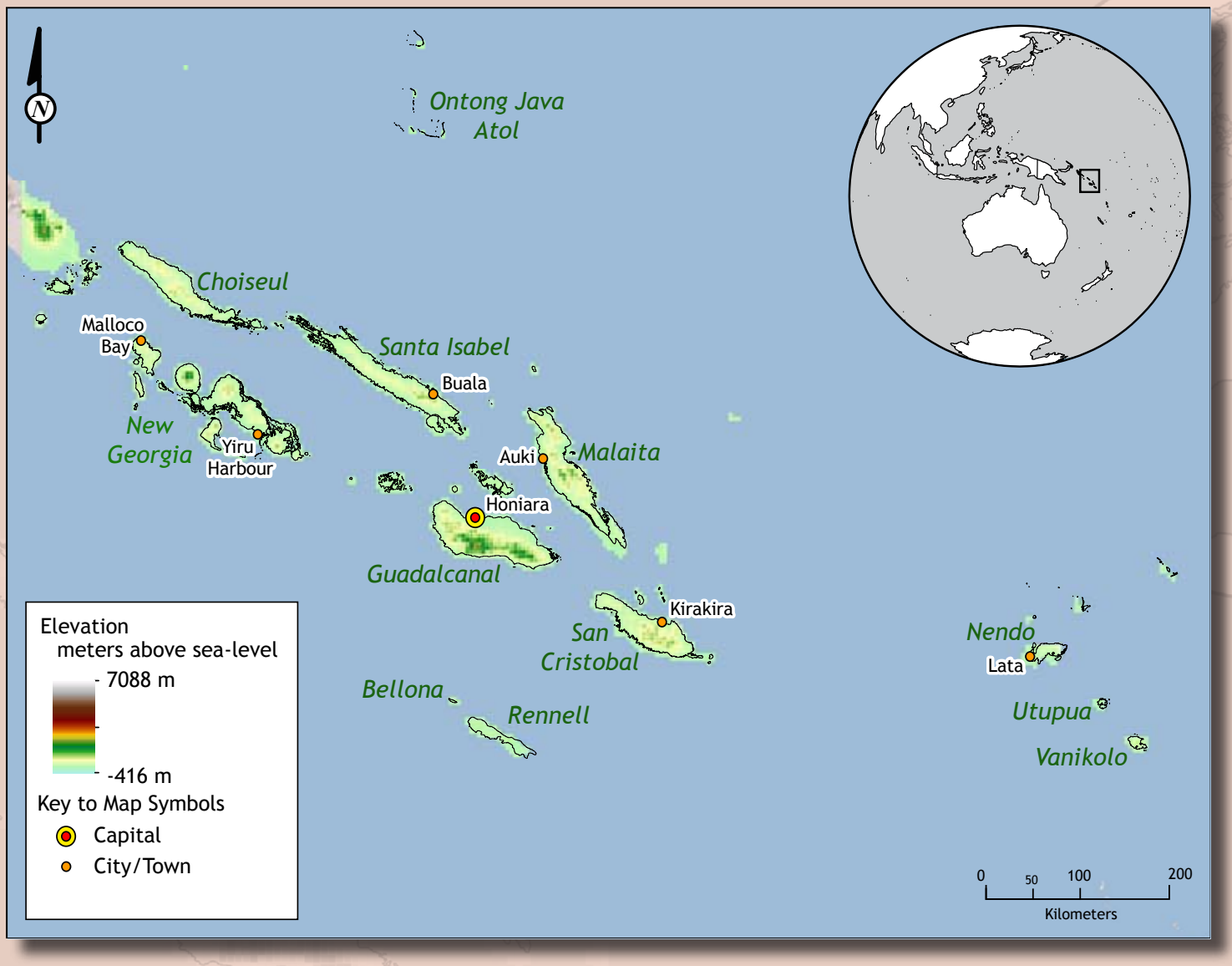
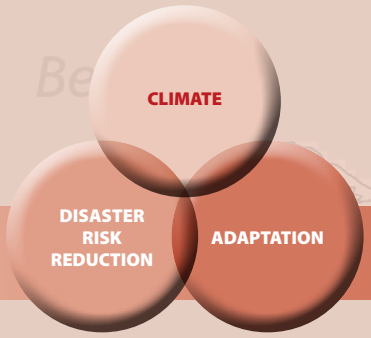


Vulnerability, Risk Reduction, and Adaptation to Climate Change



SOLOMON ISLANDS

GFDRR
Global Facility for Disaster Reduction and Recovery

Climate Change Team ENV

COUNTRY OVERVIEW

The Solomon Islands are an archipelago located in the Melanesian region of the Pacific, south-east of Papua New Guinea. The Archipelago consists of 992 small islands that cover approximately 27,000 square kilometers (km^2), and a sea area of 1.35 million km^2 dispersed between 7 and 12 degrees south of the equator and 156 and 170 degrees longitude. Considered the "Amazon of the Seas", the country's expansive area covers a unique geographical environment of atolls, mountains, and salt-water lagoons, and has one of the world's richest marine diversity, including 75% of the known coral species, more than 30% of the world's coral reefs, 40% of the coral reef species, and the largest mangrove forest in the world[1]. Of the 523,170 inhabitants, most live in rural areas (~80%)[2], in contrast to the rest of East Asia and the Pacific (with rural populations of 60%). Agriculture, forestry, and fishing are the mainstay of the economy, with agriculture contributing nearly 36% of GDP in 2006. Other important revenue activities in the Solomon Islands include timber, fish, copra[3], cocoa, and palm oil, which together with agriculture account for between 80-90% of the country's revenue.

