



‘Resilience means that the resources—both the marine and land resources—have to be used in a way where we can look after ourselves and have a quality life.’
Roviana Conservation Foundation

Pictured: Robin Lingi, Reregana gardens
Photo: Econnect Communication

Building resilience

This document is intended for decision-makers in Solomon Islands with an interest in climate change, community-based adaptation, protecting local land and marine resources, and development.

The Australian Government's **Pacific Adaptation Strategy Assistance Program (PASAP)** brought together traditional and scientific knowledge and practices to assess the vulnerability of remote communities, and their natural resources, to climate change in Solomon Islands.

A community-based approach to adapting to climate change

Roviana region, Solomon Islands

Climate science

Based on research from the Pacific Climate Change Science Program (PCCSP), the future climate of Solomon Islands means:

- » higher air and sea-surface temperatures
- » higher annual and seasonal mean rainfall
- » more frequent and more intense rainfall
- » more frequent and more intense heat
- » fewer droughts and tropical cyclones
- » continued ocean acidification
- » continued sea-level rise.

For Roviana, scientists predict four specific impacts of climate change:

≥60 CM

sea-level rise by 2090

~1°C

sea-temperature rise by 2050

BY 2030

air-temperature rise of 0.5–1.5°C

MORE

erratic and extreme rainfall.

Photo: The University of Queensland

Solomon Islands' climate

Solomon Islands has a tropical climate with high humidity and very little seasonal variation in air temperatures. The average annual air temperature is between 26.5 °C and 27 °C.

Islands in the west experience a marked wet season from November to April. The average annual rainfall in Roviana is about 4000 mm. The annual average rainfall in Honiara (in the east) is about 2200 mm. Rainfall across the country varies greatly from year to year, mainly due to the influence from the El Niño-Southern Oscillation.

Observed changes

The region is prone to natural hazards, such as high rainfall, tectonic uplift and subsidence, and tsunamis.

In the past 20 years, communities in the Western Province of Solomon Islands have observed more intense rain, more erratic winds, hotter temperatures and increasingly unpredictable wet and dry seasons.

The people who live on the coast are experiencing rising sea levels of about 8 mm per year. Some homes have been flooded during high tides and storm surges.

They have observed increases in plant pests and diseases, and a decline in soil fertility.

A community at risk

The Roviana region has been home to human populations for 15 000 years, and its people have a strong history of adapting to social and ecological change.

The impacts of climate change, however, are compounding a range of social stressors that have been building in the Roviana region over recent decades, such as:

- » increasing populations
- » more commercial logging
- » decreasing food yields and biodiversity
- » a shift from subsistence to cash economy
- » lack of employment opportunities for young people
- » weakening community leadership
- » land disputes and shortages
- » health problems, and drug and alcohol abuse.

Research from PASAP has highlighted how remote communities in small-island developing states of the Pacific Ocean can strengthen their own resilience to adapt to the impacts of a changing climate.

‘It’s very important for communities to be well informed of the impacts of climate change so they can deal with the issue within their own means.’

Douglas Yee, Director of Climate Change, Solomon Islands Ministry of Environment, Climate Change, Disaster Management and Meteorology



Photo: Econnect Communication

Community approach

Why use a community-based approach?

There are two main reasons why researchers recommend a community-based approach to adapt to the impacts of climate change—the remoteness of communities and the wealth of local knowledge.

About 85 per cent of Solomon Islands' 520 000 people live in rural areas, and they are widely dispersed over many islands. Transport is very limited. Multiple languages and low literacy restrict communication and outreach activities.

The smaller subsistence communities of Roviana are spread along extensive coastlines—canoes are the main mode of transport. Families are the owners and managers of the land and sea resources.

Tapping into decades of experience

There is little that communities can do to prevent the onset of climate change. However, remote communities have decades of experience managing issues that directly affect their lives.

Existing networks such as churches; and women, youth and farmer groups have established spaces and events where people share information.

Researchers consulted these groups to find out concerns that people have, as well as to seek their input into the design of resilience-building activities.

Lack of food security in agroforestry and marine resource systems, increased commercial logging and fishing, coastal erosion and sea-level rise are major concerns.

Community initiatives that harness traditional knowledge and skills together with scientific information will help to strengthen community resilience to the impacts of climate change.

