposit Scheme into the Solomon Islands for J-PRISM II Project. April 2019, PacReef.
- UNEP (2016). Marine plastic debris and microplastics – Global lessons and research to inspire action and guide policy change. United Nations Environment Programme, Nairobi, Kenya.
- Dr. Matak, M. (2011). A Critical Assessment of the Paradigms for Solid Waste Management in Pacific Island Countries. Murdoch University, Australia.
- Pacific Region Infrastructure Facility (2018). Pacific Region Solid Waste Management & Recycling - Pacific Country Profiles & Territory, World Bank & ADB.
- Ministry of Lands, Housing and Survey (2018). Greater Honiara Urban Development Strategy and Action Plan. ADB TA 49460–001 REG: Strengthening Urban Infrastructure Investment Planning in the Pacific. Volume 1, July 2018.
- Central Bank of Solomon Islands (2019). Quarterly Report. <http://www.cbsi.com.sb/publications/quarterly-review/>
- Solomon Islands National Statistical Office (2009a). 2009 Population and housing census: Basic tables and census description. Ministry of Finance and Treasury, Honiara.
- Solomon Islands National Statistical Office (2009b). 2009 Population and housing census: Report on Migration and Urbanisation. Ministry of Finance and Treasury, Honiara.

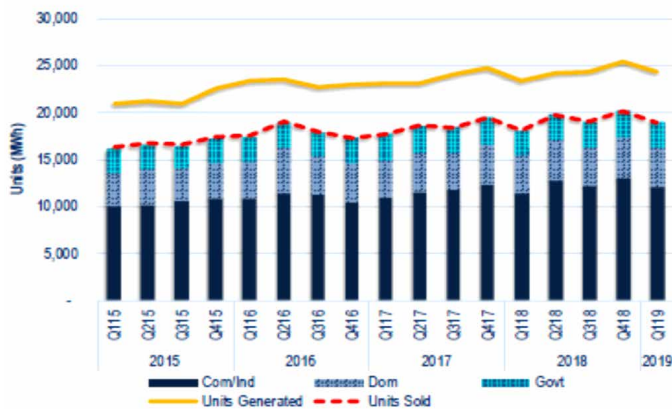
Per capita power consumption This indicator tracks the percentage consumption of electricity and accessibility to the different energy sources.



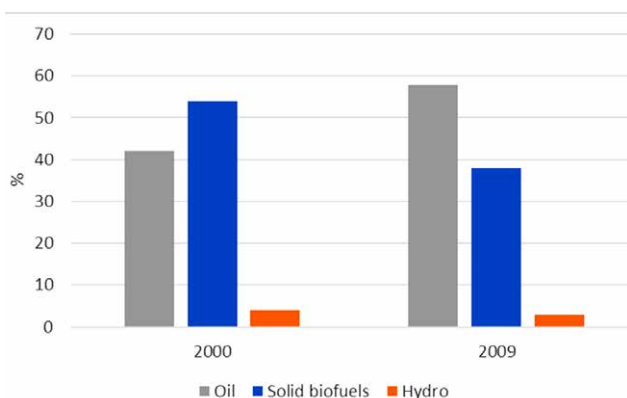
**Status**  
Fair

**Trend**  
Unknown

**Data confidence**  
Medium



**FIGURE 7.13.** Units of electricity generated and sold between 2015–2019 (©CBSI & SIEA, 2019).



**FIGURE 7.14.** % contribution of main energy source in the Solomon Islands in 2000 and 2009. Solar and liquid biofuels each contributed 0.1% to the total energy supply in 2009 (IRENA 2009). [extracted from Renewable energy indicator under Atmosphere & climate].