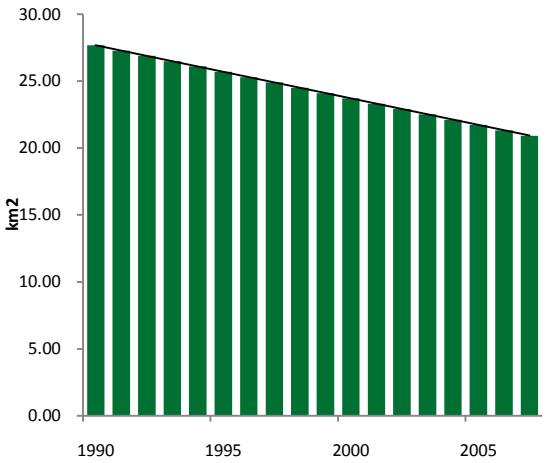


Figure 1: Forest area in the Solomon Islands, 1999-2007.

Source: World Bank

Land degradation and deforestation is a serious concern in the Solomon Islands; less than 1% of the country's heavily forested ecosystems are protected, and logging is a critical source of revenue for the country, leading to significant deforestation rates that by 2015 could exhaust the country's forest resources[4] with attendant impacts of loss of biodiversity, rural employment, foreign earnings, and government revenue (Figure 1).

The Solomon Islands, like all Small Island Developing States (SIDS), have been identified as one of the most vulnerable to the adverse impacts of climate change. This vulnerability designation is in large part due to the fact that the majority of the population lives within 1.5 km of the coastline, rendering a considerable portion of the country's economy, infrastructure, and livelihoods vulnerable to changes in climate. In addition, high poverty rates (22.4% in 2008), excessive dependence on foreign aid, and remoteness make the Solomon Islands particularly vulnerable to climate variability and change.

[1] Permanent Mission of Solomon Islands to the United Nation. Solomon Islands National Submission on Climate Change and Possible Security Implications. Submission to the 64th Session of the UN General Assembly.
[2] World Bank, 2008
[3] Copra is the dried flesh of coconut.
[4] National Forest Resource Assessment Update, AusAID 2006.

PRIORITY ADAPTATION MEASURES

Key Sectors
Agriculture (Especially subsistence)
Water Resources
Coastal Resources
Human health
Energy

Source: Solomon Islands National Adaptation Programme of Action, 2008

According to the Solomon Islands National Adaptation Programme of Action, climate change is the most important developmental and environmental issue for the country and poses a significant impediment towards meeting its development goals. While the country continues to enjoy significant and robust growth rates, all sectors of the economy are projected to be negatively impacted by a changing climate, and the costs of adaptation are expected to be disproportionately high relative to the GDP.

Climate change impacts are already being felt across the Solomon Islands archipelago, including increased intensity and frequency of extreme events such as droughts, cyclones, and rising sea levels. Some of the country's smaller atolls, such as Ontong Java, are already suffering the impacts of salt-water intrusion, storm surges, and flooding. Taro and other tuber yields have also been reduced in the coastal lowlands of Makira by storm surges and warmer temperatures. These adverse impacts are projected to increase in response to a changing climate.

CLIMATE BASELINE AND CLIMATE FUTURE

CLIMATE BASELINE

The Solomon Islands have a warm, tropical climate year round. Temperatures across the country range between 23-31°C and precipitation ranges between 3000-5000 millimeters (mm) annually, although the most intense part of the rainy season occurs during the north-westerly monsoonal winds that bring tropical cyclones across the archipelago between December-March. El Nino Southern Oscillation (ENSO) is an important driver of climate, heavily influencing periods of drought and the risk of floods and also the frequency of tropical cyclones[5]. Climate in this part of the Pacific is governed by a number of factors that include the trade winds and the movement of the South Pacific Convergence Zone (SPCZ), a zone of high-pressure rainfall that migrates across the Pacific south of the equator. Year-to-year variability in climate is also strongly influenced by the El Niño conditions in the south-east Pacific, which bring drought conditions to the Solomon Islands.

RECENT CLIMATE TRENDS

Climate baseline summary for the Solomon Islands and the Pacific in general:

- Mean temperatures across the South Pacific have increased by approximately 1°C since 1970, at an average rate of 0.3°C per decade.

[5] GFDRR, 2011. Solomon Islands Climate Change and Disaster Risk Profile.

- From 1994 to 2008, sea levels rose by 7.6 mm/year in the Solomon Islands. Satellite measurements in this area of the Pacific estimate sea-level increases of 8-10 mm/year, approximately three times the global average rate of increase. Precise barometric-pressure corrected sea-level changes indicate a trend of +3.5 mm/year, while longer gauging records of less precision suggest a decreased sea level of -2.21 mm/year.
- Observed rainfall from seven meteorological stations across the Solomon Islands show a decreasing trend[6], but a longer time period of observations is required in order to derive statistical significance from these.
- Sea surface temperatures in the Pacific have increased between 0.6 to 1.0°C since 1910, with the most significant warming occurring after the 1970s[7].
- The number of category 4 and 5 storms in the Pacific region have more than doubled when compared to their frequency and occurrences between 1975-1989 and 1990-2004.
- The numbers of hot days and hot nights[8] have increased significantly across the Pacific.

