Review of Current and Planned Adaptation Action: The Pacific

Cook Islands, Federated States of Micronesia, Fiji, Kiribati, Marshall Islands, Nauru, Niue, Palau, Papua New Guinea, Samoa, Solomon Islands, Tonga, Tuvalu and Vanuatu

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About the Adaptation Partnership

The Adaptation Partnership was formed in May 2010 in response to a recognized need for development practitioners to share information and lessons on adaptation efforts. Chaired by Costa Rica, Spain and the United States, the goal of the partnership is to encourage effective adaptation by serving as an interim platform to catalyze action and foster communication among the various institutions and actors engaged in the effort to scale up adaptation and resilience around the world, particularly in the context of fast start finance. The Partnership is synthesizes lessons learned and good practices, highlighting needs and priorities, and identifying opportunities for cooperation and alignment of support to build resilience to the adverse effects of climate change. It is also enhancing communities of practice engaged in the adaptation effort.

Adaptation Partnership
Website: http://www.adaptationpartnership.org/

Foreword

In response to a growing awareness of the potential adverse effects of climate change and the particular vulnerability of developing countries to this process, a significant increase in adaptation action has been witnessed in recent years in Africa, Asia-Pacific, and Latin America and the Caribbean. These actions are providing opportunities to: increase understanding of the implications of climate change for the achievement of development objectives in the near and long terms; identify strategies and measures that can be taken to reduce climate vulnerability; communicate and build awareness of climate risks, opportunities and potential solutions; and begin implementing actions on the ground that build capacity to adapt to a changing climate.

Although the recent global upsurge in adaptation action is a welcome development, the emergence of a diverse array of efforts initiated by multiple actors within numerous jurisdictions has the potential to create confusion, lead to duplication of effort and limit the potential for sharing good practice guidance based on past efforts. Enhanced coordination among expanding networks of adaptation actors is needed to ensure resources are deployed quickly and effectively. To this end, the Adaptation Partnership was formed in 2010. Chaired by Costa Rica, Spain and the United States, the goal of the Adaptation Partnership is to encourage effective adaptation by serving as an interim platform to catalyze action and foster communication among the various institutions and actors engaged in the effort to scale up adaptation and resilience around the world.

Toward this goal, the Adaptation Partnership initiated a Review of Current and Planned Adaptation Action in the fall of 2010. Its purpose is to provide a baseline understanding of who is doing what on adaptation in three developing regions—Africa, Asia-Pacific, and Latin America and the Caribbean—and in priority adaptation sectors. Based on available resources, it seeks to provide a rapid assessment of: priority interests and adaptation needs; efforts by governments to support adaptation though policy and planning; the scope of international support for adaptation efforts in different countries and sectors; and potential gaps in adaptation efforts at the country and regional levels.

This document is one of 12 regional profiles completed as a contribution to the Review of Current and Planned Adaptation Action in Africa, Asia-Pacific and Latin America and the Caribbean. It presents a review of current and planned adaptation action in the Pacific. For the purpose of this review, the Pacific is defined as including Cook Islands, Federated States of Micronesia, Fiji, Kiribati, Marshall Islands, Nauru, Niue, Palau, Papua New Guinea, Samoa, Solomon Islands, Tonga, Tuvalu and Vanuatu. The review first provides an overview of adaptation action at a regional level, highlighting commonalities and differences between Pacific countries. The appendices that follow discuss adaptation action taking place in each of the fourteen countries in the region.

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Abbreviations and Acronyms

ADB	Asian Development Bank
AusAID	Australia Agency of International Development
CIA	Central Intelligence Agency
CIES	Cook Islands Environment Service
CROP	Council of Regional Organizations of the Pacific
CTI	Coral Triangle Initiative
DCCEE	Australia Department of Climate Change and Energy Efficiency
DFID	Department for International Development (UK)
ENSO	El Niño-Southern Oscillation
ESCAP	Economic and Social Commission for Asia and the Pacific
FAO	Food and Agriculture Organization
FINNIDA	Finnish International Development Agency
FMFNP	Fiji Ministry of Finance and National Planning
FSM	Federated States of Micronesia
GCCA	Global Climate Change Alliance
GDP	Gross Domestic Product
GEF	Global Environment Facility
IPO	Interdecadal Pacific Oscillation
IUCN	International Union for the Conservation of Nature
KMELAD	Kiribati Ministry of Environment, Land, and Agricultural Development
LDC	least developed country
LDCF	Least Developed Countries Fund
MIEPA	Marshall Islands Environment Protection Agency
NAPA	National Adaptation Programme of Action
NDIDI	Nauru Department of Islands Development and Industry
NOAA	National Oceanic and Atmospheric Administration (United States)
NMS	National Meteorological Services
NiMS	Niue Meteorological Services
PACC	Pacific Islands Adaptation to Climate Change Project
PCCR	Pacific Climate Change Roundtable
PIFACC	Pacific Islands Framework for Action on Climate Change
PIFS	Pacific Islands Forum Secretariat
PNG	Papua New Guinea
PNGMEC	Papua New Guinea Ministry of Environment and Conservation
POERC	Palau Office of Environmental Response and Coordination
SCCF	Special Climate Change Fund
SIDS	Small Island Developing States
SIMCTA	Solomon Islands Ministry of Culture, Tourism and Aviation
SMNREM	Samoa Ministry of Natural Resources, Environment and Meteorology

SOPAC	South Pacific Applied Geoscience Commission
SPA	Strategic Priority for Adaptation (Global Environment Facility)
SPC	Secretariat of the Regional Pacific Community
SPCZ	South Pacific Convergence Zone
SPREP	Secretariat to Pacific Regional Environmental Program
TDE	Tonga Department of Environment
UNDP	United Nations Development Programme
UNESA	United Nations Economic and Social Affairs
UNFCCC	United Nations Framework Convention on Climate Change
UN-HABITAT	United Nations Human Settlements Programme
VMIPU	Vanuatu Ministry of Infrastructure and Public Utilities
WHO	World Health Organisation
WWF	World Wildlife Fund / World Wide Fund for Nature

Executive Summary

Growing understanding of the need to adapt to the impacts of climate change has led to a significant rise in ongoing and planned adaptation action in the developing regions of the world, including the Pacific. This upsurge in climate change adaptation action is a welcome occurrence, but enhanced coordination among expanding networks of adaptation actors is needed to ensure resources are deployed quickly and effectively. Responding to this concern, a review of current and planned adaptation action in the Pacific was undertaken by the Adaptation Partnership[1] between October 2010 and April 2011. This review covered the countries of the Cook Islands, Federated States of Micronesia, Fiji, Kiribati, Marshall Islands, Nauru, Niue, Palau, Papua New Guinea, Samoa, Solomon Islands, Tonga, Tuvalu and Vanuatu. The review identified: priority adaptation needs; efforts by governments to support adaptation though policy and planning; the scope of international support for adaptation efforts in different countries and sectors; and potential gaps in adaptation efforts at the country and regional level. This review of adaptation action in the Pacific is one of 12 profiles covering regions of Africa, Asia-Pacific, and Latin America and the Caribbean completed by the Adaptation Partnership.

To assess the level of adaptation action in the Pacific, a desk-based review of internet sources and relevant documentation was undertaken. The content of these sources was assessed in relation to a set of parameters established to focus the review's scope and ensure consistency across regions. Notably, it examines *discrete* adaptation actions, or "policies, programs and projects designed and implemented specifically to address the current and projected impacts of climate change." The review therefore presents only a portion of the breadth of efforts underway to reduce the vulnerability of developing countries to the impacts of climate. In particular, it does not capture the array of development activities that are increasing the adaptive capacity of communities and countries. As well, within the review, adaptation actions have been deemed to be "current" if they were ongoing or completed in 2009 or later. As such, the review does not include a historical review of all discrete adaptation projects that may have contributed to building local and national adaptive capacity. The review also does not offer judgment of the effectiveness of actions taking place; it only identifies which actions are underway. In addition, reflecting the desk-based nature of the review, it is acknowledged that the content is biased toward identification of large-scale projects funded by international development assistance organizations. As such, small-scale projects that meet the review's definition of adaptation action, particularly those occurring at the community level, are not fully represented within the review.

[1] Formed in 2010, the Adaptation Partnership is chaired by Costa Rica, Spain and the United States. Its goal is to encourage effective adaptation by serving as an interim platform to catalyze action and foster communication among the various institutions and actors engaged in the effort to scale up adaptation and resilience around the world.

Climate vulnerability

The climate of the Pacific Island region is influenced by a variety of factors, including trade wind regimes and movement of the South Pacific Convergence Zone (SPCZ), as well as the El Niño-Southern Oscillation (ENSO) and the Interdecadal Pacific Oscillation (Mimura et al., 2007). Due to these natural processes, the region is prone to considerable climate variability and weather-related disasters—including tropical cyclones, floods, coral bleaching and storm surges (World Bank, 2009). Within the context of this natural variability, observed, averaged South Pacific Ocean surface and island air temperatures (southwest of the SPCZ) have risen by between 0.6° and 1.0°C since 1910. Other observed changes in the Pacific region include increases in: the number of Category 4 and 5 storms in the southwest Pacific; tropical cyclone activity (east of 160°E), particularly in association with El Niño events; and a rise in Pacific basin sea levels at a rate of 0.77 millimeters per year (Mimura et al., 2007, and citations therein).

Projections of future changes in Pacific climatic conditions are uncertain due to the limited availability of historical data, weaknesses in existing modeling capabilities and an incomplete understanding of current climate focuses, such as ENSO. Within these limitations, studies anticipate that the Pacific region will experience warming of approximately 0.8° to 1.8°C by mid-century, reaching 1° to 3.1°C by the end of the century. Precipitation projections for the region are less certain; as too are projections regarding changes the characteristics of tropical cyclones and ENSO patterns. Sea level rise, projected to be 0.19 to 0.58 meters over the course of this century (2080 to 2099; Meehl et al., 2007), is of particular concern to the low-lying coral atoll countries of Kiribati, the Marshall Islands and Tuvalu (Barnett, 2001).

These projected and potential changes in the Pacific climate have raised concerns regarding potential impacts on the region's coastal and marine resources, water resources, agricultural resources, human health, and forests. The possible impacts of projected and potential climatic changes on these sectors include:

- *Coastal and marine resources:* higher sea temperatures, rising sea levels and the potential for stronger storms could lead to the bleaching of corals, loss of wetlands, flooding of low-lying regions, erosion of coastlines, endangerment of mangroves, changes in fish circulation patterns, and damage to infrastructure—nearly all of which is located in coastal locations (FAO, 2008; Mimura et al., 2007; PNGMEC, 2000; SIMCTA, 2004; SMNREM, 2005).
- *Water resources:* higher temperatures, changes in precipitation patterns, salt water intrusion and existing challenges such as deforestation could compromise the availability and quality of water resources—an issue of particular importance for those Pacific Island states that have existing water scarcity concerns due to their size, geology and topography (Mimura et al., 2007; SMNREM, 2005; SIMCTA, 2004).
- *Agricultural resources:* approximately 70 per cent of the crops grown in the Pacific are dependent upon seasonal summer rains (FAO, 2008). Changes in the patterns of these rains, along with soil salinization, altered pest and disease patterns, and potentially higher risk of

extreme weather events could reduce agricultural output and, by extension, negatively impact national economies.

- *Human health:* rising temperatures, more variable rainfall, and potentially more intense extreme weather events could result in greater incidence of vector- and water-borne diseases such as malaria, dengue fever and diarrhea (Mimura et al., 2007). Health may also be impacted by compromised food security, severe storms, drought and declines in water quality and quantity (PNGMEC, 2000).
- *Forestry, biodiversity and nature:* climate change could augment existing concerns related to deforestation and loss of biodiversity by leading to accelerated beach erosion, degradation and bleaching of coral reefs (Mimura et al., 2007) and changes in the growing conditions suitable for established ecosystems.

Identified adaptation needs and priorities

In light of these projected climatic changes and understood vulnerabilities, Pacific Island countries have identified a number of adaptation actors to reduce the vulnerability of particular sectors to the impacts of climate change. These adaptation actions include (CIES, 1999; FMFNP, 2005; KMELAD, 2007; MIEPA, 2000; PNGMEC, 2000; SIMCTA, 2004; SMNREM, 2005; TDE, 2005; VMIPU, 2007):

- *Coastal and marine resources:* land-use policies that encourage settlement away from low-lying areas; mangrove and reef protection measures; improved public awareness; establishment of early-warning systems; and marine breeding and restocking programs.
- *Water resources:* improved water catchment management; soil conservation measures; rainwater collection and desalinization; and water conservation programs, including demand management and leakage control.
- *Agricultural resources:* research into flexible farming options, salt-resistant crops and heat-tolerant species; cessation of crop production on marginal and sloping lands; agroforestry techniques; pest and disease management; and crop diversification.
- *Human health:* prevention and preparedness for epidemics; improved water safety and sanitation; malaria awareness programs; and improved medical services.
- *Forestry, biodiversity and nature:* enhanced research into the possible impacts of climate change on flora and fauna as well as ecosystem rejuvenation; reforestation and conservation programs; promotion of agroforestry; changes in land use policies; and generation of public awareness.

Policy level actions

Pacific Island countries are engaged in a number of regional level policy coordination initiatives concerning climate change adaptation. Most prominently, these include: identification of climate change adaptation as one of five theme's in the *Pacific Plan for Strengthening Regional Cooperation and Integration* for the period of 2010 to 2012; the *Pacific Islands Framework for Action on Climate Change*, which cover the period of 2006 to 2015; and the Pacific Climate Change Roundtable. Collaboration

between countries is supported by regional bodies such as the Secretariat of the Pacific Community, the Pacific Islands Forum, the Council of Regional Organizations for the Pacific, and the Secretariat to the Pacific Regional Environmental Program.