SDG

**1** NO POVERTY

**7** AFFORDABLE AND CLEAN ENERGY

1.4; 1.4.1

7.1; 7.1.1 7.2;

7.2.1

### Status and trend discussion

Energy is a key driver for robust economic growth, social development and for improvement of community livelihoods of the people of Solomon Islands. Like other Pacific island countries in terms of its energy situation, Solomon Islands has its share of challenges and opportunities. Due to the nature of the country’s geographical distribution, the coverage of electricity across the country is quite low, with high costs of energy and a high dependency on fossil fuel imports impacting on socio-economic development. Nevertheless, the country is also blessed with rich renewable energy resources that have the potential for investment in wind, sun, hydro and geothermal energy (MMERE,2014). According to Wade and Bulehite (2016) the two major sources of energy in the country are petroleum products and biomass. Although there is no exact data on percentage use of biomass as a source of energy, indications are that it is larger in percentage relative to the gradual increase of petroleum use.

National energy issues fall under the regulatory authority of the Energy Division within the Ministry of Mines, Energy and Rural Electrification. The Energy Division has developed national energy policies and strategies. The Solomon Islands National Energy Policy 2014 outlines the key priorities of the Government and a roadmap to address the energy sector over ten years (MMERE, 2014).

One of the key partners in the energy sector is Solomon Power (formerly the Solomon Islands Electricity Authority or SIEA). Under the outdated Electricity Act of 1969, SIEA (now known as Solomon Power) had the monopoly

right to provide its services at any geographical location of its choice (Wade and Bulehite 2016; Figure 7.13). Solomon Power is solely responsible for the generation, transmission, distribution and sale of electricity to both domestic and commercial customers having power stations in Honiara, Auki, Maluu, Munda, Gizo, Noro, Buala, Tulagi, Lata and Kirakira. There is currently no private sector participation in power generation. However, the Government has indicated a preference for private sector development of generation assets (MECDM 2nd National Communication 2017).

Figure 64 indicates that only 15% of the population had access to electricity and the per capita electricity use was 142 kWh, or 354 kWh below the per capita use for Melanesia combined. Estimates also show that overall, 95% of the population uses ‘wood or coconut shells’ as the main source of cooking fuel, whilst in Honiara the rate is 53%, and those using gas make up 37%. Kerosene lamps are still used as the main source of lighting for households according to statistics in 2009 (MOFT, 2009).

The Solomon Islands’ Intended Nationally Determined Contribution report noted that emissions from Solomon Islands (as at 2015) are approximately 20 Mt CO<sub>2</sub>e/year representing approximately just 0.01 % of global emissions. Solomon Islands emissions are therefore low (on a global scale) but are expected to rise under current scenarios. Solomon Islands needs to play its role in the global efforts to adapt to the effects of climate change. At the same time, it must extend access to ‘affordable and clean energy’ (SDG 7) to those that need it (MECDM,2nd National Communication, 2017).

In 2017 there was a change in tariff rates with a reduction by 12.5% which resulted in lower charges to consumers in comparison to the tariff rate in 2016 (Solomon Power 2017). The reason for the reduced tariff rates was two newly commissioned solar farms of 1MW capacity, supported by a battery hybrid system added to the grid. In addition, there was a 150 kW mini-hydro. These initiatives have reduced diesel consumption which has a positive impact on the tariff (Utilities Regulatory Authority, 2019). In its 2017 Annual Report, Solomon Power stated

that it intends to improve the reliability of energy supply and improve infrastructure, including hydro and hybrid generation with development projects. These are funded internally and from other sources such as the World Bank Solomon Islands Sustainable Energy Project (SISEP) and ADB Provincial Renewable Energy Project (PREP) earmarked for the Fiu River Hydropower Project. Other current projects in progress or recently completed include:

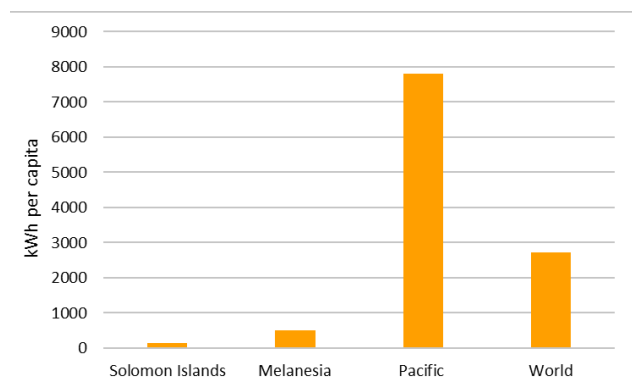
- Lungga Power Station Expansion
- Solomon Power HQ Refurbishment Project
- UAE/NZ Funded 1 MW Solar Farm Project
- Outstations Upgrade Project
- Buala Hydro Re-commissioning
- Feeder 12 relocation, Upgrade to Ranadi Substation and new Kola’a Ridge Substation
- Network extensions
- Hybrid Generation Systems in Seghe and Taro
- Solar Power Development Project
- Solomon Islands Electricity Access and Renewable Energy Expansion (EAREEP Project) Phase II

(<http://solomonpower.com.sb/projects/projects/>)

Estimates in 2009 indicate 54.5% of Solomon Islands total primary energy supply was from renewable sources, mostly solid biofuels (Figure 7.14). While 54.5% is a substantial contribution from renewable energy, most of this was solid biofuels used in household cooking, a practice associated with poor air quality and respiratory illness (refer to air quality indicator). At the same time only 15% of the population had access to electricity, and the per capita electricity use was 142 kWh, 354 kWh below the per capita use for Melanesia combined. Figure 19 indicates that as Solomon Islands continues to develop, its energy requirements will increase. This was reflected in the increase in power generated by oil (mostly diesel generators) between 2000–2009 (IRENA,2009).

A current World Bank project which started in 2018 is one of the projects implemented through Solomon Power. The project’s objective is to provide increased accessibility to grid supplied electricity as well as supporting Government initiatives to boost sustainable renewable energy production, whilst reducing the country’s reliance on imported fossil fuels for power generation ([www.worldbank.org](http://www.worldbank.org)). Through the project, Solomon Power aims to deliver renewable energy hybrid mini-grids, electricity connections in low-income areas, and new grid-connected solar power, to provide access to electricity to various sectors such as households, small businesses, schools and health centres in Honiara and surrounding provincial centres (Solomon Power, 2019).

Agreements have also been recently signed to increase renewable energy generation through the Tina River Hydropower Development Project which aims to increase the amount of renewable energy in the Honiara grid to nearly 100% ([www.worldbank.org](http://www.worldbank.org)). The project will install a 15 mega-watt hydropower scheme on Guadalcanal



**FIGURE 7.15.** Electricity use per capita in the Solomon Islands in 2009 compared with regional and global averages (IRENA, 2009).



operated by an independent entity who will then sell electricity to Solomon Power. The 23km transmission line will connect the Tina River Hydropower substation to the Solomon Power electrical grid at Kukum substation, which will in turn connect to the Lungga diesel Power station (Tina Hydropower Limited ESIA, 2019). Currently the project has complied with the requirements specified under the Environment Act 1998 and is working towards attaining a Development Consent.

A JICA-funded solar project is being piloted at the Solomon Power carpark at the Ranadi office in Honiara. A grid connected to a 50kW Photovoltaic (PV) system with no storage was installed and since 2014 approximately 60,000kWh of energy was generated. This is equivalent to more than 80 drums of diesel fuel with an estimated cost of SBD \$145,000. The solar farm has supplied much of the electricity needs of the SIEA office at the Ranadi complex and is a precursor to more solar farms which will reduce the dependence on expensive diesel imports (<https://prdrse4all.spc.int/data/jica-solar-farm-pilot-project-solomon-islands>).

Several communities have been targeted through Melanesia's Million Miracle Programme (M3P) implemented between 2014–2017 in Choiseul, Guadalcanal and Central Provinces. Through this project the estimated power generation capacity from this off-grid solar PV system is 60Wp 12v in all the six communities. The six pilot communities benefiting from this off-grid renewable energy includes: Tavula ward, Taba ward, Tepazaka ward, Vuracachu ward, Hulavu conference centre and Taroniara Clinic (<http://prdrse4all.spc.int/content/solomon-islands-m3p-activities>).