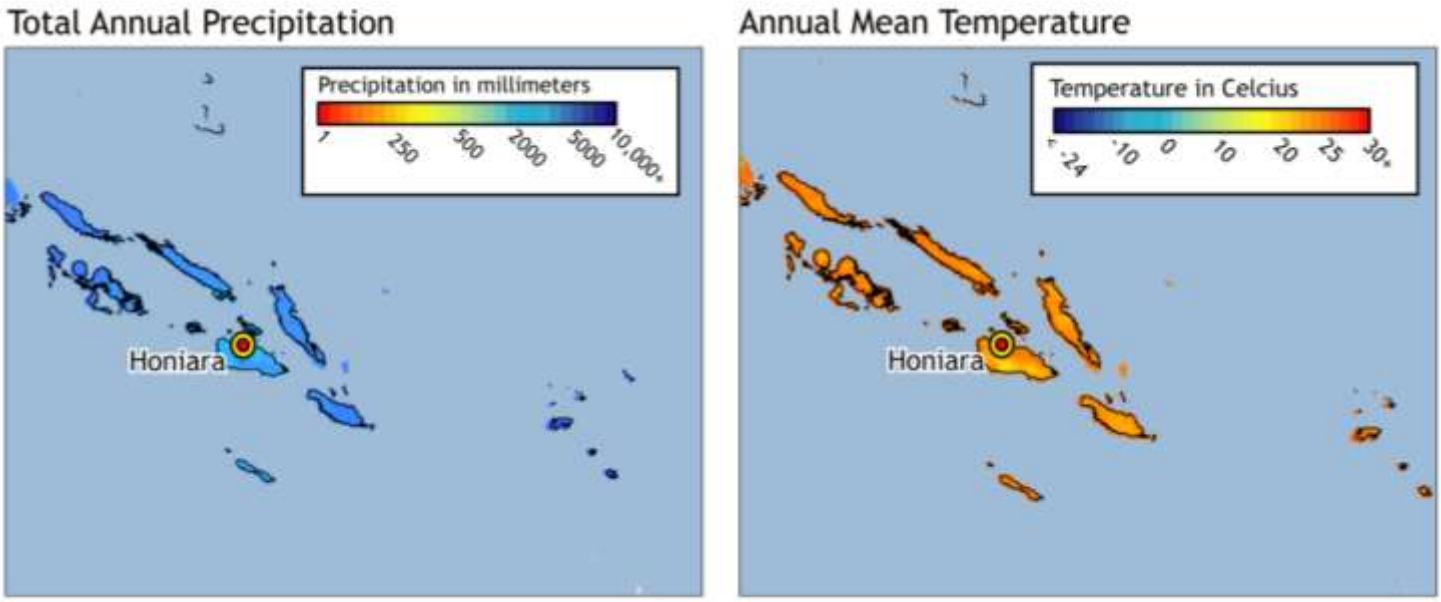


Figure 2: Annual climate baseline for the Solomon Islands.[9]

[6] Solomon Islands National Adaptation Programme of Action, 2008.

[7] Folland, C.K., J.A. Renwick, M.J. Salinger, N. Jiang, and N.A. Rayner, 2003: Trends and variations in South Pacific Islands and ocean surface temperatures. *Journal of Climate*., 16, 2859-2874 and Folland, C.K., J.A. Renwick, M.J. Salinger, and A.B. Mullan, 2002: Relative influences of the Interdecadal Pacific Oscillation and ENSO on the South Pacific Convergence. Zone. *Geophysical Research Letters*, 29, 21-1-21-4.

[8] Hot days/nights are defined as the temperature exceeded on 10% of days or nights in current climate of that region and season.

[9] Worldclim 1960-1990 Averages. Robert J. Hijmans, Susan Cameron, and Juan Parra, at the Museum of Vertebrate Zoology, University of California, Berkeley, in Collaboration with Peter Jones and Andrew Jarvis (CIAT), and with Karen Richardson (Rainforest CRC). www.worldclim.org/current.

CLIMATE FUTURE

The climate science community sources a suite of models to inform decision makers on future climate. Among the most widely used are GCMs (Global Climate Models), RCMs (Regional Climate Models), and downscaling techniques (both empirical and statistical), and several comprehensive reviews are available on the subject. GCMs are our primary source of information about future climate. They comprise of simplified but systematically rigorous interacting mathematical descriptions of important physical and chemical processes governing climate, including the role of the atmosphere, land, oceans, and biological processes. Unfortunately, the Solomon Islands, as all small island nations, face specific challenges when viewing the projected changes from these models. This "island dilemma" is attributable to the fact that single grid cell values from GCMs are considered by the Intergovernmental Panel on Climate Change (IPCC) (2007) as the least accurate measure of projected changes, and the relatively spatial resolution of GCMs renders interpretation of climate change in small island nations difficult. The following insights into a changing climate are thus derived for the Pacific region as a whole, rather than for the Solomon Islands specifically, from a suite of GCMs used by the IPCC:

- The future of rainfall patterns across the Pacific region is a subject of continued debate, with models projecting +/-25% changes in rainfall. As of yet, it is not possible to get a clear picture for precipitation change, due to large model uncertainties.
- While average annual and monthly rainfall changes are inconsistent across this region of the Pacific, recent evidence and model simulations point to a more frequent occurrence of El Nino weather patterns, bringing an increase in drought conditions along this region. These more frequent El Nino events are believed to be associated with climate change, although some disagreement exists within the science community on this point.
- More frequent El Nino events could also increase the intensity of tropical cyclones along the Pacific, with important implications for disaster management and response in the Solomon Islands.
- Temperatures in the Pacific are projected to increase between 1.4 and 3.1^{o}C. Sea levels are projected to rise by the end of the century by 0.35 m (0.23 to 0.47 m, although the spatial manifestation of this rise will not be uniform due to circulation changes and ocean density.

Secondary impacts from the above changes in climate are discussed throughout this document, and include, among others:

- Increased coastal erosion and loss of soil fertility.
- Saltwater intrusion into areas critical to sustaining food security.
- Damage to coral reefs and fisheries, including depletion of fish stocks.
- Damage to coastal wetlands.
- Loss of biodiversity, forests, and unique mangroves.
- Loss of water quality and quantity.
- Increase in disease incidence.