At the national level, Pacific Island countries have highlighted their climate change adaptation concerns and needs since 1999 through their National Communications to the United Nations Framework Convention on Climate Change and, by the least developed countries (Kiribati, Samoa, Solomon Islands, Tuvalu and Vanuatu), National Adaptation Programmes of Action (NAPAs). The degree to which Pacific Island countries are presently developing discrete adaptation policies or strategies, and integrating adaptation into existing plans and sectoral strategies, varies from country to country. Some countries—such as the Federated States of Micronesia, Fiji, the Marshall Islands, Tuvalu and Vanuatu—have either developed, or are in the process of developing, national climate change/adaptation policies. Others have integrated adaptation into their national development plans (e.g., the Cook Islands' National Sustainable Development Strategy (2006–2010) and Tuvalu's National Strategy for Sustainable Development (2005–2015)) and sectoral strategies (such as Kiribati's National Water Resource Policy and Tonga's National Forest Policy).

Projects and programs that support adaptation

Pacific Island countries are engaged in a number of projects and programs that bring them together to jointly address shared concerns and needs. This level of regional cooperation reflects the area's shared vulnerabilities, needs and priorities; the relatively small size and limited human, technical and financial resources of many national governments; and traditional donor flows through regional programs. The sectors most commonly being addressed through these projects are water resources, coastal zone management, agriculture, and policy and planning. Although the majority of projects are focused on capacity building, policy and planning, and research, several projects also finance the implementation of pilot adaptation measures.

While Pacific Island states are participating in a number of projects that also engage countries from Asia, Africa and Latin America and the Caribbean, only a few are implementing standalone projects tailored to meeting their individual, national adaptation needs. Many of these country-specific projects respond to needs identified in the NAPAs prepared by the region's least developed countries.

Funders of regional and national project in the region include the Governments of Australia, Canada, Germany, Japan, New Zealand and the United States, along with the Asian Development Bank, Global Environment Facility, Global Facility for Disaster Reduction and Recovery, Least Developed Countries Fund, Special Climate Change Fund, World Bank and World Health Organization.

Adaptation communities of practice

Countries in the Pacific region are participating in two large networks that bring together policy makers and researchers to build knowledge related to climate change adaptation: the Asia–Pacific Adaptation Network and the Adaptation Research Policy Network for Asia and the Pacific. Other formal communities of practice have not been identified through this review.

Needs and Gaps

Through regional intergovernmental organizations, dedicated regional projects, and national initiatives in the areas of policy and programming, Pacific Island countries are working to increase their capacity to adapt to the impacts of climate change. These actions appear to be focused on a wide range of identified priorities, with a slightly higher level of activity in the areas of water, agriculture, coastal zones and disaster risk reduction. Future adaptation action in these areas will be required to further enhance adaptive capacity in the region. Greater attention may also need to be given to priority areas that appear to be under-represented within current initiatives:

- *Human health*—a priority concern for many countries due to the potential for climate change to increase exposure to malaria, dengue fever, diarrhea and other illnesses;
- *Infrastructure*—reflecting the exposure of much of the region's roads, buildings and communities to coastal erosion and sea level rise;
- *Marine resources*—given the current and growing importance of fisheries and tourism to the region's economy; and
- *Gender considerations*—based on existing socioeconomic gender inequalities (such as accessibility to resources and decision-making powers) and how climate change may exacerbate these inequalities.

In addition, a larger number of adaptation projects tailored to specifically meeting the needs of individual countries may be appropriate, particularly within some of the region's larger countries, such as Fiji, PNG, the Solomon Islands and Vanuatu. Furthermore, existing action remains dominated by capacity building, research and policy development initiatives, reflective of the generally low level of capacity in the Pacific region. Although these types of projects continue to be important, an increase in "on the ground" adaptation action may be appropriate where knowledge and capacity is sufficiently established.

Overall, through the region's large number of joint initiatives, Pacific Islanders are being provided with an opportunity to better coordinate efforts, maximize potential synergies, and learn from one another regarding best adaptation practices in vulnerable sectors. Continued effort will be needed to build upon the research, knowledge and capacity gained in previous years to ensure that the Pacific region is able to achieve its sustainable development objectives in a changing climate.

Review of Existing and Planned Adaptation Action: The Pacific

1.0 Introduction

The Pacific region refers to 14 Small Island Developing States (SIDS) scattered across the Pacific Ocean below the Tropic of Cancer—the Cook Islands, Federated States of Micronesia (FSM), Fiji, Kiribati, Marshall Islands, Nauru, Niue, Palau, Papua New Guinea, Samoa, Solomon Islands, Tonga, Tuvalu and Vanuatu (see Figure 1). Within this group, five are associated states of either New Zealand (Cook Islands and Niue) or the United States (FSM, Marshall Islands and Palau). All of these countries and territories are listed as Non-Annex I Parties to the United Nations Framework Convention on Climate Change (UNFCCC), and five are designated as among the least developed countries (LDCs) in the world: Kiribati, Samoa, the Solomon Islands, Tuvalu and Vanuatu. The region is often divided into the three, largely ethnographically defined, sub-regions: Melanesia[2] (western Pacific), Polynesia[3] (southeast Pacific), and Micronesia[4] (northern Pacific).

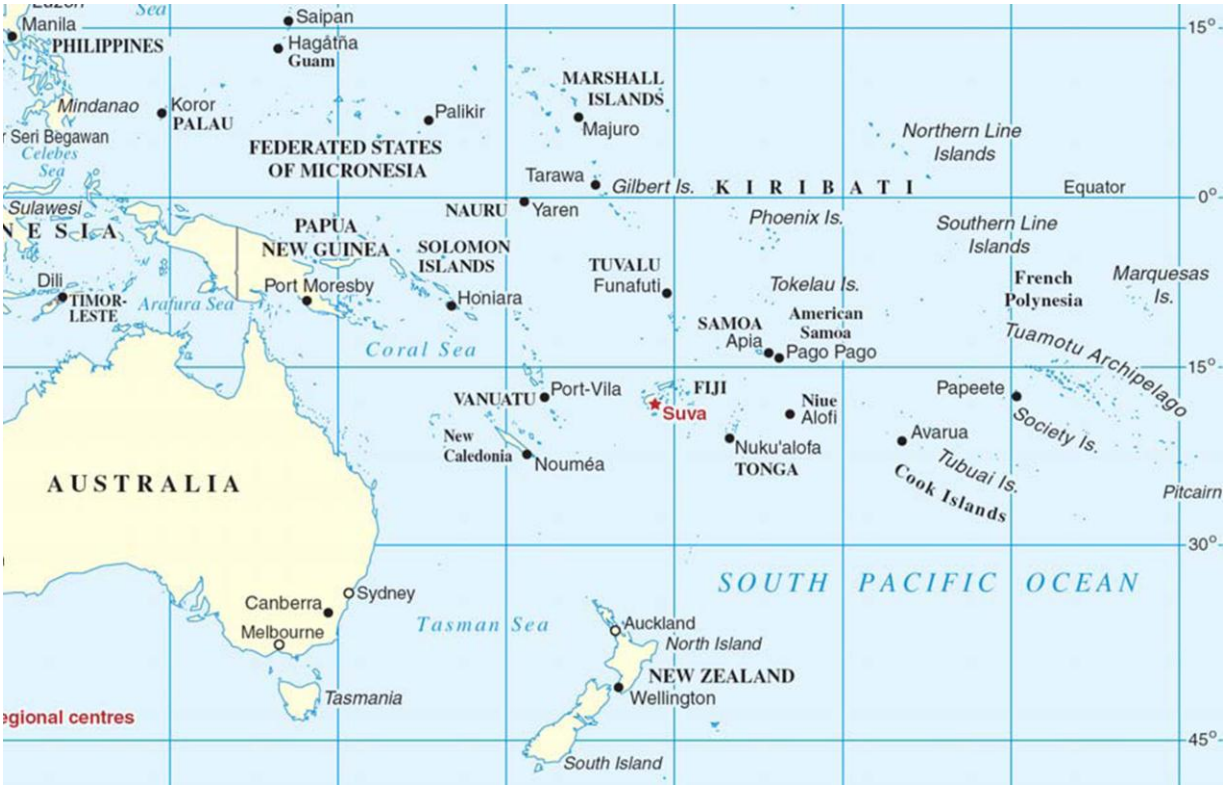
Diversity characterizes the region. Some states are single-island nations (e.g., Niue), while others are comprised of hundreds of widely dispersed groups of coral atolls (e.g., FSM). In terms of physical geography, the islands are generally divided into two groups: high volcanic islands and low-lying coral atolls. The former vary in size but usually have more fertile soil and freshwater resources, while the latter are small, only a few meters above sea level, with poor soils and limited surface and ground water resources. The islands in Melanesia tend to be large, mountainous and volcanic, while most of the states in Polynesia and Micronesia are composed of small, low islands.

The region's estimated 9.96 million inhabitants (in 2010; UNESA, 2011) rely mostly on tourism, fisheries, forestry and agriculture. The combined value of the Gross Domestic Product (GDP) of Pacific SIDS is about US$15 billion (ESCAP, 2010). Papua New Guinea dominates the region statistically, with an estimated 74 per cent of the region's total population (approximately 6.858 million people in 2010; UNESA, 2011) and over half (US$8.2 billion) of its GDP (ESCAP, 2010). The region has experienced a low average growth in economic output over the last ten years and increasing trade deficits. Remittances, which are a major source of income and a safety net for the poor (particularly in Fiji, Samoa and Tonga), have grown substantially during the last decade. The

[2] Melanesia includes the islands immediately north and northeast of Australia, including Fiji, Papua New Guinea, Solomon Islands and Vanuatu.

[3] The Polynesia sub-region extends in the general shape of a triangle from New Zealand to Hawaii to Easter Island, and includes the Cook Islands, Niue, Samoa, Tonga and Tuvalu.

[4] Micronesia, lying to the east of the Philippines and north of Melanesia, is composed of thousands of small islands and includes the countries of Kiribati, Marshall Islands, Federated States of Micronesia, Nauru and Palau.



Source: Taken from Map No. 3974 Rev. 15 (Economic and Social Commission for Asia and the Pacific), United Nations, July 2007.

global recession has, however, led to declines in these transfers; it has also compounded economic challenges for the region by lowering prices and reducing demand for commodity exports, slowing the growth in tourism, reducing the value of offshore national trust funds, and decreasing foreign direct investment (AusAID, 2009). While there are some indicators of economic recovery (ADB, 2010a), there is an overall recognition that poverty in the region is growing and most countries are unlikely to meet their Millennium Development Goal targets (ADB, 2010b; AusAID, 2009).

To better understand efforts underway in the Pacific to prepare for and respond to the impacts of climate change, this report provides a rapid review of current and planned adaptation action within the region. Based on available resources, it examines: identified priority adaptation needs; efforts by governments to support adaptation though policy and planning; the scope of international support for adaptation efforts in different countries and sectors; and potential gaps in adaptation efforts at the country and regional level. The main body of the report provides an overview of adaptation action at the regional level, highlighting commonalities and differences between the Cook Islands, Federated States of Micronesia, Fiji, Kiribati, Marshall Islands, Nauru, Niue, Palau, Papua New Guinea, Samoa, Solomon Islands, Tonga, Tuvalu and Vanuatu. In the appendices that follow, adaptation action taking place in each of these countries is discussed.

2.0 Methodology

A rapid review of current and planned adaptation action in the Pacific—one that gives attention to policies, programs and projects at the national and regional level—presents a considerable task given the breadth of actions that can and are being taken to reduce vulnerability to the short, medium and long-term impacts of climate change. Prior to undertaking this review, it therefore was necessary to clarify the terms that would be used within it and establish a set of parameters to limit its scope. This section provides an understanding of the research parameters established for this rapid review and the process by which the information it contains was gathered. These guidelines are presented to help clarify what the study does and does not aim to achieve.

Definition of "Adaptation Action"

Adaptation is generally defined as being an "adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities."[5] Given the breadth of actions that may be taken which are in keeping with this definition, a critical first step in initiating the rapid review was determining the definition of "adaptation action" to be used within it.

This process was influenced by the outcomes of a review of 135 "adaptation" activities undertaken by McGray et al (2007) that led to identification of three different models of adaptation activity:

- *Serendipitous adaptation*—"activities undertaken to achieve development objectives [that] have outcomes that incidentally may also support adaptation" (McGray et al, 2007, p. 13). This type of adaptation reflects the widely acknowledged intimate linkage between sustainable development and building capacity to adapt to the impacts of climate change. Specifically, sustainable development can enhance adaptive capacity by strengthening institutions, promoting sound management of natural resources, improving health and education systems, promoting gender equity and fostering economic growth.
- *Climate-proofing of development efforts*—where activities are "added to an ongoing development initiative to ensure its success under a changing climate. In these cases, adaptation is seen as a means to a development end" (McGray et al, 2007, p. 13); and
- *Discrete adaptation*—where "adaptation to climate change is the primary objective of a project or initiative. From the beginning, implementers and funders of these efforts have climate change in mind" (McGray et al, 2007, p. 13).

While recognizing the critical role of serendipitous adaptation and climate-proofing of development efforts in fostering adaptation to climate change in developing countries, a review of all three types of adaptation activities would be unmanageable. This study therefore focuses on an examination of discrete adaptation activities. Therefore, adaptation action within the review is defined as *policies,*

[5] UNFCCC glossary of climate change acronyms: http://unfccc.int/essential_background/glossary/items/3666.php.

programs and projects designed and implemented specifically to address the current and projected impacts of climate change. As such, specific reference has been made to supporting adaptation to climate change, and/or climate risk reduction in the objectives and/or rationale of each policy, program or project included in the study.

