

# | Climate and Disaster Resilience



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## What is the risk?

- The Pacific region is one of the most exposed to natural hazards and climate change impacts in the world.
  - Natural disasters, weather extremes and projected changes in climate are increasingly recognized as major global development challenges.
- *Pacific Possible: Climate and Disaster Resilience* estimates the cost of adaptation to minimize potential climate change impacts and suggests policy actions for climate resilient development.

## Background

Pacific Island countries are among the most exposed to natural hazards and climate change impacts in the world, facing threats including devastating cyclones, floods, droughts and rising sea levels. Geographical remoteness and isolation, dispersion across the sea, economic and social challenges, and the degradation of natural resources are all factors that contribute to the high level of vulnerability faced by the people and economies of the Pacific.

*Pacific Possible: Climate and Disaster Resilience* considers adaptation strategies for a range of sectors and situations, including infrastructure and buildings, coastal protection, water resources, flooding and agriculture, with special consideration given to the unique challenges of atoll islands. The report considers the economic costs of adaptation and proposes priority investments and policies to the year 2040.

## Current Situation

**Disasters in the Pacific can cause substantial economic impacts,** with average annualized losses estimated to amount to 6.6% of gross domestic product (GDP) for Vanuatu and 4.4% of GDP for Tonga.

Since 1950, natural disasters in the Pacific region have:



affected approximately  
**9.2 million people**



caused around  
**10,000 reported deaths**



resulted in about  
**US\$5 billion** in associated damage costs

Pacific Island countries are grappling with multiple threats:



Tropical Cyclones



Floods and Droughts



Coastal Hazards



Tsunamis and Earthquakes



## The Outlook

The vulnerabilities the Pacific faces may be compounded by the impacts of climate change.

- Average ocean and land temperatures are increasing, and the seasonality and intensity of rainfall is changing, increasing the risk of floods and droughts.
- Over the coming decades, tropical cyclones are expected to increase in intensity.
- Because of higher ocean temperature and ice sheet melt, sea levels are rising, worsening coastal erosion and saline intrusion, and increasing the severity of storm surges.

The impacts of climate change are adversely affecting agriculture, coastal zones, water resources, health, infrastructure, agriculture, food security and ultimately the lives of all people living in the Pacific. Poorly planned development, poverty and environmental degradation can exacerbate the impacts of natural hazards and climate change, by increasing the **vulnerability** and **exposure** of those at risk.

**Targeted policies and investments can help to effectively manage Pacific Island countries' vulnerability - reducing damage, preventing losses, saving lives and protecting livelihoods and building resilience.**

## How can this be realized?

**Pacific Possible: Climate and Disaster Resilience provides recommendations for resilient development in the following sectors:**

- **Improving coastal protection**  
The cost of coastal adaptation will be high for the Pacific Islands by 2040, and an integrated approach is required with a combination of engineering and softer options, including ecosystem-based approaches, reduced sand mining, and better land use planning and coastal zone management.
- **Managing floods and water resources**  
Total annual rainfall is predicted to increase in most Pacific Island countries as a result of climate change, with wetter and dryer months requiring investment in increased water storage and rainwater harvesting for the dry months, and initiatives to minimize future flood risk during the wet months.
- **Adapting infrastructure to changes in rainfall and temperature**  
Most infrastructure types (e.g. health and school, power and telecommunication, water and sewers) will need to adapt to new temperature conditions and precipitation patterns. For roads, due to the high costs of adaptation and high uncertainty surrounding future changes in rainfall, optimum solutions will need to combine pre-emptive measures and strengthened preparedness.
- **Adapting buildings to increased tropical cyclone wind speeds**  
Ensuring new buildings and reconstruction activities are designed to withstand current and future cyclone wind speeds should be a high priority for policymakers. For existing buildings, a strategy for prioritizing retrofitting efforts is required, for instance, giving priority to key public buildings and emergency shelters.
- **Adapting the agriculture sector**  
Increased temperatures and greater risk of seasonal droughts may lead to a decrease in crop productivity and negatively affect livestock in some countries, requiring innovative ways to improve productivity yield and boost resilience, such as the development of new climate smart varieties.
- **The case of Atoll Islands**  
Atoll nations such as Kiribati, Marshall Islands and Tuvalu are particularly vulnerable to sea level rise and storm surges. The costs of adaptation will be significant and long term engagement with the international community will likely be essential.

**> Exposure, vulnerability and hazards have to be managed collectively to minimize future risks from extreme weather events and climate change.**

# WHAT IS Pacific Possible?



Pacific Island countries face unique development challenges. They are far away from major markets, often with small populations spread across many islands and vast distances, and are at the forefront of climate change and its impacts. Because of this, much research has focused on the challenges and constraints faced by Pacific Island countries, and finding ways to respond to these.

This paper is one part of the Pacific Possible series, which takes a positive focus, looking at genuinely transformative opportunities

that exist for Pacific Island countries over the next 25 years and identifies the region's biggest challenges that require urgent action.

Realizing these opportunities will often require collaboration not only between Pacific Island governments, but also with neighbouring countries on the Pacific Rim. The findings presented in Pacific Possible will provide governments and policy-makers with specific insights into what each area could mean for the economy, for employment, for government income and spending.

## LEARN MORE

To learn more, visit [www.worldbank.org/PacificPossible](http://www.worldbank.org/PacificPossible), or join the conversation online with the hashtag #PacificPossible.