CLIMATE CHANGE IMPACTS ON NATURAL HAZARD VULNERABILITY

AT A GLANCE

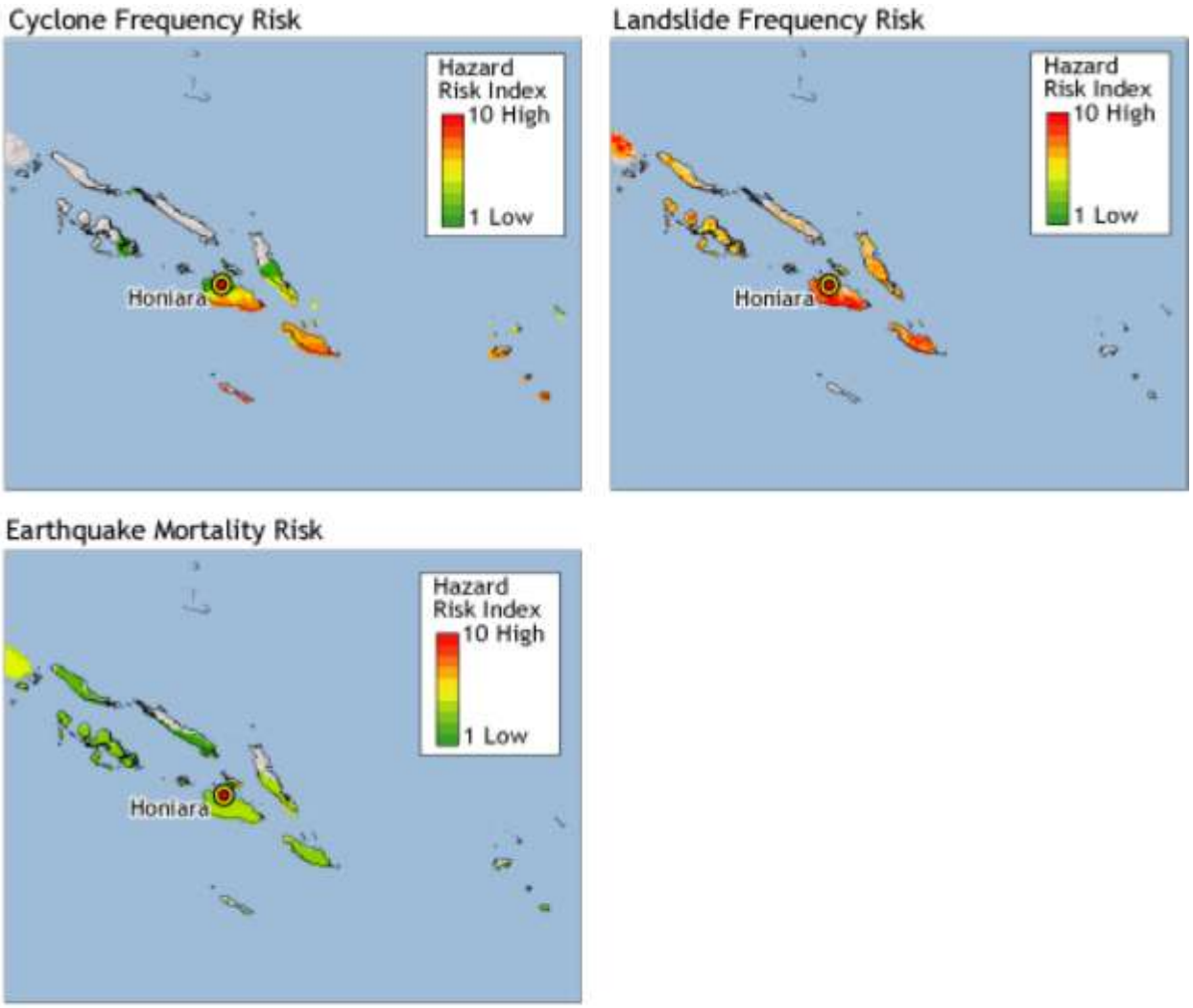


Figure 3: Exposure to climate-related hazards across the Solomon Islands[10][11]

[10] Columbia University Center for Hazards and Risk Research (CHRR) and Columbia University Center for International Earth Science Information Network (CIESIN).

[11] Note that for the purposes of this assessment of disasters, a global disasters database was used. However, more detailed maps on the distributional impacts of disasters in the Pacific are available, and where possible, will be made available also on the forthcoming GFDRR Solomon Islands Dashboard.

Climate-related hazards in the Solomon Islands include tropical cyclones, flash floods, droughts, sea-level rise, and extreme events related to increasing sea surface temperatures (Figure 4). These hazards can pose serious constraints on development in small islands, which are often viewed as being in "constant recovery mode". A comprehensive review of climate-related hazards is available in the 2011 Global Fund for Disaster Risk Reduction Solomon Islands Risk Profile. These are summarized below:

- **Tropical Cyclones**—Tropical cyclones are perhaps the most devastating natural disasters, both because of the loss of human life and the large economic losses they cause across the Pacific. The Solomon Islands generally experience two tropical cyclones per year, with the southern and eastern provinces especially vulnerable[12]. In 2002, cyclone Zoe, a category 5 cyclone, struck the remote islands of Tikopia and Anuta in the Temotu province, causing significant economic damage (~US$1million) and significant disruptions to the areas of food, water, health, education, and environment. The small sizes of many of the Solomon Islands make them vulnerable to cyclone damage, although evidence suggests that the southern, windward facing segments are more at risk from cyclonic damage. Cyclone season in the Solomon Islands extends from December to February and is driven by monsoonal rainfall and increased sea surface temperatures. Tropical cyclone formation and intensity change are currently very difficult to predict, and according to the IPCC's Fourth Assessment Report there is insufficient information on future sea surface temperatures to determine the regional distribution of cyclone changes and their response to potential changes in greenhouse gas conditions.