Another project was implemented between 2015–2018 in two rural institutions piloted in West Guadalcanal, Guadalcanal Province and West Kwaio, Malaita Province. The project was aimed at reducing costs for diesel fuel by replacing the diesel-powered generation with a low voltage solar grid smart system for large boarding schools such as Su'u National Secondary School and Selwyn College National Secondary School. A 70kW solar-diesel hybrid system was installed at each school to increase the availability of electricity and freshwater (<http://prdrse4all.spc.int/content/replacement-diesel-powered-generation-low-voltage-solar-grid-smart-system-large-boarding>).

Another energy project was introduced in several communities in Choiseul in 2014. Through the CHICCAP platform the project was implemented by the Tarekukure Provincial Development Farm with a focus on analysing the cost-benefits of using pig manure in a Biogas digester to increase energy security and resilience to external price shocks. One of the challenges identified in the case study of the biogas digester was that, in the absence of pig manure, making use of plant biomass or adding organics to the manure will increase the biogas productivity (Wilks, 2014).

There is a positive relationship between GDP and per capita energy consumption and, as the Solomon Islands continues to develop, there will likely be an increase in energy consumption.

## Impact

Ensuring access to affordable, reliable and modern energy is a key element of the Sustainable Development Goals (Goal 7). At the same time, there is an interest in energy intensity in relation to the use of fossil fuels and their contribution to climate change. Burning fossil fuels contributes to global greenhouse gas emissions and leaves countries and their residents vulnerable to fluctuating oil and gas prices and availability. In Solomon Islands, less than 20 per cent of the population has access to power supply, and when electricity is available, it is costly and unreliable. A stable supply of grid-based electricity has the potential to promote economic growth, including tourism industry development, and improve human capital, through better conditions for children to study, and reducing the burden of household work (Pacific Centre for Renewable Energy, 2018).

Although most parts of the country's outdoor air quality is good, there are risks to respiratory illness affecting people's health and wellbeing due to exposure to:

- Increased concentration of pollutants from vehicle emissions (land and sea transport).
- dust from transport and other mechanised activities, and open burning of waste.
- Indoor burning of biomass for cooking.

The renewable energy projects will provide access to electricity in rural households and institutions, and access to low cost grid-connected electricity in the urban areas. Energy sources from wind, sun, hydro, geothermal and biogas from animal manure produce clean energy and reduce carbon emissions compared to fossil fuel energy sources. It also reduces the countries vulnerability on imported fossil fuels and price shocks on the global market. Having access to clean energy sources will reduce people's exposure to pollutants from vehicle emissions, dust and indoor cooking especially women who are more engaged in household cooking daily.

Ensuring access to affordable, reliable and modern energy is a key element of the Sustainable Development goals (Goal 7). At the same time, there is an interest in energy intensity in relation to the use of fossil fuels and their contribution to climate change.

## Response and recommendations

Implement the Solomon Islands Energy Policy 2014 policy outcomes including:

- Access to grid-connected electricity in the urban areas increased to 80% by 2020.
- Access to electricity in rural households and institutions increased to 35% by 2020.
- Use of renewable energy sources for power generation in urban and rural areas increased to 50% by 2020.
- Access to safe, affordable and reliable petroleum products and alternative liquid fuels and gaseous fuels

increased.

- Energy efficiency and conservation.
- Establish a Management Information System (MIS) within environment and line ministries to capture relevant policies for sharing.
- Establish partnerships and policies between ministries to increase sharing of data.