Due to the selection of this definition, the review automatically presents a narrow snapshot of the wide breadth of activity (often funded though official development assistance[6]) that is helping developing countries build adaptive capacity and reduce their vulnerability to the impacts of climate change. Therefore, the review should not be viewed as fully representative of the entirety of adaptation action occurring in developing countries—nor of the degree to which vulnerability reduction is occurring in the countries and regions profiled. Rather, the review aims to contribute to understanding of the identified adaptation needs and priorities of different countries and regions and the degree to which discrete adaptation activities are contributing to meeting these needs.

Definition of "Current" Action

To further focus the study, adaptation action have been deemed to be "current" if they were ongoing or completed in 2009 or later. As such, the review does not include a range of projects completed prior to 2009 that may have significantly contributed to building local and national adaptive capacity. This observation is particularly true of adaptation action in the Caribbean and Pacific; reflecting the early interest and commitment of small island developing states (SIDS) to understanding and reducing their vulnerability to the impacts of climate change, countries in these regions began to explore adaptation concerns as early as the late 1990s.

While the review's definition of "current" adaptation action limits the scope of the study, the volume of discrete adaptation initiatives has accelerated in recent years, as reflected in the following trends:

- Financing for approved projects through the Least Developed Countries Fund has risen from nearly US$24 million in 2008 to US$177 million as of mid-2011;[7]
- Adaptation financing through the Special Climate Change Fund has increased from 22 projects worth nearly US$90.73 million in 2009 (GEF, 2009) to 31 projects approved for financing in the amount of US$128 million as of mid-2011;[8] and
- Financing for adaptation by four Bilateral Financial Institutes increased by 31 per cent from US$3,029 million in 2008 to US$3,963 million in 2009 (SEI and UNEP, 2010).

Therefore, the review reflects the growing number of adaptation efforts initiated in recent years.

[6] In 2010, official development assistance totaled US$128.7 billion (OECD, 2011)—a level of funding that significantly outstrips that which is currently provided in support of adaptation to climate change. See, for example, SEI and UNEP (2010).
[7] GEF, Least Developed Countries Fund website: http://www.thegef.org/gef/ldcf (accessed September, 2011).
[8] GEF, Special Climate Change Fund website: http://www.thegef.org/gef/sccf (accessed September, 2011).

Identification of Projects and Programs

A wide range of climate adaptation related initiatives are underway throughout the world—covering the gamut from original scientific research that informs our understanding of current and future climate patterns, to capacity building and knowledge sharing, to the adoption of new planting practices by farmers, to the building of infrastructure that anticipates future climatic extremes. While acknowledging this diversity, to better achieve the specific objectives of the review, it has focused on time-bounded projects that support preparation for and/or implementation of practical adaptation action. As such, the review does not include projects and programs that focus on:

- conducting original scientific research that enhances knowledge of climate change impacts and development of the tools and techniques for reducing vulnerability;
- ongoing, long-term monitoring efforts (whether climatic or socio-economic) that are needed to inform decision-making;
- stand-alone capacity building and knowledge sharing workshops, conferences and training programs; and
- activities solely related to participation in the ongoing international climate change negotiations.

As well, the review only captures adaptation action financed through international development assistance; it does not capture adaptation efforts financed solely by national governments. This focus reflects the original impetus for conducting the review—the current scaling up of adaptation action and the potential for duplication of effort and limited sharing of good practice—and the challenge of rapidly identifying nationally funded adaptation projects. This parameter is particularly important for countries such as Brazil and China, whose governments are engaged in self-driven and self-funded adaptation efforts that are not included within this review.

Data collection

Projects and programs were primarily identified through a desk-based review of the websites of UN agencies, bilateral development agencies, multilateral financial institutions, international research organizations and non-governmental organizations. Reflecting the desire for a rapid review, a comprehensive examination of all of these organizations was not undertaken; rather an emphasis was placed on capturing initiatives involving organizations generally recognized as being actively engaged in fostering climate change adaptation. Additional information regarding current and planned adaptation action was gathered through an examination of relevant reports.

The process by which data were gathered for inclusion in the review has biased its content. Notably, it is highly likely that a number of small-scale projects meeting the review's definition of adaptation action, particularly those occurring at the community level, have not been captured. As well, the accuracy of the data captured in the review significantly depends upon the accuracy and completeness of the internet resources used.

Classification of projects

To support analysis of the degree to which ongoing projects are addressing the priority adaptation needs of developing countries, identified initiatives have been classified in relation to two general characterizations—their sector or areas of focus and the types of activities being implemented. For the sectors or areas in which projects are supporting adaptation action, a classification system comprised of the following 14 macro project categories was developed: food, fiber and forests; ecosystems; freshwater resources; oceans and coastal areas; disaster risk management; migration and security; gender; business; infrastructure; human settlements; human health; climate information services; governance; and multi-sectoral. These macro project categories were then divided further to provide a more detailed picture of the types of projects identified through the review. For example, the macro project category of "food, fiber and forests" was sub-divided into agriculture, pastoralism, forestry and fire management. Current adaptation projects were then labeled in relation to one or more of these sub-categories.

For the types of projects being implemented, a shorter list of categories was developed. Current adaptation projects have been assessed in relation to the degree they support research, assessment, capacity building, knowledge communication, policy formation and integration, field implementation and community-based adaptation. A fuller discussion of the project classification system used during this review is provided at the beginning of the appendices.

Gender analysis

Within the review, assessments of the degree to which gender-sensitive adaptation action are underway in different countries and regions has focused solely upon the extent to which addressing gender inequalities is a specified objective of projects and programs. The review did not assess the degree to which individual projects and programs may or may not have integrated gender issues into their detailed design.[9] Therefore, the gender analysis provided in the review should not be viewed as fully representative of the degree to which current adaptation action is gender-sensitive.

Assessment of the effectiveness of adaptation action

It should also be noted that this rapid review does not assess the quality or effectiveness of the project and programs it includes. Therefore, the review does not provide a basis upon which to judge the degree to which completed and ongoing projects have either achieved their stated objectives and/or made a positive contribution to increasing the ability of a country or region to adapt to the impacts of climate change. It only provides an indication of the intended outcomes of the identified initiatives, the type of action being taken (e.g., capacity building, policy integration and implementation of practical actions) and their area of focus (e.g., agriculture, water and health).

[9] For example, a project may have as its objective building resilience in the agriculture sector and target farmers in general. As no reference to gender is made in the project's objectives, it would not be considered a gender-focused adaptation action within the review. This finding would stand even if the detailed design of the project includes having set targets to ensure the involvement of female farmers.

Scientific Information

Synopsis of projected changes in climate in different countries and regions included in the review are based primarily on the content of the Fourth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC) and national assessment reports (e.g., National Communications). New scientific analysis published since the completion of these reports may have both refined and presented revised understandings of the projected consequences of climate change in different regions of the world. Therefore, the climate projection sections of the review should be viewed as indicative of anticipated trends in climatic change at the time of publication of the cited reports.

Qualification of Degree of Adaptation Action

To evaluate and consistently describe the relative level of adaptation activity occurring by country in each region, a simple benchmarking process has been applied across the review. Using a scale from zero to "X", where "X" is equivalent to the number of current adaptation projects underway in the country in a particular region with the largest number of current projects,[10] the scale was divided into five equivalent quintiles. Each quintile was then assigned a descriptor as follows:

- "Very Low" level of adaptation action = 0 to 20 per cent of "X;"
- "Low" level of adaptation action = 21 to 40 per cent of "X;"
- "Moderate" level of adaptation action = 41 to 60 per cent of "X;"
- "High" level of adaptation action = 61 to 80 per cent of "X;" and
- "Very High" level of adaptation action = 81 to 100 per cent of "X".

All countries in the region were allocated to one of these quintiles based on the total number of current adaptation projects and programs identified through the review.

This benchmark approach enabled a standard methodology to be applied across all 12 regions examined in the Review of Current and Planned Adaptation Action while also recognizing their individual differences. (For example, the smaller geographies and populations of SIDS suggest that hosting, for instance, 15 projects might reflect a higher level of activity than what might be possible for larger and more populated countries.) However, this methodology does not assess the financial size of individual projects; small projects are given equal weight in comparison to large projects. This approach also does not account for a country's comparative geographic size, population, level of development and other factors that may affect its level of adaptation activity. Therefore, these contextual influences are discussed within individual country profiles and regional comparisons.

[10] In other words, the country in the region with the highest total number of current adaptation projects was identified and used as a benchmark against which to assess performance in all other countries.

Countries and Regions Incorporated in the Review

The following criteria were considered to identify countries to be included in the Review of Current and Planned Adaptation Action in Africa, Asia-Pacific and Latin America and the Caribbean, and determine their regional allocations:

- Inclusion only of non-Annex I Parties to UNFCCC;
- Allocation by region in accordance with the classification system used by the United Nations Statistics Division (UNSD, 2010); and
- The Organisation for Economic Co-operation and Development (OECD) Development Assistance Committee's list of countries eligible to receive official development assistance in 2009 and 2010 (OECD, 2009).

Definition of "Communities of Practice"

Communities of practice traditionally have been defined as "groups of people who share a concern or a passion for something they do and learn how to do it better as they interact regularly" (Wenger, 2006). These groups are usually defined by a shared domain of interest and relationships than enable mutual learning. Broadly speaking, two different types of communities of practice with an interest in adaptation to climate change may be identified as:

- Established communities of practice, usually defined by a sector or issue, which have begun to integrate consideration of adaptation needs and priorities into their existing knowledge sharing efforts (e.g., a community of foresters discussing methods of integrating projected climate risk into their management planning); and
- New communities of practice established specifically due to a shared interest in adaptation to climate change (e.g., community-based adaptation experts).

Of these two broad groupings, the review gives attention only to communities of practice, which originated due to their shared interest in adaptation to climate change. This includes networks of non-governmental organizations actively engaged in sharing information regarding climate change. This focus reflects the greater challenge of identifying and assessing the degree to which the vast array of traditional associations and networks have begun to integrate adaptation concerns into their discussions.

Anticipated Reader

Finally, it should be noted that the review has been written in a manner that assumes that its readers will have a basic understanding of adaptation to climate change. As such it does not provide definitions of terms such as "National Communication" or "National Adaptation Programmes of Action." Nor are explanations of key concepts included, such as "adaptive capacity," "mainstreaming," the relationship between climate change and development, or the challenges associated with the implementation of adaptation actions at the policy and program levels.

3.0 Climate Projections

The climate of the Pacific Island region is influenced by a variety of factors, including trade wind regimes, movement of the South Pacific Convergence Zone (SPCZ), and the paired Hadley cells and Walker circulation. The dominant factor influencing the region's year-to-year climate is the El Niño-Southern Oscillation (ENSO), while the Interdecadal Pacific Oscillation (IPO) is the leading mode of variability on a decadal time-scale (Mimura et al., 2007, and citations therein). Due to these natural processes, the region is prone to considerable climate variability. It also experiences a number of weather-related disasters—including tropical cyclones, floods, coral bleaching and storm surges (World Bank, 2009). Historically, events such as these have had a discernible impact on Pacific economies; between 1950 and 2004 cyclones accounted for 76 per cent of reported disasters, with an average costs per cyclone of around US$75.8 million (2004 value) (UNFCCC, 2007). In the 1990s alone, the cost of extreme weather events in the Pacific is estimated to have exceeded US$1 billion (FAO, 2008).

Changes in historical climate trends have been observed in the Pacific region due to natural oscillations of the IPO and ENSO patterns and, more recently, anthropogenic forcing due to great concentrations of atmospheric greenhouse gases. In most of the Pacific basin, sea surface temperatures warmed from the early 1900s and 1940s, then were cooler northeast of the SPCZ after the 1940s, and warmed again in the 1970s (Mimura et al., 2007, and citations therein). Within this variability, the observed, averaged annual and seasonal warming trend in South Pacific Ocean surface and island air temperatures (southwest of the SPCZ) has been from 0.6° to 1.0°C since 1910. On a decadal basis, a warming trend in the range of 0.3° to 0.5°C has been observed since the 1970s (Mimura et al., 2007, and citations therein); this increase in sea surface temperatures has been due to a combination of the natural oscillation of the IPO from a negative to a positive pattern and anthropogenic forcing due to greenhouse gas emissions (Meehl et al., 2009).[11] A greater relative frequency or persistence in El Niño events compared to La Niña events has also been observed since the 1970s (Lal et al., 2002). Whether or how ENSO patterns will change in the future is uncertain.

Changes in historical precipitation patterns during the 1900s are difficult to discern due to high inter-annual variability. However, other observed changes in the Pacific region include an increase in the number of Category 4 and 5 storms in the southwest Pacific and in tropical cyclone activity (east of 160°E), particularly in association with El Niño events. As well, Pacific basin sea levels have been increasing by 0.77 millimeters per year (Mimura et al., 2007, and citations therein).

[11] In their study, Meehl et al. (2009) found that sea surface temperatures in the Pacific would have begun to warm due to anthropogenic global warming in the 1960s in the absence of the large, inherent climate fluctuations that moved the IPO into a negative pattern.

Projections of how the climatic conditions in the Pacific will change are uncertain due to the limited availability of historical data, difficulties with reproducing historical climate trends using existing models, and lack of full understanding of current climate forces, such as ENSO and IPO. Within these limitations, studies anticipate that the Pacific region will experience warming of approximately 0.8° to 1.8°C by mid-century, reaching 1° to 3.1°C by the end of the century, as presented in Table 1 (Mimura et al., 2007).[12] Similar results were generated in a study by Lal et al. (2002).[13] However, because of challenges associated with the grid size used by Global Circulation Models relative to the size of many Pacific Islands, these projections generally apply to open ocean surface temperatures rather than small island land surface temperatures; as a result, land-based temperature changes may in fact be higher than these projections for the Pacific region. Although the frequency of extreme temperatures is likely to increase, current projections do not anticipate significant changes in the range of daytime and night time temperatures, and seasonal temperature variations are likely to be minimal (Mimura et al., 2007).