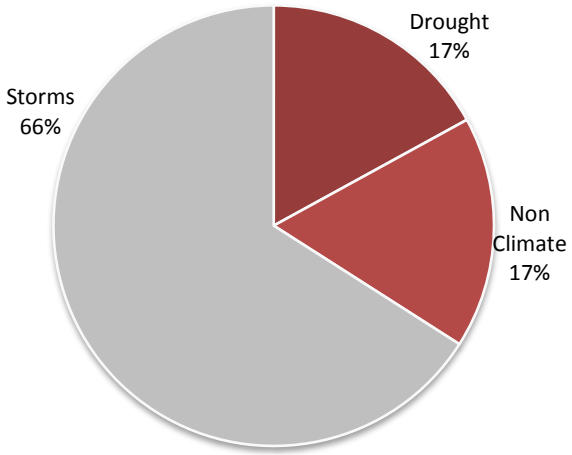


Figure 4: Average distribution of disasters each year in the Solomon Islands, 1982-2007.

- **Drought/Dry Spells**—The Solomon Islands experience drought episodes during the warm phase of the El Niño Southern Oscillation. The 1998 El Niño-induced droughts affected over 40000 people across the archipelago and led to significant water crises on smaller and more remote atolls such as South Guadalcanal, Malaita, and the Western province, which have limited freshwater lenses and rainwater-harvesting capacity and high costs to serve from the central government. More frequent El Niño events could also increase the intensity of tropical cyclones along the Pacific, with important implications for disaster management and response in the Solomon Islands.

- **Extreme events**—Increased sea surface temperatures have already affected critical mangrove habitats and the nutrient supply of key reefs through coral bleaching, particularly during warm-phase ENSO episodes. These reefs support a significant diversity of species and are an

[12] GFDRR, 2011. Solomon Islands Climate Change and Disaster Risk Profile.

important source of food and economic security for much of the country's population. The degree of future increase in sea surface temperatures remains a subject of debate, but increases are projected and any increase that exceeds 29.5 ^{o}C (a critical threshold for the survival of coral) could have catastrophic impacts on the livelihoods of those who depend on these fragile fisheries. Moreover, increased cyclone intensity could make fishing unsafe for those areas affected.

- **Floods**—Floods in the Solomon Islands are primarily caused by extreme rainfall events hitting steep and small catchments. Of the top 10 natural disasters reported in the Solomon Islands between 1982 and 2007, seven of these were due to storm damage, and in 1986, these affected over 150,000 people across the Solomon Islands, killing 100 and causing damages of over US$20million. With increasing deforestation, poor water management infrastructure to address flood damages, and a lack of meteorological and gauging stations in critical streams and rivers of the archipelago, these damages are projected to increase. Floods are particularly damaging in the southern islands of Guadalcanal, Makira, and Malaita. Flooding can also occur as a result of a combination of factors, including king tides, areas associated with low atmospheric pressure, and rising sea levels[13]. When these factors are combined with heavy rainfall, coastal flooding and inundation can result, as occurred in December 2008 across areas of the Pacific, including parts of the Solomon Islands.

- **Sea-level rise**—The majority of the people, agricultural lands, and infrastructure in Solomon Islands are concentrated along the coasts, and are thus especially vulnerable to any rise in sea level. According to the IPCC's Fourth Assessment report, sea levels have risen globally 1.8 mm per year, and are projected to rise by 0.18-0.59 m by 2100. However, more recent estimates, accounting for thermal expansion of oceans and the measured increase in the melting of sea ice, suggest that the problems could be much worse. Determining how severe the impacts of sea level might be is a complicated process, particularly in areas such as the Solomon Islands where limited bathymetric data exist and long-term gauging stations are non-existent. Anecdotal evidence from several locations across the Solomon Islands' archipelago, however, suggest increased salt-water intrusion into the freshwater lens of the country's smaller atolls, increased infrastructure damage from rising tides and storm surges, particularly in the capital city of Honiaria, and increased levels of coastal erosion. Coastal erosion is already a reality on the main islands of Liuaniua and Pelau, where many homes have been relocated. The impacts of sea-level rise are, furthermore, exacerbated by the removal of mangroves to have better access to the sea, the building of a causeway, and tectonic subduction.

SECTORAL CLIMATE RISK REDUCTION RECOMMENDATIONS

Climate variability and change have and will continue to affect the Solomon Islands. Vulnerability is a key factor that needs to be considered to identify the differential impacts of climate. The poor have

[13] GFDRR, 2011. Solomon Islands Climate Change and Disaster Risk Profile.

limited access to services necessary to make them resilient to adverse climate effects and their living conditions are often affected by laws, policies, and economic forces over which they have little or no control. Although it is by no means clear whether vulnerable groups, with their pressures to survive, or affluent groups, with their pressures to consume, ultimately lead to the impacts that continue to drive vulnerability, it seems clear that there are challenges in meeting the Millennium Development Goals if this requires the poor to look beyond their immediate needs. The most profound impacts of climate variability and change in the Solomon Islands will be felt in the sectors discussed below: agriculture and food security, water resources, coastal resources, and human health.

AGRICULTURE

Agriculture, particularly for subsistence crop production, is a primary source of food security in the Solomon Islands. Crops such as yams (*Dioscorea spp*.), taro (*Colocasia esculenta*), and sweet potatoes (*Ipomoea batata*) and other crops such as bananas (*Musa spp.)* and watermelon (*Citrullus lanatus*) are still part of people's main staple diet, and production is heavily dependent on rainfall. The agriculture sector employs 75% of the country's population and contributes 42% to the country's GDP. Although topographic diversity of the Solomon Islands includes hills and mountainous terrain, most of the country's agricultural activities are conducted in the coastal plains of the country. These coastal areas are particularly vulnerable to the impacts of cyclones and salt-water intrusion. Cyclones can damage agriculture through intense winds and flooding, as in 1986, when cyclone Nanu significantly affected the country's palm oil and rice production. Coastal erosion and increased intensity of storm surges could impact agricultural productivity across the low-lying areas of the country.