The National Energy Policy Framework includes policies and strategies that contribute to climate change mitigation including:

1. Fuel conservation and efficiency in the transport sector, ii) Promote and implement renewable energy programmes and initiatives including research and development, iii) Use of energy resources in an environmentally sustainable manner and iv) promotion and implementation of energy conservation and efficiency measures.
2. The National Agriculture and Livestock Sector Policy (2009–2014) includes a policy objective to 'mitigate the effect of climate change' and includes policy statements and focussed activities such as i) Developing mitigation plans, ii) Conservation farming such as agro-forestry, and iii) Discourage slash and burn methods (shifting agriculture).
3. The National Solid Waste Management Strategy and Action Plan (2009–2014) includes actions to establish proper sanitary landfills to minimise burning on site and provide for methane capture.

Against the background of the current pressures and the reported lack of regulatory controls, the following actions are also recommended:

- Develop national air quality standards and monitoring systems and ensure proper equipment is in place with a proper training programme.
- Implement emissions regulations for industries.
- Invest in renewable and energy efficient technology and renewable energy.
- Air, land and sea transport vehicle emissions regulation developed and enforced.
- Expand and improve public sea and land transport.
- Legal framework to limit waste burning (proper solid waste management practices – burning, collection and disposal).
- Promotion of on-grid and off-grid electrification.
- Develop and promote alternatives to open biomass burning for cooking (example, kiko oven and kiko stove).
- Strengthen awareness on chemicals Material Safety Data to address risk of gas inhalation caused by improper management of toxic gases and chemicals.

- Management of solar panel waste disposal.
- Develop national appliance labelling and standards for renewable energy and energy efficiency.
- Set clear targets on renewable energy interventions on the new energy policy and provide support to the implementation of the National Energy Policy Framework.
- Encourage Private Sector partnership promoting renewable technology.
- Put in place standards and monitoring system on renewable energy appliances.
- Waste Management systems to be put in place for renewable energy appliances.
- Encourage use of renewable energy technology.
- Put in place a guideline on securing customary land for big energy projects. This guideline to cover awareness, negotiation, etc.
- Invest in renewable energy of all sizes to solve electricity accessibility to communities.
- Invest in capacity building on renewable energy maintenance and sustainability.

Solomon Power reports that a change in tariff rates has resulted in lower charges to consumers, stating that 'the weighted average tariff in 2017 has reduced by 12.5% in comparison to the tariff in 2016 (Solomon Power 2017). Solomon Power's 2017 annual report states the company's intention to improve reliability of energy supply and improve infrastructure, including hydro and hybrid generation.

The Solomon Islands Energy Policy 2014 set out policy outcomes including:

- Access to grid-connected electricity in the urban areas increased to 80% by 2020.
- Access to electricity in rural households and institutions increased to 35% by 2020.
- Use of renewable energy sources for power generation in urban and rural areas increased to 50% by 2020.
- Access to safe, affordable and reliable petroleum products and alternative liquid fuels and gaseous fuels increased.
- Energy efficiency and conservation.
- Establish Management Information System (MIS) within environment and line ministries to capture relevant policies for sharing.
- Establish partnerships and policies between ministries to increase sharing of data.

For responses and recommendations on renewable energy sources, please refer to the "Renewable energy sources" indicator under the 'Atmosphere and climate' theme.

## References

IRENA, 2009. Renewable energy country profile: Solomon Islands. IRENA, International Renewable Energy Agency.

IRENA, 2013. Renewable Energy Opportunities and Challenges in the Pacific Islands Region: Solomon Islands. IRENA, International Renewable Energy Agency (<https://www.irena.org/>).

Central Bank of Solomon Islands (2019). Quarterly Review March 2019. Honiara.

Tina Hydropower Limited (2019). Environment Impact Statement (Updated ESIA from ESIA 2017) for Tina Hydropower Development Project, Solomon Islands. May 2019, Honiara.

Wade, H., and Bulehite, K. (2016). UNDP Asia-Pacific Regional Energy Program for Poverty Reduction (REP PoR).