Table 1: Projected effects of climate change on temperature and precipitation in the Southern Pacific region.

Period	Projected increase in temperature (°C) relative to 1961-1990	Projected change in precipitation (%) relative to 1961-1990
2010 to 2039	0.45 to 0.82	-3.9 to + 3.4
2040 to 2069	0.80 to 1.79	-8.23 to +6.7
2070 to 2099	0.99 to 3.11	-14.0 to +14.6

Source: Derived from Mimura et al. (2007)

Precipitation projections for the region are less certain, with models predicting both moderate increases and decreases in annual rainfall for most of the southern Pacific, as identified in Table 1. Certain studies anticipate more rainfall during the summer period, along with a likely increase in daily rainfall intensity (Lal, 2004). The effect of a warming climate on the frequency and intensity of tropical cyclones in the Pacific is uncertain. At a global level, averaged projections suggest that cyclones are likely to become more intense but their frequency may decline (Knutson et al., 2010).[14] In general, studies suggest that current climate regimes and the changes resulting from ENSO events

[12] Projected temperature and precipitation levels based upon a study completed by Ruosteenoja et al. (2003) that used seven coupled atmosphere-ocean general circulation models and the A1F1 (high), A2 (medium-high), B1 (low) and B2 (medium-low) emission scenarios of Special Report on Emission Scenarios of the Intergovernmental Panel on Climate Change (IPCC). These findings are consistent with previous findings of the IPCC (Mimura et al., 2007).

[13] Lal et al. (2002) projected that temperatures would increase by 0.93°C (+/- 0.12°C) by the 2020s; 1.98°C (+/- 0.41°C) by the 2050s; and 2.99°C (+/- 0.87°C) by the 2080s. Surface warming was generally found to be uniform throughout the year. They also noted that temperature increases in the Pacific region were found to be less than projections for small islands states in other regions of the world. These results were based on the use of five atmosphere-ocean global climate models under the IS92a emission scenario (Lal et al., 2002: 186).

[14] Projections of tropical cyclones are challenging due to limited historical data and because their significant fluctuations in frequency and intensity make it difficult to detect long-term trends. As such, projections of changes in particular basins such as the Pacific are currently uncertain (Knutson et al., 2010). At a global level, however, "future projections based on theory and high-resolution dynamical models consistently indicate that greenhouse warming will cause the globally averaged intensity of tropical cyclones to shift towards stronger storms, with intensity increases of 2–11% by 2100. Existing modelling studies also consistently project decreases in the globally averaged frequency of tropical cyclones, by 6–34%. Balanced against this, higher resolution modelling studies typically project substantial increases in the frequency of the most intense cyclones, and increases of the order of 20% in the precipitation rate within 100 km of the storm centre" (Knutson et al., 2010: 157).

could be accentuated in a warmer world (Mimura et al., 2007); it is the imposition of extreme events upon these changes in average conditions that is of most concern to small island states, including those in the Pacific (Lal et al., 2002).

Given the low-lying nature of many Pacific Islands, sea level rise is a serious shared concern. Globally, sea levels are projected rise by 0.19 to 0.58 meters[15] over the course of this century (2080 to 2099; Meehl et al., 2007). The degree of change in the Pacific will depend in part on non-climatic factors such as island tectonic settings (Mimura et al., 2007). Should sea level rise reach half a meter or more—a scenario that likely would not occur until the 2070 to 2090 period (Preston et al., 2006)—the land area of the low-lying coral atoll countries of Kiribati, the Marshall Islands and Tuvalu could be reduced considerably (Barnett, 2001).

4.0 Needs and Priorities within the Pacific Region

The vulnerability of Pacific Island countries to the effects of climate change is exacerbated by their unique geographic and economic characteristics, including a small but rapidly expanding population, significant rural to urban migration, limited size, remoteness, proneness to natural disasters, narrow economies based primarily on primary production, dependence on international trade, and limited ecological carrying capacity (Barnett, 2001; Mimura et al., 2007). Recognizing their vulnerability, Pacific Island countries have identified their adaptation needs and priorities through National Communications to the UNFCCC, National Adaptation Programmes of Action (NAPAs), and other documents. The priority areas of concern for these countries are summarized in Table 2. The most commonly shared priorities including the following areas: coastal zones; water; agriculture; health; marine resources and fisheries; and forestry.

Coastal zones and fisheries

Given the high ratio of shoreline to land area found in Pacific Islands (Barnett, 2001), it is perhaps not surprising that these countries have identified coastal zones and fisheries as being priority areas for adaptation. Climate change is anticipated to adversely affect the coastal zones of Pacific Island countries through sea level rise, bleaching of corals, loss of wetlands, flooding and erosion, and endangerment of mangroves (PNGMEC, 2000; SIMCTA, 2004; SMNREM, 2005). Sea level rise, along with larger storm surges, also presents a danger to Pacific Island infrastructure (such as international airports and roads), nearly all of which are located in coastal locations. So too are the

[15] Projection based upon use of six IPCC emissions scenarios and in comparison to a base period of 1980 to 1999. The IPCC emission scenarios present a range of sea level rise predictions, based on various emissions scenarios and resulting from thermal expansion of the oceans and land ice changes. On one end of the spectrum, under the B1 emissions scenario of the Special Report on Emissions Scenarios (2001), global sea levels are expected to rise from between 0.18 to 0.38 meters over the course of the century. On the opposite end of the spectrum, emissions scenario A1F1 predicts a global sea level rise of between 0.25 and 0.6 meters over the same time period. There is still a significant amount of uncertainty in these projections, as records on sea level rise remain relatively short and there are uncertainties relating to the loss of land ice (Meehl et al., 2007).

Table 2: Identified sectors of concern in Pacific countries

	Coastal Zones	Water Resources	Agriculture	Health	Marine resources/ Fisheries	Forestry	Biodiversity and nature	Tourism	Public awareness	Policy integration	Research, Meteorology
Cook Islands	✓	✓	✓		✓		✓	✓			
Micronesia	✓	✓			✓	✓			✓	✓	✓
Fiji	✓	✓	✓	✓		✓		✓		✓	
Kiribati	✓	✓	✓	✓	✓		✓				✓
Marshall Islands	✓	✓	✓	✓	✓				✓	✓	✓
Nauru	✓	✓		✓	✓		✓		✓		
Niue	✓	✓	✓	✓		✓	✓		✓	✓	
Palau	✓	✓	✓	✓	✓	✓			✓	✓	
Papua New Guinea	✓		✓	✓	✓	✓					
Samoa	✓	✓	✓	✓		✓	✓				✓
Solomon Islands	✓	✓	✓	✓	✓			✓	✓		✓
Tonga	✓	✓	✓	✓	✓	✓			✓	✓	
Tuvalu	✓	✓	✓	✓	✓						
Vanuatu	✓	✓	✓	✓	✓	✓		✓			

Source: CIES (1999); FMFNP (2005); FSM (1999); FSM (2009); KMELAD (2007); MIEPA (2000); NDIDI (1999); NiMS (2000); PNGMEC (2000); POERC (2002); SIMCTA (2004); SMNREM (2005); TDE (2005); TMNRE (1999); TMNRE (2007); VMIPU (2007).

capital cities of Pacific Island states, as well as the majority of the population of these island nations (Mimura et al., 2007).

In addition to these coastal impacts, rising ocean temperatures, changes in the occurrence and intensity of the El Niño Southern Oscillation and damage to coral are expected to affect fish circulation patterns, and may cause a decline in primary production of fisheries in tropical oceans (FAO, 2008; Mimura et al., 2007).[16] Given that the fisheries sector is a key source of income (and food security) for many Pacific Islanders, these changes may have significant economic impacts for these countries (Oxfam, 2009).[17]

Adaptation measures proposed by countries within the Pacific region to address the vulnerability of coastal zones and the fisheries sector include: the establishment of land-use policies that encourage settlement away from low-lying areas; mangrove and reef protection measures, including creation of

[16] The health of coral reefs and the marine ecosystems that support fisheries is also likely to be affected by "rising sea level, increased turbidity, nutrient loading and chemical pollution, damage from tropical cyclones, and decreases in growth rates due to the effects of higher carbon dioxide concentrations on ocean chemistry" (Minura et al., 2007: 689).
[17] Within certain countries in the region, fish exports account for up to 73 per cent of total exports (FAO, 2008).

protected areas; establishment of a sea level monitoring center; improved public awareness; upgrade and restoration of coastal defenses; establishment of early-warning systems; resettlement of urban areas; and marine breeding and restocking programs (FMFNP, 2005; KMELAD, 2007; PNGMEC, 2000; SIMCTA, 2004; SMNREM, 2005; TDE, 2005).

Water

Most small islands already experience limited access to freshwater resources due to their small size, geology and topography. The quality and quantity of water resources within the Pacific are very likely to be further compromised by climate change through a potential combination of reduced precipitation,[18] more variable rainfall, coastal inundation and salt water intrusion, along with non-climatic factors such as deforestation, possible soil erosion and pollution (Mimura et al., 2007; SMNREM, 2005; SIMCTA, 2004). In the past, periods of droughts have depleted rainfall collection supplies and parched aquifers within Pacific Island nations (FAO, 2008).

Countries in the Pacific region have proposed an array of adaptation actions to address vulnerability within the water sector, including: instituting water catchment management and soil conservation measures to reduce erosion and sedimentation; flood control measures; development of alternate water resources, including groundwater, rainwater collection and desalinization; and water conservation programs, including demand management and leakage control (FMFNP, 2005; KMELAD, 2007; SIMCTA, 2004; TDE, 2005).

Agriculture

In Pacific Island countries, approximately 70 per cent of crops are dependent upon seasonal summer rains (FAO, 2008). Many of the larger Pacific Islands have invested in commercial cropping to earn foreign exchange, and agriculture contributes substantially to these countries' economic livelihoods (FAO, 2008).[19] In other countries (including the Solomon Islands and Vanuatu), approximately 75 per cent of the population is dependent upon subsistence agriculture for their livelihoods (World Bank, 2009). A disruption in agricultural production through changes brought about by climate change—including through saltwater intrusion into freshwater resources, soil salinization, increases in pests and diseases, flooding, landslides and declining availability of water resources—would therefore have a considerable negative impact on these countries' economies.

Adaptation options proposed in the agriculture sector include: research into flexible farming options, salt-resistant crops, and heat-tolerant species; cessation of crop production on marginal and sloping lands; agroforestry techniques; pest and disease management; and crop diversification (FMFNP, 2005; SIMCTA, 2004; VMIPU, 2007).

[18] For example, it is projected that should Kiribati experience a 10 per cent decline in its average rainfall, the freshwater lens on its Tarawa Atoll could be reduced by 20 per cent (Mimura et al., 2007).

[19] For example, Fiji historically has relied heavily on its sugar industry, which employed 25 per cent of its workforce (Mimura et al., 2007) and continues to constitute one-third of the country's industrial activity (CIA, 2011).

Human health

Increased temperatures, variable rainfall, and more extreme weather events associated with future climate change are anticipated to affect human health within the Pacific, including a possible increase in the incidence of malaria, dengue fever, diarrhea, and other illnesses (Mimura et al., 2007). Health may also be impacted by compromised food security, severe storms, drought, and declines in water quality and quantity (PNGMEC, 2000). The vulnerability of Pacific Islanders to the health impacts of climate change is increased by existing weak health care systems, inadequate infrastructure and poor waste management practices (Minura et al., 2007).

Measures proposed to address adaptation needs within the health sector include: dengue fever control through prevention and epidemic preparedness; improved safety and sanitation of water; public health emergency strategies; malaria awareness programs; and improved medical services (FMFNP, 2005; SIMCTA, 2004; SMNREM, 2005).

Forestry, biodiversity and nature

Forests and other island ecosystems are important aspects of Pacific Island environments, acting as sources for food, income, medicine, fuel and building materials (FAO, 2008). Despite the small land area of Pacific Islands, 16 countries contain 524,369 hectares of mangroves, or approximately 3 per cent of the world's mangrove ecosystems (Gilman, 2006: 3). While serving to protect coastal areas, mangrove ecosystems also are very vulnerable to climate disturbances, including extreme weather events, changes in precipitation, coastal erosion, soil degradation and other impacts. By 2100, it is projected that a 13 per cent reduction in coverage of mangroves could occur on Pacific Islands where this ecosystem is indigenous (Gilman, 2006: 9).

The unique ecosystems of Pacific nations are also closely linked to these countries' tourism sectors. The future development of this sector could be undermined by accelerated beach erosion, degradation and bleaching of coral reefs, damage to coastal infrastructure, reduced access to freshwater sources and a potential increase in vector-borne diseases (Mimura et al., 2007).

Adaptation measures proposed to address these vulnerabilities include: enhanced research into the possible impacts of climate change on flora and fauna as well as ecosystem rejuvenation; integration of climate change into environmental and natural resources policies; reforestation programs; conservation programs; and the promotion of agroforestry, land use policies, and generation of public awareness (CIES, 1999; KMELAD, 2007; MIEPA, 2000; SMNREM, 2005).