Agriculture plays an increasingly significant role in the country's economy, particularly with palm oil and cocoa, and small farming units are slowly beginning to transition from subsistence to the production of cash crops, forcing many towards reducing fallow periods[14] and migrating to more marginal lands and steep hillsides, increasing deforestation and soil erosion, with implications for water quality. This transition can also lead to the loss of traditional farming techniques – techniques that are potentially critical to adapting to changing climatic conditions. Reduced water availability during dry periods could exacerbate agricultural water needs, and already much of the country relies on water from rains of the monsoons to sustain productivity.

Salt-water intrusion into inland gardens (primarily for taro production) has already begun to affect some regions of the country (e.g. Ontong Java), making tubers yellow and bitter and rendering them unsuitable for consumption.

Adaptation activities in the agriculture sector should focus on the following:

- Strengthening farming techniques, particularly on steep hillsides to reduce soil erosion.
- Developing salt- and/or drought-tolerant crop species.

[14] According to the Solomon Island's National Adaptation Programme of Action, 2008, fallow periods have decreased from 15-20 years to 5 years.

- Strengthening the country's agricultural extension services and rapid response centers to address disease and pest outbreaks more effectively.
- Strengthening the capacity of the country's meteorological services to produce and distribute weather forecasts particular to agriculture.

Water Resources

According to the World Bank, over 70% of the people in the Solomon Islands in 2008 had access to improved water and sanitation. As with many other island nations, however, the Solomon Islands have uniquely fragile water resources due to their small size, lack of storage, and limited fresh water. The country's Water Resources Programme has paid limited attention to water management and infrastructure rehabilitation for water and waste water, and this is also hampered by the typical constraints of small island nations (i.e. isolation, fragile natural variability, and a limited human, financial, and capital resource base). Furthermore, almost no attention has been paid to the potential effects of climate-related extremes on current water resources, especially with regards to salt-water intrusion. Anecdotal evidence suggests that water crises during El Niño-driven droughts are becoming increasingly common on smaller and more remote atolls such as the South Guadalcanal, Malaita, and Western province, which have limited freshwater lenses and rainwater-harvesting capacity, and high costs to serve from the central government.

Adaptation options in the water sector outlined in the country's NAPA include:

- Building flexibility into the water-provisioning systems to address future climate change.
- Improving water management infrastructure and planning.
- Increasing water use efficiency in the agriculture sector.

Coastal Resources

Coastal resources harbor a critically important spawning habitat for a wide diversity of fish, many of which are critical to the food security across the Solomon Islands. Mangrove degradation, as well as loss of seagrass beds and coral bleaching, has occurred in many parts of the Solomon Islands' archipelago. A major impact of this has been the measured decrease in fish stocks and the elimination of natural protective barriers from storm surges. Furthermore, tuna, an important economic resource for the Solomon Islands, are known for their sensitivity to changing sea surface temperatures, and the country's catch in the 1997/98 El Niño episode clearly saw a reduction.

The coastal zones are also where a large majority of the country's population and, therefore, livelihood activities and services, are located. Coastal erosion from increased intensity in storm surges is already evident in many parts of the archipelago. In the Gizo province, for example, the roads in the Malakarava village have been washed off, and runoff has increased the hazards in steep areas. Loss of mangroves as well as, loss of and/or poorly managed infrastructure – 80% of the roads are categorized as deteriorated, and approximately 37% of the countries bridges require major repair –make the country's coastal areas particularly vulnerable.

HUMAN HEALTH

The Solomon Islands' public health sector is vulnerable to climate variability and change, particularly with regard to the increased incidences of nutritional deficiencies due to lower crop yields and diarrheal and vector-borne diseases. Limited information is available on the extent and frequency of any health issues, let alone those with a significant link to climate variability and change, but anecdotal evidence on reduced water quality and warmer temperatures point to a potentially deteriorating condition in the health sector under a changing climate. Anecdotal evidence is also emerging that indicates a more widespread and frequent occurrence of mosquito-borne diseases such as malaria in the highlands of the country, where once was too cold for mosquito reproduction.

Furthermore, addressing the impacts of climate variability and change on the health sector requires addressing issues of poverty, sanitation, nutrition, and environmental degradation, all of which significantly hamper a community's capacity to adapt to vulnerability. Adaptation recommendations in the health sector, identified in the National Adaptation Programme of Action, 2008, include:

- Developing a repository of the potential incidences of climate-related diseases, including research that establishes causal linkages between meteorological data and these.
- Awareness-raising activities on the potential impacts of climate change on health, including projected changes in the outbreaks of water- and insect-borne diseases, as well as appropriate response mechanisms for dealing with these.

ADAPTATION

A number of climate change projects and activities have been carried out in the Solomon Islands, many of which are set to offer significant insights and experiences on current and potential adaptation strategies for addressing climate change risks in the country. Some of these are listed below.

Ongoing Efforts—At a Glance

Vulnerability Reduction Projects	*Description*
Pacific Islands Climate change Assistance Programme (PICCAP)	A multi-country regional enabling activity project funded by the GEF, implemented by UNDP, and executed by SPREP to assist participating countries to prepare their initial communications under the UNFCCC.
Pacific Adaptation to Climate Change Project (PACC)	A program to assist with the implementation of adaptation measures in 11 countries of the region. Solomon Islands, as one of the participant countries, will participate in the PACC to implement adaptation measures to enhance its resilience to the adverse impacts of climate change in the longer term.
Development of Sustainable Agriculture in the Pacific (DSAP)	Pilot programs to improve farming system management in three provinces (Makira, Western, and Malaita), where the focus is on main/staple food crops such as sweet potato, yams, cassava, taro, and rice.