Planning for a community-based approach

The Roviana Conservation Foundation and other community groups—such as the Kastom Gaden Association, Council of Elders and local women's groups—worked with the Australian and Solomon Islands governments and marine, land and social scientists to collect data about available resources. They:

- » mapped marine and coastal habitats, including the locations and health of coral reefs, seagrass and mangroves
- » surveyed coral bleaching and coral disease
- » measured water quality and water flow into the lagoons
- » documented the health of coastal gardens and forests.

This baseline information enables Roviana communities to identify, assess and monitor changes.



Photo: Econnect Communication

'The sandy foreshore that separated our homes from the water 40 to 60 years ago no longer exists.'

John Pitu, Village Chief, Nusa Roviana



Photo: Econnect Communication

'There are communities that will be affected by sea-level rise—more than 50 per cent of their village will be covered in 50 year's time. Visual tools such as coastal maps are important for explaining the concept of climate change.'

Nixon Buka Tooler, Project Officer, Roviana Conservation Foundation

Baseline data

Assessing the impacts

Researchers used the community feedback to identify issues affecting the adaptive capacity of people.

Land-based resources

The changing climate, among other changes, is affecting the productivity of local agroforestry.

- » Unpredictable seasons are causing staple food crops to rot during very wet periods or die during very dry periods. Pests and plant diseases are more prevalent.
- » Rising sea levels and higher tides are increasing the amount of salt that is entering coastal gardens – either directly from the high tides or carried by the wind.
- » Repeated use of garden areas and agricultural practices such as slash-and-burn are increasing soil erosion and reducing soil fertility.
- » A shift from family-size to commercial farm production means young people value traditional farming knowledge less.

- » Space is declining because of growing populations and growth in commercial agriculture such as forestry and oil palm plantations.

Marine resources

Rising sea levels and higher sea temperatures are affecting marine resources. Fish are an important source of protein.

Sea-level rise will affect some mangrove areas more than others. However, the major threat to mangroves in Roviana is cutting to make room for villages and plantations. Mangroves help stabilise coastlines and reduce erosion, and are a haven where fish and shellfish live and breed.

Commercial logging in the lagoons' catchment area is increasing soil erosion and subsequent sedimentation of the water – which affects fish stocks.

Coral bleaching and disease is also already impacting Roviana and will worsen with climate change.



Photo: Econnect Communication

‘The Roviana Conservation Foundation feels that we should get the villagers, both the young people and the older people, to participate in the different activities that climate change projects involve.’

Miri Taqu, Project Coordinator, Roviana Conservation Foundation



Photo: The University of Queensland

‘We have developed some quite simple tools, using ground-based laser levels, that local communities can use themselves to provide accurate pictures of which areas of their village are more vulnerable to sea-level rise.’

Dr Simon Albert, research fellow,
The University of Queensland, Australia

Priorities for Roviana

Next steps

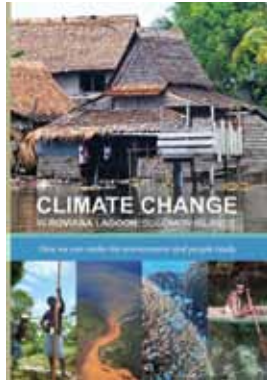
The Roviana Conservation Foundation and the Kastom Gaden Association are integrating resilience-building activities into outreach programs.

The Kastom Gaden Association is encouraging Solomon Islands communities to combine traditional bush-food knowledge with field trial projects to promote sustainable and organic production.

The Roviana Conservation Foundation is implementing the *Roviana Climate Change Resilience Plan 2013–2017*, which was developed using PASAP research. The plan outlines activities to strengthen the people and the environment against the impacts of climate change.

A key activity that is helping Roviana people understand how sea-level rise will impact their communities is land-based surveying.

Dr Simon Albert, research fellow at The University of Queensland,



Researchers produced a book outlining community-based actions for Roviana to build its resilience against the impacts of climate change.

developed a unique surveying tool that allows remote communities to calculate which areas of land will be flooded by sea-level rise. This will help people plan new developments and building relocations.

He says: 'Sea-level rise is one of the critical threats that communities across the Pacific are facing. Communities don't have a good understanding of exactly when they will be inundated—are they 50 cm above sea level or are they 200 cm above sea level?'

'We have developed quite simple tools, using ground-based laser levels, that help guide basic planning of where to build a school or a church', says Dr Albert.