5.0 Assessment of Adaptation Action within the Pacific Region

Policy and programmatic adaptation action is occurring within the Pacific region at the regional and national levels, although the degree of effort varies substantially between countries. Most project activity is occurring at the regional level, a reflection of Pacific Island countries' shared adaptation

concerns and priorities, as well as their relatively small populations. This observation is also a reflection of the fact that Pacific Island states have traditionally taken a regional approach to addressing development issues through various intergovernmental organizations, including:

- The Secretariat of the Pacific Community (SPC),[20] including its Applied Geoscience and Technology Division (SOPAC);[21]
- The Secretariat to the Pacific Regional Environmental Program (SPREP);[22]
- The Pacific Islands Forum;[23] and
- The Council of Regional Organizations of the Pacific (CROP), which was established by the Pacific Island Forum to improve cooperation and coordination between the various intergovernmental regional organizations in the Pacific. SPREP and SPC are members of CROP.

Pacific Island countries are also striving to achieve common development goals through policy initiatives such as the *Cairns Compact on Strengthening Development Coordination in the Pacific*. Adopted in August 2009 by the Pacific Islands Forum Leaders, the compact's objective is to "drive more effective coordination of available development resources" by Forum members and their development partners in order to achieve real progress towards the Millennium Development Goals (PIFS, 2009: 1).[24]

[20] The Secretariat of the Pacific Community provides technical and policy advice and assistance, as well as training and research services, to Pacific Island countries on a range of issues, including health, climate change and fisheries. It is the most inclusive regional organization, with 26 members. These members include 22 Pacific Island countries and territories: American Samoa, Cook Islands, Federated States of Micronesia, Fiji, French Polynesia, Guam, Kiribati, Marshall Islands, Nauru, New Caledonia, Niue, Northern Mariana Islands, Palau, Papua New Guinea, Pitcairn Islands, Samoa, Solomon Islands, Tokelau, Tonga, Tuvalu, Vanuatu and Wallis and Futuna; and the four founding partner countries of Australia, France, New Zealand and the United States. For more information see: http://www.spc.int/.

[21] SOPAC previously was the Pacific Islands Applied Geoscience Commission, but its core work program has been substantially transferred and integrated into the Secretariat of the Pacific Community as of January 1, 2011. The member states of SOPAC are: American Samoa, Australia, Cook Islands, FSM, Fiji, French Polynesia, Guam, Kiribati, Marshall Islands, Nauru, New Caledonia, New Zealand, Niue, Palau, Papua New Guinea, Samoa, Solomon Islands, Tokelau, Tonga, Tuvalu and Vanuatu. For more information visit: http://www.sopac.org/.

[22] SPREP seeks to promote cooperation between Pacific Islands, protect and improve the environment, and ensure sustainable development among its member states. The members states of SPREP are: American Samoa, Australia, Cook Islands, Federated States of Micronesia, Fiji, French Polynesia, Guam, Kiribati, Marshall Islands, Nauru, New Caledonia, New Zealand, Niue, Northern Mariana Islands, Palau, Papua New Guinea, Samoa, Solomon Islands, Tokelau, Tonga, Tuvalu, Vanuatu, and Wallis and Futuna, as well as France and the United States.

[23] The Pacific Islands Forum is composed of 16 countries: Australia, Cook Islands, Federated States of Micronesia, Fiji, Kiribati, Nauru, New Zealand, Niue, Palau, Papua New Guinea, Republic of Marshall Islands, Samoa, Solomon Islands, Tonga, Tuvalu and Vanuatu. The goals of the Forum are to stimulate economic growth and enhance political governance and security for the region, and to strengthen regional cooperation and integration. For more information, visit: http://www.forumsec.org.fj/.

[24] To achieve its objective, the Cairns Compact is based on pursuit of the following principles: (1) recognition that broad-based, private sector-led growth is essential to achieving faster development progress; (2) improved governance and service delivery are essential to faster development progress; (3) greater investment is needed in infrastructure; (4) "country leadership, mutual accountability and mutual responsibility between Forum Island countries and their development partners are fundamental to successful development outcomes;" (5) following best-practices of the Paris Declaration on Aid Effectiveness and the Accra Agenda for Action; and (6) greater commitment to achieving the Millennium Development Goals (PIFS, 2009: 1-2).

5.1 Regional Level Action

Pacific Island countries are engaged in a number of regional level policy coordination initiatives concerning climate change adaptation. These initiatives include *The Pacific Plan for Strengthening Regional Cooperation and Integration* endorsed at the October 2005 meeting of the Pacific Islands Forum by Forum Leaders. The goal of the Plan is to "enhance and stimulate economic growth, sustainable development, good governance and security for Pacific countries through regionalism" (PIFS, 2005: 2). One of the Plan's five themes for the period of 2010 to 2012 is addressing the impacts of climate change (PIFS, 2010).

In 2005, Pacific Island leaders also endorsed the *Pacific Islands Framework for Action on Climate Change* (PIFACC), which covers the period of 2006 to 2015. The goal of this Framework is to build the capacity of Pacific Island countries to enhance their resilience to climate change and to deliver outcomes under the following principles: implementing adaptation measures; governance and decision-making; improving understanding of climate change; education, training and awareness; contributing to global greenhouse gas reductions; and partnerships and cooperation. An Action Plan that sets out national and regional activities supportive of achieving the Framework's principles was subsequently prepared by SPREP (SPREP, 2007).[25] A mid-term review of the PIFACC and its Action Plan completed in 2010 judged it to be an important document for sharing regional and national actions, but required greater links to other processes and focus on strategic actions (Hay, 2010). Awareness and use of it was also found to be limited, as well as the need for a framework for monitoring progress of climate change action. A revised Framework was released in September 2011 (SPREP, 2011).

Complementing activities under the PIFACC,[26] the Pacific Climate Change Roundtable (PCCR) is convened biannually by SPREP to review the state of regional climate change cooperation. Meetings of the PCCR are open to all interested parties, including representatives of development agencies and partners, civil society, non-governmental organizations, academic and research institutions, and other groups assisting Pacific Island countries and territories in their efforts to adapt to climate change. At the October 2009 PCCR meeting, delegates agreed to explore establishment of a Pacific Regional Climate Change Fund that would be coordinated regionally. Options for a fund were presented in October 2010 (Carbon Market Solutions, 2010) and means of increasing climate financing in the region were discussed at the March 2011 PCCR meeting (PCCR, 2011).

There are also a high number of regional-level initiatives engaged in disaster risk reduction activities, many of which have clear climate change adaptation benefits and have explicitly integrated

[25] The Action Plan identifies options for achieving the objectives of each principle of the PIFACC. These actions focus on food security and agriculture, health, coastal areas, infrastructure and water resources, and also touch upon tourism, land-based resources, fisheries, industry and biodiversity. A matrix of current and planned projects and programs in the region was to be prepared to ensure better coordination and leveraging of activities (SPREP, 2007).
[26] The PCCR is responsible for monitoring and facilitating implementation of the PIFACC (PIFS, 2010).

adaptation concerns within their programs and strategies. The mandated regional agency dealing with natural disaster risk reduction is SOPAC, which oversees implementation of the Pacific Islands' *Disaster Risk Reduction and Disaster Management Framework for Action 2005–2015*. This Framework mentions the importance of anticipating the future impacts of climate change, and could address concerns regarding the need for better integration of the disaster risk reduction and climate change adaptation communities within the Pacific (World Bank, 2009).

In addition to the coordination occurring at the policy level in the Pacific, these countries are participating in a number of regional projects that address climate change adaptation concerns, as described in Table 3. Examples of current adaptation projects involving multiple Pacific Island countries include:

- "Adapting to Climate Change in the Pacific Island Region;"
- "Coping with Climate Change in the Pacific Island Region;"
- "International Climate Change Adaptation Initiative;"
- "Pacific Islands Adaptation to Climate Change Project (PACC);"
- "Pacific Mangroves Initiative;"
- "Programmes for Water Safety Plans in Pacific Island Countries;"
- "Strengthening the Capacity of Pacific Developing Member Countries to Respond to Climate Change;" and
- "Vulnerability and Adaptation Initiative."

These regional projects address a variety of priority concerns of Pacific Island countries, with an emphasis on needs related to improved management of water resources, coastal zone management, agriculture, and policy and planning. Other sectors addressed through these projects include strengthening meteorological systems, infrastructure, health, forestry, conservation, tourism and education. Although the majority of projects are focused on capacity building, policy and planning, and research, several projects also finance the implementation of pilot adaptation measures.

Regional collaboration on climate change is expected to continue in the future through projects that currently are being developed. For example, the European Union (2011) has announced a program to support climate change capacity development in the Pacific Islands.[27] As well, Papua New Guinea and the Solomon Islands, along with Malaysia, the Philippines and Timor-Leste, have submitted the project "Adaptation in the Coral Triangle" to the Special Climate Change Fund (SCCF) for consideration.

[27] The announced objective of this project is to undertake field level activities such as the replanting of mangroves, reforestation of watersheds, introduction of drought/salt resistant cultivars, soil conservation efforts, water conservation and rainwater harvesting, and raising of infrastructure. Funding in the amount of €8.0 million has been allocated to this project (European Union, 2011).

Pacific Island countries are also participating in a small number of projects that bring together countries from Asia and the Pacific, including: "Promoting Climate Change Adaptation in Asia and Pacific," "Strengthening the Asia Pacific Adaptation Network," and "Enabling Climate Change Responses in Asia and the Pacific." The Solomon Islands and Vanuatu are also participating in the "Global Climate Change Alliance" while PNG, Samoa and Tonga are part of the Pacific-focused regional program of the "Pilot Program for Climate Resilience." Addressing multiple sectors, these projects typically have a strong emphasis on knowledge generation, knowledge sharing and facilitating the integration of adaptation into policy implementation.

The most significant funders of regional and global project in the region are the Governments of Australia, Germany and the United States, along with the Asian Development Bank (ADB). Other funders include the governments of the European Commission, Global Environment Facility (GEF), SCCF, United Nations Human Settlements Programme (UN-HABITAT), World Bank, World Health Organization (WHO) and the governments of Canada, Japan and the United Kingdom.

Table 3. Current regional actions in the Pacific Region

<table>
<tr><th colspan="2">Name</th><th>Objectives</th><th>Participating Countries</th><th colspan="2">Project Details</th></tr>
<tr><td colspan="6">Regional Initiatives</td></tr>
<tr><td rowspan="7">1.</td><td rowspan="7">Pacific Islands Climate Prediction Project[28]</td><td rowspan="6">The project aimed to expand understanding of how seasonal climate prediction services can be applied to support climate-sensitive decision making and the use of climate predictions by National Meteorological Services (NMS) and industries/agencies which use climate information (e.g., farmers, tourism, water resource managers and health authorities). Along with the provision of software tailored to local circumstances and training in the effective use of climate predictions in a risk management context, the project undertook specific pilot activities.</td><td rowspan="6">Cook Islands, Fiji, Kiribati, Niue, Papua New Guinea, Samoa, Solomon Islands, Tonga, Tuvalu and Vanuatu</td><td>Funder(s)</td><td>AusAID</td></tr>
<tr><td>Total Budget</td><td>AU$3.0 million</td></tr>
<tr><td>Implementing Agency(s)</td><td>Australia Bureau of Meteorology</td></tr>
<tr><td>Duration</td><td>Phase I: 2004–2006
Phase II: 2007–2009 (completed)</td></tr>
<tr><td>Project Type</td><td>Research; Capacity building</td></tr>
<tr><td>Focus Area(s)</td><td>Climate information services</td></tr>
<tr><td colspan="4">Selected Pilot Projects:
• Climate and Oceanographic Variability and their Impacts on Fisheries:[29] Objective was to develop and deliver a "Fisheries Guide"[30] designed to improve the awareness of NMS staff</td></tr>
</table>

[28] BOM, http://www.bom.gov.au/climate/pi-cpp/ and http://www.adaptationlearning.net/project/pacific-islands-climate-predictions-project-pi-cpp
[29] BOM, http://www.bom.gov.au/climate/pi-cpp/pilot_projects/fisheries_guide.shtml
[30] BOM, http://www.bom.gov.au/climate/pi-cpp/workshops/Fisheries-guide.pdf

Name		Objectives	Participating Countries	Project Details	
		of the impact of meteorological and oceanographic conditions on resource availability and fishing effort; how to better access relevant supporting data and information; and how to present it to interested stakeholders. Completed in 2005. • Application of Climate Forecasting in Water Management:[31] Objective was to develop the capability of NMS staff to provide climatological information including forecasts of droughts and their likely impacts on water resources to water agencies and other stakeholders. Completed in 2008.			
2.	Regional Partnerships for Climate Change Adaptation and Disaster Preparedness[32]	The outcome is expected to be a strengthened information system that will support informed decision making aimed at minimizing the negative social and environmental impacts of catastrophic events. It will also mitigate the financial risk of participating Pacific developing member countries to the effects of natural disasters, including those exacerbated by human-induced climate change. This work is linked to the World Bank's work on the development of a Caribbean Catastrophe Insurance Facility for the Pacific.	Phase 1: Cook Islands, Fiji, Papua New Guinea, Samoa, Solomon Islands, Tonga, Tuvalu, and Vanuatu	**Funder(s)** **Total Budget** **Implementing Agency(s)** **Duration** **Project Type** **Focus Area(s)**	ADB US$1.0 million World Bank 2007–2011 Capacity building Disaster risk management
3.	Programmes for Water Safety Plans in Pacific Island Countries[33]	The program promoted development and implementation of a "catchment to consumer" risk-management approach to safe drinking water for both urban and rural Pacific communities. Project outputs include development of a framework for action to protect human health from effects of climate change in the Asia Pacific Region.	Pacific Island countries	**Funder(s)** **Total Budget** **Implementing Agency(s)** **Duration** **Project Type** **Focus Area(s)**	AusAID; WHO AU$0.75 million SOPAC; WHO 2008–2009 Capacity building Human health; Freshwater supply
4.	International Climate Change Adaptation Initiative[34]	To help the most vulnerable countries adapt to the impacts of climate change. It includes four components: (a) improved scientific information and understanding; (b)	Pacific and Timor-Leste (focus on islands neighboring Australia)	**Funder(s)** **Total Budget** **Implementing Agency(s)** **Duration**	AusAID AU$328.2 million 2008–2011

[31] BOM, http://www.bom.gov.au/climate/pi-cpp/pilot_projects/water_mgt.shtml
[32] ADB, http://www.adb.org/Projects/project.asp?id=41187
[33] ALM, http://www.adaptationlearning.net/program/programmes-water-safety-plans-pdmcs
[34] AusAID, http://www.ausaid.gov.au/keyaid/adaptation_initiative.cfm. Because this is an umbrella initiative, some of the projects described below may fall under this category/pool of money (although not explicitly mentioned on the website).