Studies	
South Pacific Sea Level and Climate Monitoring Project	A program that sets up high-resolution monitoring stations in eleven island countries to measure the relative motions of land and sea at each station. These data will assist in the long-term calibration of satellite altimetry and radio astronomy and provide a measure of regional vertical control, and exchange information and data with national, regional, and international climate change centers. This will help the understanding of the complex problem of measuring changes in sea levels. The project also assists with information exchange and holds two-week training courses on the use of oceanographic, atmospheric, and climate data in social and economic decision making.
GFDRR Interventions	
Comprehensive Disaster Risk Management Programme for the Solomon Islands(2010-2012)	This programme takes stock of overall DRM situation in the country, fleshes out its main DRM needs, and presents indicative new programmatic areas and projects for GFDRR funding over the next three years. It includes an extensive climate risk profile to be published in 2011.

EXISTING ADAPTATION FRAMEWORK/STRATEGY/POLICY AND INSTITUTIONAL SETUP

AT A GLANCE

The Solomon Islands, like all Small Island Developing States (SIDS), has been identified as one of the most vulnerable to the adverse impacts of climate change. This vulnerability is amplified by the fact that development activities have outpaced traditional conservation and coping practices. While it is clear that climate impacts are already being felt across the country, a specific climate change focus has been missing from many of the current development activities. A number of institutions across the country are actively engaged in activities that should address climate change considerations, but additional work needs to be done.

Representative Institutions

Governmental	*Role*
Ministry of Environment, Climate Change, Disaster Management and Meteorology (MECM)	UNFCCC Focal Point, including leading the country's National Adaptation Programme of Action and National Communications. The newly formed Climate Change Division is responsible for preparing a national policy on climate change.
Water Resources Division (WRD)	A division of the Department of Mines and Energy responsible for water assessment.

Department of Transportation and Works	A division of the Department of Transport, Works and Public Utilities, responsible for the building of wharves in many cyclone-prone areas of the country and the construction of bridges.
Ministry of Agriculture and Livestock (MAL)	Responsible for food production and food security in the Solomon Islands. Also the executing agency for the proposed UNDP Adaptation Fund project on food security and current PACC Project.
Solomon Islands Water Authority (SIWA)	Responsible for supply of water in urban areas of the country.
National Disaster Management Office	Undertakes assessments of vulnerability to disasters across the Solomon Islands, as well as food security, and is in charge of response mechanisms. Given the relatively high capacity of the NDMO, it also facilitates inter-ministry capacity strengthening and information and skills exchange between agencies.
Department of Development Planning and Finance	Operational focal point on rural development focus with strong collaboration with the Ministry of Agriculture to develop a broad framework for food and food security.

INSTITUTIONAL AND POLICY GAPS

- According to the Global Fund for Disaster Risk Reduction's 2011 Climate Change Profile, capacity (terms of human resources, technical and financial capacity) in key government roles and institutions is lacking, as is donor coordination. Both of these issues need to be addressed in order to support the government in addressing its climate change risks.
- The limited integration of climate change considerations into current development activities needs to be addressed by strengthening coordination among the country's relevant institutions.
- Responding to climate change requires that a significant effort is made to raise education activities and awareness regarding current and projected climate variability and change. Integrating climate change into formal education curricula, as well as community awareness programs, could help in meeting these goals.
- The technical and financial capacity of existing institutions needs to be augmented to address the needs of the country's more remote islands.
- Legislative policies and development activities need to take into account climate change. For example, according to the Department of Transportation and Public Works, existing infrastructure projects, including wharf and bridge building, need to be properly climate-proofed to deal with projected climate risks.
- Support to the newly formed Climate Change Division within the Ministry of Environment is highlighted in the 2011 GFDRR Climate Change Profile for the Solomon Islands:

- *Climate Change Advisor*: To operationalize the impending climate change policy and to build capacity within the whole Climate Change Division
- *Climate Change Coordinator*: To manage and provide support to climate change projects, including dealing with new donor proposals relating to climate change.
- *Climate Change Adaptation Specialist*: Expertise and skills in implementing climate change adaptation projects.
- *Climate change mainstreaming specialist*: Provide advice across ministries on how to actually "do" mainstreaming. Capacity building across government and awareness raising on climate change issues. (Possibly undertaken by Climate Change Coordinator.)

Research, Data, and Information Gaps

The Solomon Islands, like all small island states, faces a unique set of challenges in dealing with climate variability and change. While a number of climate change and adaptation activities are ongoing, the country's official communications to the United Nations Framework Convention on Climate Change (UNFCCC) point to significant research, data, and information gaps that will need to be addressed in light of projected changes in climate[15].

Research Gaps

- Responding to climate change in the health sector is hampered by a limited understanding and awareness of climate change. Research is desperately required on the links between climate change and diseases in the context of small islands, including the collection of a robust baseline datasets that offer a village perspective on current and potential impacts. Furthermore, education and awareness activities that address the country's unique cultural diversity are required.
- Detailed assessments of climate change impacts and risks focusing on food security, water resources, and coastal resources are required. Water supply and demand studies need to be conducted across the country. Currently, the only available one of such detailed assessments is the one conducted by the Water Resources Department in Honiaria, and this needs to be expanded to other critical urban areas in order to appropriately address issues and problems with water resources management and the development of an integrated coastal management plan.
- Almost no work has been done to downscale climate models to individual islands. Realistically, it may not be possible to derive more accurate climate change information due to the small size of these islands; however, more work needs to be done to address the "island dilemma". New information should be credible and useful to decision making at the island scale.