Solomon Islands Country Assessment. UNDP. <https://www.pcreee.org/publication/undp-asia-pacific-regional-energy-program-poverty-reduction-rep-por-solomon-islands>

<https://www.theprif.org/documents/solomon-islands/energy-power-generation/renewable-energy-country-profile-solomon-islands>

Pacific Centre for Renewable Energy and Energy Efficiency (2018). New Energy Project for Solomon Islands. <https://www.pcreee.org/article/new-energy-project-solomon-islands>

National Statistics Office 2009. Population & Housing Census National Report (Volume 2). Ministry of Finance and Treasury, Honiara.

Solomon Power (2019). Solomon Power Projects and Capital Expansion Programme (2015–2019). Honiara. <http://solomonpower.com.sb/projects/projects/>

Utilities Regulatory Authority (2019). Comparative Report: Pacific Region Electricity Bills, February 2019. <http://ura.gov.vu/attachments/article/8/Feb%202019%20-%20Electricity%20Price%20Comparison%20Report%20-%20Pacific%20Area%20February%202019.pdf>

Solomon Islands Electricity Authority (2016). Lata Coconut Oil fuel trials. SPREP. [https://www.sprep.org/att/IRC/eCOPIES/Countries/solomon\\_islands/35.pdf](https://www.sprep.org/att/IRC/eCOPIES/Countries/solomon_islands/35.pdf)

Ministry of Mines, Energy & Rural Electrification (2014). Solomon Islands National Energy Policy and Strategic Plan: Solomon Islands National Energy Policy 2014. Volume 1. Honiara.

Ministry of Environment Climate Change Disaster Management & Meteorology (2017). Solomon Island 2nd National Communication 2017. Honiara.

<https://prdrse4all.spc.int/data/jica-solar-farm-pilot-project-solomon-islands>

Pacific Regional Data Repository for Sustainable Energy (2019). Solomon Islands Melanesia's Million Miracle Programme (M3P) Activities. <http://prdrse4all.spc.int/content/solomon-islands-m3p-activities>

SPC Energy Programme & Fred Conning (2016). Hulavu Energy Centre Project Report. <https://www.gn-sec.net/zh-hans/node/9317>

Wilks, A. (2014). Preliminary Cost Benefit Analysis of a Biogas Digester-Case Study in Solomon Islands. SPC Technical Report 200, Suva, Fiji.

IRENA, 2009. Renewable energy country profile: Solomon Islands. IRENA, International Renewable Energy Agency.

IRENA, 2013. Renewable Energy Opportunities and Challenges in the Pacific Islands Region: Solomon Islands. IRENA, International Renewable Energy Agency (<https://www.irena.org/>).

2009 Census Report on Tables.

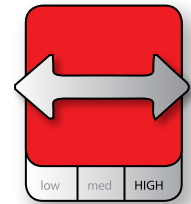
Available: <https://www.theprif.org/documents/solomon-islands/energy-power-generation/renewable-energy-country-profile-solomon-islands>.

Pacific Centre for Renewable Energy and Energy Efficiency.

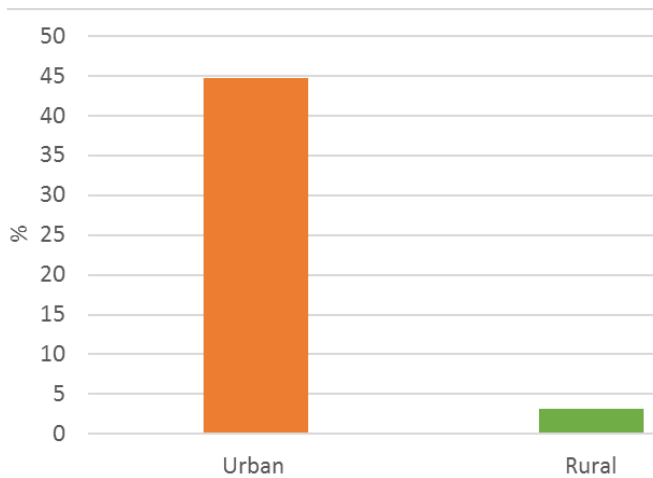


**SANITATION**

Tracks the percentage of households with access to sanitary toilets.