Name		Objectives	Participating Countries	Project Details	
		strategic planning and vulnerability assessments; (c) implementing, financing and coordinating adaptation measures; (d) multilateral support for climate change adaptation.		**Project Type**	Research; Field implementation; Capacity building
				Focus Area(s)	Multi-sectoral
		All activities coordinated through **Australia-Pacific Climate Adaptation Platform.** Works with Pacific Island countries, regional and international organizations, and other donors. **Key activities include:** • *Pacific Climate Change Science Program* (AU$20 million: 2009–2011): Helping Pacific Island countries and East Timor better understand how climate change will impact them.[35] • *Pacific Bilateral adaptation program* (AU$25 million: 2009–2011): Helping to implement priority adaptation actions in 14 Pacific Island countries.[36] • *Pacific Adaptation Strategy Assistance Program* (AU$12 million: 2009–2011): Strengthening the capacity of partner countries in the Pacific and East Timor to assess vulnerabilities to climate change and develop evidence-based adaptation strategies.[37] • *Pacific Futures Climate Leaders Program* (AU$3 million: 2010–2011): Strengthening the capacity of the region to make informed adaptation decisions supporting the development and implementation of climate change education programs at the University of the South Pacific, including provision of up to 26 scholarships.[38] • *Community-based Adaptation Activity Grants* (AU$2.7 million 2010–2011): Support Australian and international NGOs to work with local organizations to scale up community-based adaptation activities.			
5.	Vulnerability and Adaptation Initiative[39]	Through this initiative, six Pacific countries have implemented activities to reduce their vulnerability to climate change and achieve good environmental outcomes. The Initiative has funded activities such as the replanting of coastal mangroves to protect shorelines, the construction of rain water tanks in islands affected by seasonal drought, the trialing of versatile crop varieties and the recording of traditional knowledge about disaster preparation.	Fiji, Samoa, Solomon Islands, Tonga, Tuvalu and Vanuatu	**Funder(s)**	AusAID
				Total Budget	
				Implementing Agency(s)	
				Duration	2008–2012
				Project Type	Field implementation; Capacity building
				Focus Area(s)	Multi-sectoral
6.	Pacific Islands Adaptation to Climate	PACC will implement long-term adaptation measures to increase	Cook Islands, FSM, Fiji, Marshall	**Funder(s)**	SCCF, co-financing
				Total Budget	US$59,526,299

[35] CSIRO, http://www.csiro.au/partnerships/Pacific-Climate-Change-Science-Program.html
[36] Personal communication with The National Conservancy (TNC), July 2011.
[37] Personal communication with The National Conservancy (TNC), July 2011.
[38] Personal communication with The National Conservancy (TNC), July 2011.
[39] AusAID, http://www.ausaid.gov.au/country/pacific/climate_change.cfm

Name		Objectives	Participating Countries	Project Details	
	Change Project (PACC)[40]	the resilience of a number of key development sectors in the Pacific Islands to the impacts of climate change. This objective will be achieved by focusing on adaptation response strategies, policies and measures to bring about this result. The key development sectors this project will focus on are: 1. water resources management; 2. food production and food security; and 3. coastal zone and associated infrastructure (roads and breakwater). To ensure sustainability of the project, regional and national adaptation financing instruments will constitute a fourth component of the project.	Islands, Nauru, Niue, Palau, Papua New Guinea, Samoa, Solomon Islands, Tonga, Tuvalu, Vanuatu	**Implementing Agency(s)**	UNDP; ADB; SPREP
				Duration	2008–2012
				Project Type	Capacity building; Policy formation and integration
				Focus Area(s)	Agriculture; Coastal zone management; Fresh water supply
7.	Coastal and Marine Resources Management in the Coral Triangle of the Pacific (under the Pacific Alliance for Sustainability Program and the Coral Triangle Initiative)[41]	To promote the conservation and sustainable use of globally significant coastal and marine resources in the Coral Triangle region through the introduction of integrated and ecosystem-based coastal and marine resources management in five Pacific countries. Includes the implementation of pilot adaptation measures to enhance resilience and increase capacity to respond to the adverse impacts of climate change on coastal and marine ecosystems.	FSM, Fiji, Palau, Papua New Guinea, Solomon Islands and Vanuatu *Plus:* Timor-Leste	**Funder(s)**	GEF-SPA; Japan; Australia; United States
				Total Budget	US$27,568,183
				Implementing Agency(s)	ADB (lead)
				Duration	2008–2013
				Project Type	Capacity building, Research; Field implementation
				Focus Area(s)	Coastal zone management; Marine management
8.	Strengthening the Capacity of Pacific Developing Member Countries to Respond to Climate Change (Phase 1)[42]	Incorporation of climate risk management, adaptation practices, and greenhouse gas mitigation measures into infrastructure and key sector investment plans and project designs. Adaptation related actions include: • Pacific Climate Change Program—will assist participating	Cook Islands, Fiji, Federated States of Micronesia, Kiribati, Marshall Islands, Nauru, Palau, Papua New Guinea, Solomon Islands, Samoa, Tonga, Tuvalu,	**Funder(s)**	ADB; Canada
				Total Budget	US$4.965 million
				Implementing Agency(s)	ADB
				Duration	2009–?
				Project Type	Capacity building; Policy formation and integration

[40] GEF, http://www.thegef.org/gef/sites/thegef.org/files/documents/document/09-16-08-SCCF.pdf
[41] GEF, http://www.gefonline.org/projectDetailsSQL.cfm?projID=3591
[42] ADB, http://pid.adb.org/pid/TaView.htm?projNo=43071&seqNo=01&typeCd=2#timetable

Name		Objectives	Participating Countries	Project Details	
		countries to improve their resilience to climate change impacts through (i) mainstreaming of the adaptation in their policies, plans, programs, and projects; and (ii) strengthening their systems and capabilities to foster the adaptation process; and • Adaptation preparation—up to five countries will be supported in preparing the implementation of climate change adaptation plans, including further capacity building	Vanuatu *Plus:* Timor-Leste	**Focus Area(s)**	Government
9.	South–South Cooperation between Pacific and Caribbean SIDS on Climate Change on Climate Change Adaptation and Disaster Risk Management[43]	The project seeks to strengthen the safety and resilience of Pacific and Caribbean SIDS communities to a range of natural hazards by facilitating and supporting a South–South cooperation program targeted at strengthening climate change adaptation and disaster risk reduction capacity in SIDS, based on the transfer of appropriate "southern" expertise and technologies.	Pacific and Caribbean SIDS (not specified)	**Funder(s)**	UNDP's Special Unit for South-South Cooperation and the UNDP–Japan Partnership Fund
				Total Budget	US$809,978
				Implementing Agency(s)	UNDP Pacific Centre[44]
				Duration	2009–2011
				Project Type	Capacity building; Knowledge communication
				Focus Area(s)	Disaster risk management
10.	Coping with Climate Change in the Pacific Island Region[45]	Enhance the competence and capabilities of the local population, the national governmental authorities and regional organizations—SPC and SPREP—in order to cope with the effects of climate change and combat its	FSM, Fiji, Kiribati, Marshall Islands, Nauru, Palau, PNG, Samoa, Solomon Islands, Tonga, Tuvalu, Vanuatu	**Funder(s)**	German Federal Ministry for Economic Cooperation and Development (BMZ)
				Total Budget	€17.2 million
				Implementing Agency(s)	GIZ, SPC

[43] UNDP, http://www.undppc.org.fj/pages.cfm/newsroom/press-releases/2010/looking-south-across-oceanspacific-caribbean-sids-share-experiences.html and http://www.pacificdisaster.net/pdnadmin/data/original/UNDP_2010_SouthSouth_SIDS_interimreport.pdf

[44] Partners in the Caribbean include Caribbean Disaster and Emergency Management Agency, the National Cuban Meteorological Institute (INSMET), CCCCC and University of the West Indies. Key partners from the Pacific region include the Pacific Islands Applied Geo-Science Commission, South Pacific Regional Environmental Programme, the Secretariat of the Pacific Community and the University of the South Pacific.

[45] GIZ, http://www.gtz.de/en/weltweit/asien-pazifik/27718.htm and SPC, http://www.spc.int/lrd/index.php?option=com_content&view=article&id=478&Itemid=44

Name		Objectives	Participating Countries	Project Details	
		causes. It includes reviewing policies and integrating adaptation considerations into them, and focuses on the management of land and coastal natural resources, as well as tourism. At the regional level, the program aligns with the Pacific Island Framework for Action on Climate Change 2006–2015. Originally only involving Fiji, Tonga, Vanuatu, the project has been expanded and extended.		**Duration**	2009–2015
				Project Type	Capacity building; Policy formation and integration; Field implementation
				Focus Area(s)	Agriculture; Forestry; Tourism
11.	Pacific Mangroves Initiative[46]	Data will be collected and analyzed to identify climate risks and assist participating countries to create policies for management and restorations of mangroves and associated ecosystems. Public awareness will also be part of the project.	Fiji, Samoa, Solomon Islands, Tonga, Vanuatu	**Funder(s)**	German Federal Environment Ministry
				Total Budget	€2,297,249
				Implementing Agency(s)	IUCN, University of the South Pacific, SPREP
				Duration	2009–2013
				Project Type	Research; Capacity building
				Focus Area(s)	Coastal zone management; Government
Participation in projects exclusively involving Asian and Pacific countries					
12.	Promoting Climate Change Adaptation in Asia and Pacific[47]	The purpose of the project is for participating governments to have an improved understanding of the necessary actions they must take to adapt to climate change. The project Includes three phases: Phase 1 focusing on establishment of a regional information system for climate change adaptation, assessment of countries' adaptation programs, institutional assessments, and identification of geographic or sector blocks. Phase 2 comprises definition of knowledge gaps in major sectors, and drafting of a detailed work program in relation to the	Asia and Pacific	**Funder(s)**	DFID
				Total Budget	£1,391,680
				Implementing Agency(s)	ADB
				Duration	2008–2012
				Project Type	Capacity building
				Focus Area(s)	Agriculture; Biodiversity

[46] BMU, http://www.bmu-klimaschutzinitiative.de/en/projects?p=1&d=525
[47] DFID, http://projects.dfid.gov.uk/project.aspx?Project=113856

Name		Objectives	Participating Countries	Project Details	
		knowledge gaps. Phase 3 comprises specific studies and pilot projects in selected countries.[48]			
13.	U.S. Support Program to the Coral Triangle Initiative (CTI)[49]	To improve the management of biologically and economically important coastal and marine resources and associated ecosystems that support livelihoods and economies in the Coral Triangle and assist the six CTI countries in implementing the CTI Regional and National Plans of Action with activities that focus on instituting an ecosystem approach to fisheries management, creating marine protected areas, building climate change adaptive capacity and establishing regional platforms to promote cross-country learning and enhance sustainability.	Indonesia, Malaysia, Philippines, **Papua New Guinea**, **Solomon Islands**, Timor Leste	**Funder(s)**	USAID
				Total Budget	US$41 million
				Implementing Agency(s)	WWF, Conservation International, the Nature Conservancy, ARD Inc., NOAA
				Duration	2008–2013
				Project Type	Capacity building; Assessment; Field implementation
				Focus Area(s)	Marine management
14.	Strengthening the Asia Pacific Adaptation Network[50]	Comprehensive gap analysis and need assessment, establishment of an online knowledge portal to disseminate work of Asia Pacific Climate Change Adaptation Network to encourage knowledge linkages.	Asia and the Pacific	**Funder(s)**	ADB, A.T.F. FINNIDA Grant
				Total Budget	US$350,000
				Implementing Agency(s)	ADB
				Duration	2010–?
				Project Type	Knowledge communication
				Focus Area(s)	Multi-sectoral
15.	Enabling Climate Change Responses in Asia and the Pacific[51]	Expected outputs are improved macro-level scientific and economic data at national and subnational level to assist decision making, identification of "no-regret" strategies, greater partnerships with both civil society and private sector in assisting with mitigation and adaptation activities. Impact is increased nationally appropriate responses to climate change and	Asia and the Pacific	**Funder(s)**	ADB
				Total Budget	US$6.5 million
				Implementing Agency(s)	ADB
				Duration	2010–?
				Project Type	Research; Knowledge communication
				Focus Area(s)	Multi-sectoral

[48] ADB, http://www.adb.org/Projects/project.asp?id=39343
[49] CTI, http://www.uscti.org/uscti/default.aspx
[50] ADB, http://pid.adb.org/pid/TaView.htm?projNo=44126&seqNo=01&typeCd=2
[51] ADB, http://www.adb.org/Projects/project.asp?id=44158