[15] Pacific Adaptation to Climate Change Solomon Islands, Report of In-Country Consultations.

- A very limited instrumental record makes extensive analyses of the natural variability of cyclones difficult to assess. Establishing a robust observation network is a critical first step towards addressing potential cyclone risks.

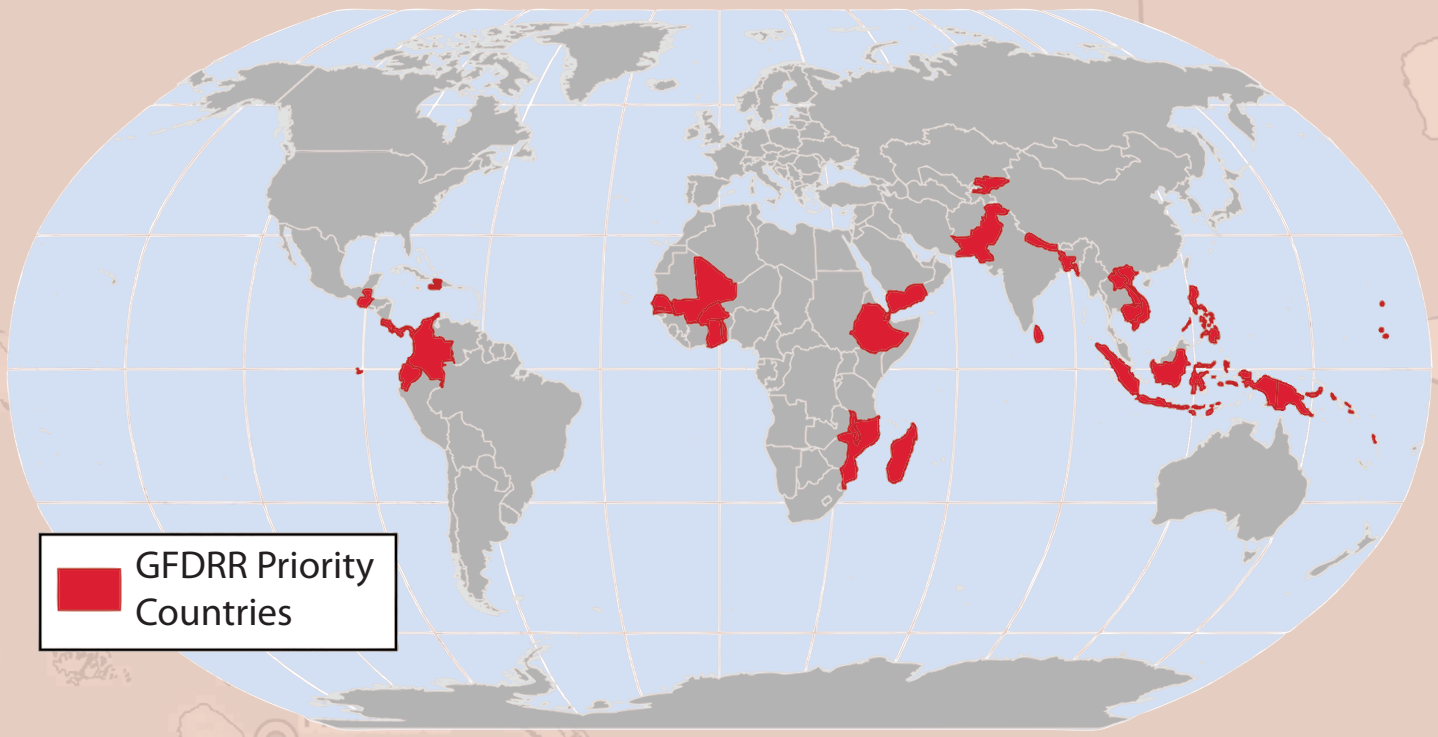
DATA AND INFORMATION GAPS

The Solomon Islands faces many challenges in addressing climate change risks, including insufficient resources and lack of institutional capacity as noted above. Additionally, lack of specific information and data on current and future vulnerability and risks across the country hamper the country's ability to respond to current and future climate risks. Among these are:

- A general lack of sector-specific data, including on fisheries and agriculture, which needs to be addressed in order to develop appropriate response measures.
- Technical capacity and human resources are also lacking in terms of spatial data in the National Disaster Management Office. There is a clear need within the NDMO and across government more broadly to develop a GIS spatial database that would assist the work of numerous initiatives and coordination on a national scale[16].
- Anecdotal evidence of changes in climate need to be formally catalogued across the country. For example, there is evidence that water quality and quantity is being reduced, but these dynamics are not well understood due to a limited understanding of the country's hydrometeorological systems. In many cases, there are no weather monitoring sites that could provide key information on flash floods and water flows to managers downstream.
- Addressing sea level and storm surge risks will require the use and interpretation of the information that is coming out of the South Pacific Sea Level and Climate Monitoring Project, listed above.
- The use of existing meteorological information is limited to specific agencies, and this information needs to be tailored to decision makers across a wider series of sectors, including water resources management. This may improve as the new Climate Change Division evolves, but as noted above, this should be supported.

[16] GFDRR, 2011. Solomon Islands Climate Change and Disaster Risk Profile.

This Country Profile *(**http://countryadaptationprofiles.gfdrr.org**) is part of a series of 31 priority country briefs developed by the Global Facility for Disaster Reduction and Recovery (GFDRR) as part of its Disaster Risk Management Plans. The profile synthesizes most relevant data and information for Disaster Risk Reduction and Adaptation to Climate Change and is designed as a quick reference source for development practitioners to better integrate climate resilience in development planning and operations. Sources on climate and climate-related information are linked through the country profile's online dashboard, which is periodically updated to reflect the most recent publicly available climate analysis.*



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