**Status**  
Fair  
**Trend**  
Stable  
**Data confidence**  
High

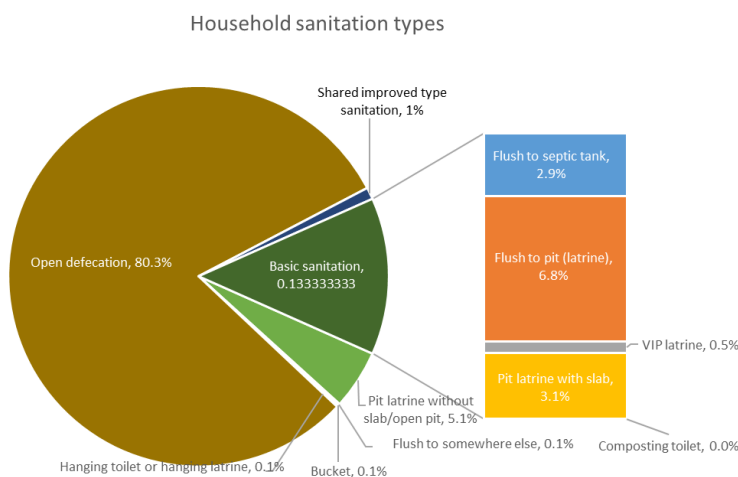


**FIGURE 7.15.** Percentage of urban and rural households with access to private flushing toilets (Solomon Islands National Statistical Office 2009).



**Status and trend discussion**

Solomon Islands census data from 2009 showed that approximately 45% of urban households and only 3% of rural households had access to private flushing toilets (Figure 7.15). Surveys undertaken through the Rural Wash programme (RWASH) in 2016 revealed that 80% of rural households (>300,000 people) used open defecation compared with 13% of rural households (~50,000 people) with access to improved sanitation that hygienically separates human excreta from human contact (Figure 7.16). These data indicate some improvement in access to improved sanitation between 2009–2016 (Figure 7.16), though the 2016 data was based on a sample of the rural population rather than the near-complete coverage of the 2009 census. The 2016 data provides an important baseline on which to evaluate actions aimed at improving access to better sanitation in the Solomon Islands. RWASH Policy 2014 is a challenge because there are some policies outlined in the document that restrict access to proper sanitation in comparison to the past where access to water supply is free (RWASH Policy need to be reviewed to allow for access to sanitation).



**FIGURE 7.16.** Sanitation type breakdown for rural households in the Solomon Islands (Ministry of Health and Medical Services 2016).

**Impact**

Poor sanitation impacts on both human hygiene and health, and environmental health. Other impacts include the effects on the tourism industry.

## Response and recommendations

- Review the RWASH Policy 2014.
- Review the RWASH Strategic Plan 2015.
- Urban WASH.
- Solomon Water 30 Year Strategic Plan 2017–2047.
- Community profiles on sanitation data from provinces (check data from UNDP).
- Urban profiles (City /Town profile).
- RCDF to support communities & schools in constructing sanitary toilets.

- Construction of community toilets, public toilets.
- New strategy for accessibility to sanitary toilets.
- Awareness and education on open defecation.
- Add monetary value for use in bio-gas.

## References

Solomon Islands National Statistical Office, (2009). 2009 Population and housing census: Report on Migration and Urbanisation. Ministry of Finance and Treasury, Honiara.

Ministry of Health and Medical Services, (2016). Rural wash baseline. Environmental Health Division, Honiara.