Name		Objectives	Participating Countries	Project Details	
		disasters with support from civil society and the private sector.			
Participation in Global Adaptation Programs					
16.	Preparedness for Climate Change[52]	The aim of this program was for the Red Cross and Red Crescent National Societies in countries particularly vulnerable to climate change to gain a better understanding of climate change and its impacts to identify country-specific adaptation measures in line with risks. Activities could include organizing a workshop on risks, assessment of risks through preparation of a background document, capacity building programs, and developing climate change resilient plans.	39 countries *Pacific participants in Phase 1:* **Cook Islands, Kiribati, Solomon Islands, Tonga**	**Funder(s)**	Red Cross/Red Crescent Climate Centre
				Total Budget	
				Implementing Agency(s)	National Red Cross/Red Crescent Societies
				Duration	Phase 1: 2006–2009 Phase 2: ongoing
				Project Type	Capacity building; Policy formation and integration
				Focus Area(s)	Disaster risk management
17.	The Global Climate Change Alliance (GCCA)[53]	The Global Climate Change Alliance seeks to deepen the policy dialogue between the European Union and developing countries on climate change; and to increase support to target countries to implement priority adaptation and mitigation measures, and integration climate change into their development strategies. The program's five priority areas for funding are: improving the knowledge base of developing countries to the effects of climate change; promoting disaster risk reduction; mainstreaming climate change into poverty reduction development strategies; reducing emissions from deforestation and degradation; and enhancing participation in the Clean Development Mechanism.	18 countries[54] including **Solomon Islands**, **Vanuatu** and the Pacific Region as a whole	**Funder(s)**	European Commission, Czech Republic, Sweden, 10th European Development Fund
				Total Budget	€140 million
				Implementing Agency(s)	National Governments
				Duration	2008–ongoing
				Project Type	Policy formation and implementation; Knowledge management
				Focus Area(s)	Disaster risk management; Government
18.	Pilot Program for Climate Resilience	PPCR aims to pilot and demonstrate ways in which climate risk and	*Regional Programs:*	**Funder(s)**	World Bank's Strategic Climate

[52] IFRC, http://www.climatecentre.org/site/preparedness-for-climate-change-programme
[53] GCCA, http://www.gcca.eu/pages/1_2-Home.html
[54] These countries are: Bangladesh, Belize, Cambodia, Ethiopia, Guyana, Jamaica, Maldives, Mali, Mozambique, Mauritius, Nepal, the Pacific Region, Rwanda, Senegal, Seychelles, Solomon Islands, Tanzania and Vanuatu.

Name		Objectives	Participating Countries	Project Details	
	(PPCR)[55]	resilience may be integrated into core development planning and implementation in a way that is consistent with poverty reduction and sustainable development goals. In this way, the PPCR provides incentives for scaled-up action and initiates transformational change. The pilot programs and projects implemented under the PPCR are country-led, build on NAPAs and other relevant country studies and strategies.	Caribbean and Pacific (includes **Papua New Guinea**, **Samoa**, **Tonga**) *Country programs:* Bangladesh, Bolivia, Cambodia, Mozambique, Nepal, Niger, Tajikistan, Yemen, Zambia		Fund
				Total Budget	US$971.75 million pledged as of February 2011
				Implementing Agency(s)	World Bank
				Duration	2008–present
				Project Type	Policy formation and integration
				Focus Area(s)	Multi-sectoral
19.	Cities and Climate Change Initiative Asia Pacific[56]	This initiative aims to strengthen the climate change response of cities and local governments. The main objectives are to: promote active climate change collaboration between local governments and associations; to enhance policy dialogue on climate change; to support local governments in preparing climate action plans; and to foster awareness, education and capacity building.	China, **Fiji**, Indonesia, Mongolia, Nepal, **Papua New Guinea**, **Samoa**, Sri Lanka, **Vanuatu** and Viet Nam	**Funder(s)**	UN-Habitat
				Total Budget	US$10 million
				Implementing Agency(s)	Local governments, universities
				Duration	2010–?
				Project Type	Capacity building; Knowledge communication; Policy formation and integration
				Focus Area(s)	Urban areas
20.	Mainstreaming Gender Aspects in Climate Change Adaptation and Low-Carbon Development[57]	This project contributes to mainstreaming gender into climate change adaptation and low-carbon development measures in climate policy. It produces training material and over the long term will improve the adaptive capacity of local communities in Bangladesh and the Pacific region.	Bangladesh, **Kiribati**, **Nauru**, **Republic of Marshall Islands**	**Funder(s)**	German Federal Ministry for the Environment, Nature Conservation, and Nuclear Safety
				Total Budget	€451,339
				Implementing Agency(s)	GenerCC—Women for Climate Justice, Centre for Global Change, Secretariat of the Pacific Community
				Duration	2010–2013
				Project Type	Capacity building

[55] CIF, http://www.climatefundsupdate.org/listing/pilot-program-for-climate-resilience
[56] CCCI, http://www.fukuoka.unhabitat.org/programmes/ccci/index_en.html
[57] BMU, http://www.bmu-klimaschutzinitiative.de/en/projects?p=1&d=673

Name		Objectives	Participating Countries	Project Details	
				Focus Area(s)	Gender
21.	Asia Pacific Climate Change Adaptation Project Preparation Facility (ADAPT)[58]	Increase access to financial resources for climate change adaptation investment projects; strengthen national human and institutional capacity in preparation of financing proposals; and strengthen regional knowledge platform to share information and processes on climate change projects, funds and best practices to promote replication and scaling up.	Bangladesh Cambodia **FSM, Fiji,** Indonesia, Lao PDR, Malaysia, Nepal, **Palau,** Philippines, **Solomon Islands,** Sri Lanka, Thailand, Viet Nam	**Funder(s)**	USAID
				Total Budget	US$18.0 million
				Implementing Agency(s)	WWF, Conservation International, the Nature Conservancy, ARD Inc., NOAA
				Duration	2011–2016
				Project Type	Capacity building; Knowledge communication
				Focus Area(s)	Government

5.2 National Level Action

The level of assessment of adaptation needs as well as adaptation action varies considerably across Pacific Island countries. Each country in the region has prepared a National Communication UNFCCC, while the region's least developed countries—Kiribati, Samoa, Solomon Islands, Tuvalu, and Vanuatu—have each developed a NAPA. In addition, FSM, Fiji, the Marshall Islands, Tuvalu and Vanuatu have developed, or are current developing, national climate change strategies.

As seen in Table 4, the Pacific Island countries with a very low or low number of adaptation projects, relative to other developing Pacific Island countries, are underway in the Cook Islands, FSM, Marshall Islands, Nauru, Niue and Palau. These countries—none of which are classified as being least developed—typically host one to five projects. The remaining countries in the Pacific region host more adaptation projects, with the highest levels of programming occurring in Fiji, PNG, Samoa, the Solomon Islands and Vanuatu. In all countries, adaptation action is dominated by participation in regional programs, as well as a smaller number of Asian and global projects. Only Samoa has developed more than three national projects; the least developed countries of Kiribati, Samoa, Tuvalu and Vanuatu each have a national project financed through the Least Developed Countries Fund (LDCF).[59] It can be observed that although Papua New Guinea has a moderate number of projects underway relative to other countries in the Pacific region, this level of activity could be considered low when judged against its geographical and population size.

The more developed countries in the region (i.e., Fiji, Samoa and Tonga) seem to have undertaken a fuller analysis of their adaptation needs and have articulated a number of specific adaptation projects that could be implemented. Poorer, smaller countries in the region appear to have a greater need for

[58] USDS, http://www.state.gov/documents/organization/151686.pdf
[59] Kiribati and Samoa are also implementing projects financed through the LDCF.

Table 4: Comparison of adaptation action at the policy and program level in the Pacific (as of May 2011)

	Population (est.)[1]	*Policy Action*			*Participation in Projects/Programs*		
		1st National Communication	NAPA	National Strategy/Plan	National	Multi-country	Total
Cook Islands	11,124	1999	*Non-LDC*		1	5	6
Federated States of Micronesia	106,836	1997	*Non-LDC*	2009	0	5	5
Fiji	883,125	2005	*Non-LDC*	In development	0	12	12
Kiribati	100,743	1999	2007		2	5	7
Marshall Islands	67,182	2000	*Non-LDC*	2010	0	4	4
Nauru	9,322	1999	*Non-LDC*		0	4	4
Niue	1,311	2000	*Non-LDC*		0	2	2
Palau	20,956	2002	*Non-LDC*		0	5	5
Papua New Guinea	6,187,591	2000	*Non-LDC*		1	10	11
Samoa	193,161	1999	2005		4	11	15
Solomon Islands	571,890	2004	2009		0	12	12
Tonga	105,916	2005	*Non-LDC*		0	9	9
Tuvalu	10,544	1999	2007	In development	1	6	7
Vanuatu	224,564	1999	2007	In development	1	10	11

Note: *Information contained in this table is based upon research completed as of May 2011. Additional project and programs, for example, may be underway in each country. Full information regarding adaptation action in each country as of May 2011 is available in the Appendix of this report.*

[1] *CIA, World Factbook: https://www.cia.gov/library/publications/the-world-factbook/index.html. Estimated as of July 2011*

basic analyses of the impacts of climate change in order to better understand their vulnerability prior to identifying planned adaptation actions.

Adaptation activities appear to be diversified among a considerably large number of priority sectors, with representation in the areas of forestry, fisheries, nature, coastal zones, agriculture, water, land use management, meteorology, risk reduction, health and tourism.

Funders of the limited number of nationally focused projects in the region are predominantly the LDCF, Australian Agency for International Development (AusAID), Global Facility for Disaster Reduction and Recovery (GFDRR) and World Bank. Other funders include the Asian Development Bank (ADB), the Global Environment Facility and the governments of Japan and New Zealand.

5.3 Communities of Practice

Countries in the Pacific region are participating in two large networks that bring together policy makers and researchers to build knowledge related to climate change adaptation:

- Asia-Pacific Adaptation Network; and
- Adaptation Research Policy Network for Asia and the Pacific.

Other formal communities of practice have not been identified as being active in the region.

Table 5: Select climate change communities of practice in the Pacific

Name	Scope	Category	Sector / area of work
Asia-Pacific Network on Adaptation (AP-Net)[60]	Australia, Cambodia, China, Fiji, Indonesia, Islamic Republic of Iran, Japan, Kazakhstan, Lao People's Democratic Republic, Malaysia, Mongolia, Nepal, Pakistan, Papua New Guinea, Philippines, Republic of Korea, Russian Federation, Samoa, Sri Lanka, Singapore, Thailand, Tonga, Uzbekistan, Vanuatu and Viet Nam	Knowledge sharing; Capacity building	AP-Net is a knowledge-based online clearing house for the Asia-Pacific region on climate change issues. They provide a platform for policy dialogues and consultation within the region; provide access to information and data on climate change issues and developments; and support capacity building for developing countries in the region.
Asia and the Pacific Adaptation Network[61]	Asia and the Pacific	Knowledge generation; Technology sharing; Capacity building; Policy and planning	Initiated by UNEP in 2009 in partnership with other international organizations, governments, foundations and research institutions, this network brings together government representatives and scientists from developed and developing countries. It "provides and shares knowledge and information on adaptation in the region, facilitates developing countries' access to international adaptation finance mechanisms, informs development planning and investment decisions to support adaptation, and develops the capacity of national and local planners, development partners and communities in adaptation." Funding for the network is provided by the ADB, Japan and Sweden.

[60] APN, http://www.climateanddevelopment.org/ap-net/index.html
[61] Asia and the Pacific Adaptation Network, http://www.unep.org/roap/Activities/ClimateChange/AsiaandthePacificAdaptationNetwork/tabid/6837/Default.aspx

6.0 Conclusions

Pacific Island countries are generally actively engaged in climate change adaptation efforts—particularly through multinational policy and program actions. This level of regional cooperation reflects the area's shared vulnerabilities, needs and priorities; the relatively small size and limited human, technical and financial resources of many national governments; and traditional donor flows through regional programs. The level of action in the Pacific also reflects the region's early recognition of its high level of vulnerability to the impacts of climate change and relatively long history of effort to address this problem with the support of the international community.

The high level of political commitment within the region to addressing climate change continues to be reflected in the *Pacific Plan* and work of the Pacific Roundtable on Climate Change. These and other ongoing regional initiatives provide an opportunity for Pacific Islanders to learn from one another regarding best adaptation practices in vulnerable sectors, such as coastal zones, water and agriculture. It also creates space for better coordination of efforts, to ensure that potential synergies are maximized and overlap of adaptation efforts is minimized.

Across the region, adaptation projects appear to be focused on a wide range of identified priorities, although there appears to be a slightly higher level of activity in the areas of water, agriculture, coastal zones, and disaster risk reduction. Future adaptation action in these areas will be required to further enhance adaptive capacity in the region. Greater attention may also need to be given to priority areas that appear to be under-represented within current initiatives:

- *Human health*—a priority concern for many countries due to the potential for climate change to increase the degree of exposure to malaria, dengue fever, diarrhea and other illnesses;
- *Infrastructure*—reflecting the exposure of much of the region's roads, buildings and communities to coastal erosion and sea level rise;
- *Marine resources*—given the current and growing importance of fisheries and tourism to the region's economy; and
- *Gender considerations*—based on the existing socioeconomic gender inequalities (such as accessibility to resources and decision-making powers) and how climate change may exacerbate these inequalities.

In addition, a larger number of adaptation projects tailored to specifically meeting the needs of individual countries may be appropriate, particularly within some of the region's larger countries, such as Fiji, PNG, the Solomon Islands and Vanuatu. At present, nationally focused projects are occurring in about half of the countries in the region. This includes each of the region's LDCs, with the exception of the Solomon Islands—reflecting the fact that approximately half of the ongoing national projects are funded in part with resources from the LDCF. Pacific Island countries have expressed a desire for more nationally-focused programs going forward, in parallel with current

efforts to strengthen the technical backstopping efforts of regional agencies.[62] As countries complete national adaptation studies, plans and strategies, an increase in these types of projects may be forthcoming.