Other community-based activities happening in Roviana under the *Climate Change Resilience Plan* include:

- » replanting mangroves and corals
- » redesigning marine protected areas to increase connections between marine and coastal environments
- » establishing demonstration sites for new crop varieties
- » distributing new resistant varieties of staple crops
- » constructing seawalls to protect trees and houses
- » documenting the traditional knowledge of communities
- » holding regular meetings within community groups to raise awareness of climate change and resilience-building activities.



Photo: Econnect Communication

'We learn how to manage different varieties of plants, as well as plant pests and diseases. We plant different varieties of organic cassava and sweet potato, and save the seeds of the ones that are better for dry areas and others that are better for wet areas.'

Roviana team leader Sasamara Kera (*left*) and helper Bora Alen, Kastom Gaden Association



Photo: Econnect Communication

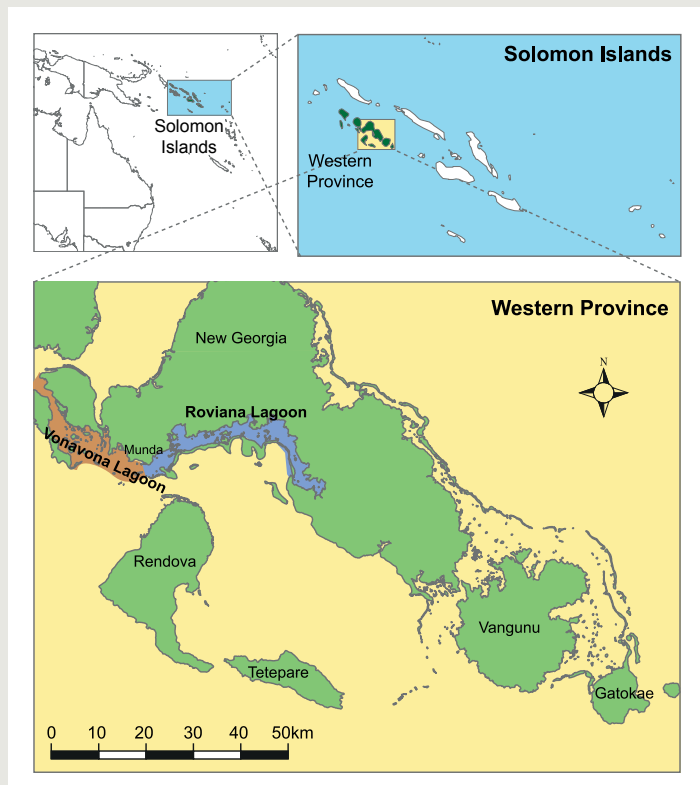
'We try to get people connected and supported, to address the problems farmers and remote communities are facing. We communicate with farmers about plant varieties and diseases using high-frequency radio and mobile phones.'

Claudine Watoto, national program Support Officer, Kastom Gaden Association

Fact file

Solomon Islands is both a Least Developed Country and a Small Island Developing State. It is located east of Papua New Guinea. It has a landmass of 28 000 square kilometres spread out over 992 islands, and an Exclusive Economic Zone of 1.6 million square kilometres.

The country's biodiversity is of global significance. Its reefs contain one of the highest diversities of coral and fish found anywhere in the world.



Roviana lagoon region in Solomon Islands. Source: The University of Queensland

Roviana region

Population: 17 000 people spread across 22 communities with about 20–300 people per village, and numerous smaller hamlets.

Area: 700 km², including 307 km² of lagoon area.

Geography: Volcanic islands that are influenced by tectonic uplift and subsidence, and tsunamis.

Education: Literacy levels less than 70 per cent.

Economy: Predominantly subsistence; commercial logging and fishing are increasing in the region.

Agricultural resources: Staple food crops are cassava, potato, banana, taro and yams.

Marine resources: Hundreds of fish and shellfish species are harvested from mangroves, lagoons, reefs and open ocean. Some key species include: parrotfish, wrasse, emperor, snapper, sweetlip and bream.

Climate: Tropical climate, with very little variation in seasonal air temperatures—annual average is 27 °C. There is a marked wet season from November to April. Average annual rainfall is about 4000 mm.

More information

The Australian Government's **Pacific Adaptation Strategy Assistance Program (PASAP)** assisted 15 Pacific island countries to assess their vulnerability to climate change and incorporate adaptive measures into planning and development.

For further information on the Solomon Islands community resilience or other PASAP projects, go to www.tiny.cc/t5axxw or contact InternationalAdaptation@climatechange.gov.au



Australian Government

Department of Industry, Innovation, Climate Change,
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