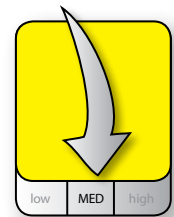


Julie Callebaut/SPREP



HEALTH

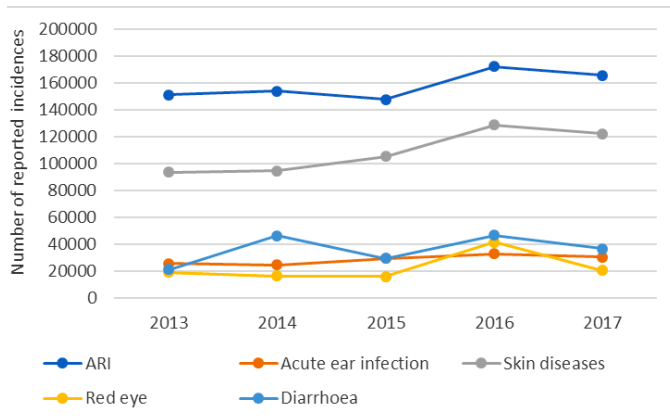
Track reported incidences of selected human health conditions (diseases with an environmental vector: mosquito borne or water borne) that may be related to deteriorating environmental conditions. The target is decreasing or stable reported incidences.



Status  
Fair

Trend  
Deteriorating

Data confidence  
Medium



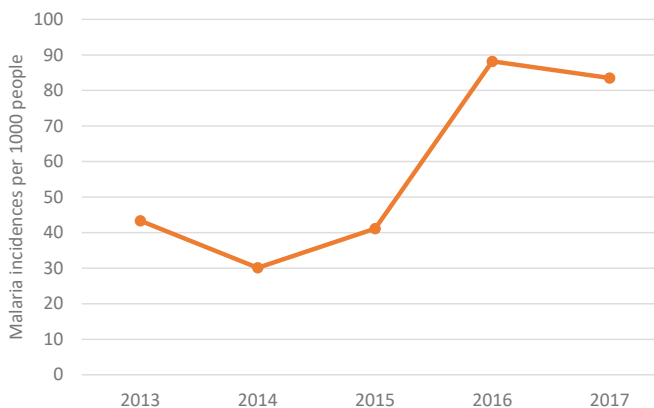
**FIGURE 7.17.** Reported incidences of selected diseases in the Solomon Islands 2013–2017 (Ministry of Health and Medical Services 2018).

Status and trend discussion

The incidence of acute respiratory infection and skin diseases has substantially increased over the period 2013–2017 (Figure 7.17). The increasing incidence of acute respiratory infection may indicate deteriorating air quality, and the increase in skin diseases could be associated with a growing population and lack of access to adequate sanitation facilities, poor water quality and waste management. There has been a slight increase in the incidence of acute ear infection over the same period while red eye and diarrhoea have fluctuated (Figure 7.17).

Malaria is still prevalent in the Solomon Islands despite efforts to eradicate the disease. The primary vector is *Anopheles* mosquitoes which thrive in aquatic environments usually associated with stagnant water. In local communities, potential sources are blocked drainage, edges of streams and rivers, temporary rain pools, and tree holes.

The incidence rate of malaria increased dramatically in 2016 and 2017 compared with the previous three years (Figure 7.18). These data clearly demonstrate that large-scale outbreaks of malaria continue to occur in the Solomon Islands.



**FIGURE 7.18.** Malaria incidence rate in the Solomon Islands 2013–2017 (Ministry of Health and Medical Services 2018).



## Impact

Access to clean water, sanitation and hygiene is a major challenge in the Solomon Islands. At present only 54% of the population have access to improved drinking water sources, 14% have access to improved sanitation facilities, only 13% manage their water sources, while 16% have access to appropriate hand washing facilities. This results in ongoing occurrences of water-borne and water-related diseases in the country.

## Response and recommendations

- Strengthen awareness of health risks and prevention measures.
- Improve waste management practices.
- Make clean energy available and affordable.
- Build more built spaces for physical activities.
- In urban areas, increase the amount of green space.
- Build basic infrastructure for health (showers/toilets).
- National Health Emergency Operations Centre.

## References

Ministry of Health & Medical Services (2018).



Julie Callebaut/SPREP





States funded by the European Union  
Caribbean and Pacific Group of  
An initiative of the African,



**SPREP**  
Secretariat of the Pacific Regional  
Environment Programme

ACP MEAs 2