Existing action remains dominated by capacity building, research and policy development initiatives, reflective of the general low level of capacity in the Pacific region. Although these types of projects continue to be needed, an increase in "on the ground" adaptation action may be appropriate—particularly as research and assessments are completed, and greater technical and managerial capacity is built in each country

Many Pacific Island states have recognized the need to integrate climate change considerations into routine policy development and planning, as well as government and community-level programming in a diversity of sectors. As such a greater level of adaptation action is likely taking place in the Pacific than what is reflected in this review. Given the region's high degree of vulnerability to climate change, these mainstreamed actions as well as those occurring through stand-alone adaptation projects and programs will be essential to enabling the long-term sustainable development of Pacific Island states.

[62] Personal communication, representative of the Adaptation Partnership, August 2011.

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Appendices: Country Profiles

Within this review of current and planned adaptation action, the Pacific Region is defined as including: Cook Islands, Federated States of Micronesia, Fiji, Kiribati, Marshall Islands, Nauru, Niue, Palau, Papua New Guinea, Samoa, Solomon Islands, Tonga, Tuvalu and Vanuatu.

To assess the level of adaptation action occurring in each of these countries, a desk-based review of internet sources and relevant documentation was undertaken. The content of these sources was assessed in relation to a set of parameters established to focus the review's scope and ensure consistency across regions. Notably, it examines *discrete* adaptation actions, or *policies, programs and projects designed and implemented specifically to address the current and projected impacts of climate change*. Therefore, the review presents only a portion of the breadth of the efforts underway to reduce the vulnerability of developing countries to the impacts of climate change. In particular, it does not capture the broad array of development activities that are increasing the adaptive capacity of communities and countries. As well, within the review, adaptation efforts have been deemed to be "current" if they were ongoing or completed in 2009 or later. Therefore, the review does not include projects completed prior to 2009 that may have contributed to building local and national capacity to adapt. The review also only identifies those actions currently underway; it does not offer judgment of the effectiveness of actions taking place. In addition, reflecting the desk-based nature of the review, it is acknowledged that the content is biased toward identification of large-scale projects funded by international development assistance organizations and those projects about which information is available online. Therefore, small-scale projects that meet the review's definition of adaptation action, particularly those occurring at the community level, are not fully represented within the review. A fuller explanation of the methodology used to develop the country profiles that follow is provided in the methodology section of this report.

To facilitate analysis of the degree to which current adaptation projects and programs identified through the review are helping to meet the adaptation needs and priorities of developing countries, a common classification system was developed. This system examined identified projects and programs from two perspectives—their sector or areas of focus and the types of activities they are supporting. A fuller description of these two types of classifications is provided below.

Sector or Area of Focus

To support development of a general classification system for adaptation projects on the basis of their sector or area of focus, a review of the categories used by the Adaptation Learning Mechanism, Intergovernmental Panel on Climate Change (IPCC), United Nations

Environment Programme (UNEP) and the Nairobi Work Programme was completed and used to guide development of a series of categories for characterizing activities included in this review. Based on this review and expert judgment, a set of 14 macro project categories were identified: food, fiber and forests; ecosystems; freshwater resources; oceans and coastal areas; disaster risk management; migration and security; gender; business; infrastructure and transportation; human settlements; human health; climate information services; governance; and multi-sectoral. Where appropriate, these macro project categories were further refined through the identification of various sub-categories. These sub-categories were then used to label the discrete adaptation projects included in the review.

Definitions of the macro project categories used in the review along with descriptions of the types of projects included within their individual sub-categories are presented below.

1. **Food, Fiber and Forests** – Defined as the management and use of terrestrial natural resources to directly improve human well-being. Its sub-categories are:
   - *Agriculture* – Encompassing subsistence agriculture, commercial agriculture and the rearing of confined domestic animals.
   - *Pastoralism* – Encompassing the use of domestic animals as a primary means for obtaining resources from habitats (UNEP, 2007), particularly in nomadic and semi-nomadic communities.
   - *Forestry* – Encompassing afforestation, reforestation, agroforestry, commercial forestry, community-based forest management and woodland management.
   - *Fire management* – encompassing monitoring, planning and management to address the impact of fires on settlements and ecosystems, including forested and grassland ecosystems.

2. **Ecosystems** – Defined as a system of living organisms interacting together and with their physical environment, the boundaries of which may range from very small spatial scales to, ultimately, the entire Earth (IPCC, 2007). Its sub-categories are:
   - *Biodiversity* – Encompassing activities related to the maintenance of living organisms at various spatial scales, including the establishment and protection of parks and bio-reserves.
   - *Ecosystem conservation* – Encompassing efforts to *maintain* the health of particular ecosystems, such as wetlands, grasslands, forests, mangroves and coral reefs.
   - *Ecosystem restoration* – Encompassing efforts to *restore* the health of particular ecosystems, such as wetlands, grasslands, forests, mangroves and coral reefs.

3. **Freshwater Resources** – Defined as the management and use of freshwater contained in terrestrial ponds, lakes, rivers, watersheds, among others. Its sub-categories are:
   - *Freshwater fisheries* – Encompasses the catching, packing and selling of fish and shellfish derived from lakes, rivers and ponds, as well as through freshwater aquaculture.
   - *Watershed management* – Encompassing management of the basins that supply water to different streams, rivers, lakes and reservoirs, including integrated watershed management.
   - *Freshwater supply* – Encompassing efforts to access and preserve freshwater for human consumption and use including drinking water sources, groundwater resources, rainwater harvesting and water infrastructure such as wells, dams and dikes.

4. **Oceans and Coastal Areas** – Defined as the management and use of coastal areas and oceans. Its sub-categories are:
   - *Coastal zone management* – Encompassing the management of land and water resources in coastal areas, including through integrated coastal zone management and the establishment and maintenance of coastal infrastructure.
   - *Marine management* – Encompassing the management and use of off-shore ocean and sea resources.
   - *Marine fisheries* – Encompassing the catching, packing and selling of fish, shellfish and other aquatic resources found in the oceans and seas, including through marine and coastal aquaculture.

5. **Disaster Risk Management** – Defined as the "systematic process of using administrative directives, organizations, and operational skills and capacities to implement strategies, policies and improved coping capacities in order to lessen the adverse impacts of hazards and the possibility of disaster" (UNISDR, 2009, pp. 10). It includes emergency response measures, preparation for extreme events and early warning systems. No sub-categories were established in relation to this macro project category.

6. **Migration and Security** – Defined as efforts to support the movement of people and maintain their personal security in the face of incremental climate changes or climate shocks.
   - *Migration* – Encompassing preparations for and responses to the potential movement of people from one location to another due to climate change impacts.
   - *Security* – Relates to personal security and freedom from violence, crime and war due to natural and human-induced disasters (UNEP, 2007) and encompasses peace building, conflict reduction and conflict avoidance activities.

7. **Gender** – Defined as the social attributes and opportunities associated with being male and female and the relationships between women and men, and girls and boys, as well as the relations between women and those between men. These attributes, opportunities and relationships are socially constructed and are learned through socialization processes (UN Women, undated). It includes efforts to understand the vulnerability of women to the impacts of climate change, gender-sensitive adaptation strategies, and measures to improve the situation of women at the local and policy level, including through gender mainstreaming. No sub-categories were established in relation to this macro project category.

8. **Business** – Defined as the purchase and sale of goods and services with the objective of earning a profit. Its sub-categories are:
   - *Tourism* – Encompassing the adjustment and development of tourist facilities and operations to account for current and future vulnerabilities, including these actions in relation to ecotourism.
   - *Private sector* – Encompassing potential impact of climate change and potential adaptation strategies on the diverse activities underway in the portion of the economy in which goods and services are produced by individuals and companies including industry, mining and other economic sectors.
   - *Trade* – Encompassing the exchange of goods and services within and between countries.
   - *Insurance* – Encompassing the development, testing and adjusting of insurance and risk-management schemes, including weather-based index systems.

9. **Infrastructure** – Defined as the basic equipment, utilities, productive enterprises, installations, institutions and services essential for the development, operation and growth of an organization, city or nation (IPCC, 2001). Its sub-categories are:
   - *Energy* – Encompassing energy-related systems and infrastructure, including small-scale and large-scale energy generation through hydroelectric power generation, wind, solar and other forms of traditional and new energy sources, as well as transmission networks.
   - *Transportation* – Encompassing the components of the system required to move people and goods, including roads, bridges, railway lines, shipping corridors and ports.
   - *Waste management* – Encompassing sanitation, sewage systems, drainage systems and landfills.
   - *Buildings* – Encompassing actions related to built structures such as houses, schools and offices, including changes to building codes, building practices and green ways of construction.

10. **Human Settlements** – Defined as a place or area occupied by settlers (IPCC, 2001). Its sub-categories are:
    - *Peri-urban areas* – Encompassing the outskirts of urban centers, and the transition zone between rural and urban areas.
    - *Urban areas* – Encompassing municipalities, towns and cities, as well as areas in these centers (such as slums).
    - Rural areas – Encompassing villages and other small settlements, as well as rural landscapes and integrated rural development.

11. **Human Health** – Defined as a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity (WHO, undated). It includes efforts to assess vulnerabilities to and the impacts of climate change on human health directly and indirectly, and the development and implementation of appropriate adaptation strategies at the local, regional and national levels. No sub-categories were established in relation to this macro project category.

12. **Climate Information Services** – Defined as the production and delivery of authoritative, timely and usable information about climate change, climate variability, climate trends and impacts to different users at the local, sub-national, national, regional and global levels.[63] It includes efforts to develop, adjust and provide short- and long-term climate forecasts, including climate change projections, to different audiences. No sub-categories were established in relation to this macro project category.

13. **Governance** – Defined as the institutions (laws, property rights systems and forms of social organization) through which societies define and exercise control over resources.[64] Its sub-categories are:
    - *Government* – Encompassing efforts to build the capacity of government officials, either at the national or sub-national level, to prepare for and facilitate adaptation to climate change, including through the development of policies, plans, frameworks and strategies, as well as the establishment and operation of climate change trust funds.
    - *Civil society* – Encompassing efforts to build the capacity of the public including non-governmental organizations, to understand, prepare for and respond to climate change.

14. **Multi-sectoral** – Defined as actions that simultaneously address more than one sector in one and/or multiple locations. It includes efforts that address more than one sector, which are challenging to tease apart, and in the context of this review includes large, multi-country projects in which the specific sector of focus is nationally determined and, therefore, varies from country to country. No sub-categories were established in relation to this macro project category.

[63] Derived from: http://www.joss.ucar.edu/cscc/climate-service-definition-condensed.pdf
[64] Derived from UNEP, 2007.

Types of Activities

The following categories were used to organize the types of activities being completed as part of current adaptation projects and programs identified through the review:

- *Research* – Encompassing efforts to develop new knowledge and/or organize existing information so as to increase understanding of the links between climate change, human society and ecosystems and inform adaptation decision-making.
- *Assessment* – Encompassing risk, impact and vulnerability assessments, as well as monitoring of ecological and societal trends.
- *Capacity building* – Encompassing the provision of technical training, technical assistance, institutional strengthening and education.
- *Knowledge communication* – Encompassing efforts to share information, knowledge and practices related to climate change adaptation, including awareness raising and engagement of media.
- *Policy formation and integration* – Encompassing efforts to inform, develop and implement climate change adaptation plans, strategies, frameworks and policies at the local, sub-national, national and international levels.
- *Field implementation* – Encompassing physical measures to reduce vulnerability to the impacts of climate change, including the implementation of pilot projects, construction of infrastructure, development and modification of technologies and the management of physical resources.
- Community-based adaptation – Encompassing actions that directly engage community members in efforts to understand, plan for and respond to the impacts of climate change.

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1.0 Cook Islands

ADB	Asian Development Bank
AusAID	Australia Agency for International Development
CIES	Cook Island Environmental Service
DFID	United Kingdom Department for International Development
GEF	Global Environment Facility
GNZ	Government of New Zealand
PACC	Pacific Islands Adaptation to Climate Change Project
PNG	Papua New Guinea
SCCF	Special Climate Change Fund
SPREP	South Pacific Regional Environment Program

The Cook Islands are a chain of 15 small islands off the northeast coast of New Zealand. The islands collectively have a land area of approximately 240 square kilometers, but its Exclusive Economic Zone covers approximately 1.8 million square kilometers of the Pacific Ocean. The population is primarily gathered on the island of Rarotonga. Tourism is by far the country's main industry, with other industries including pearls, offshore banking and the export of marine and fruit products. The people of Cook Islands are citizens of New Zealand, but have a separate status as Cook Island nationals (GNZ, 2010).

A. Adaptation Needs and Priorities

As climate change progresses, the Cook Islands are anticipated to be at greater risk due to sea level rise, extreme rainfall events, storm surges, strong winds and extreme high air temperatures (ADB, 2005). These changes are expected to adversely affect the following priority sectors: coastal and coral reefs; agriculture, food security and diet; marine resources; water resources; and biodiversity. To enhance capacity to address the impacts of climate change, the following priority actions have been identified by the Cook Islands (CIES, 1999):

- Gain more information about flora, fauna and how their interactions are and will change.
- Understand circulation processes within lagoons and the influence of climate to assist in the understanding of pearl and mariculture production, shallow lagoons, lagoon flushing and lagoon temperature change.

- Gain knowledge on the interactions between marine flora and fauna and the effects of external influences on these species and their interactions, such as: pelagic fisheries migration and recruitment; gene bank of marine flora/fauna; and model low diversity marine ecosystems.
- Understanding of ecosystem rejuvenation after implementation of traditional conservation management practices (e.g. Ra'ui Island).
- Identify specific integrated effects affecting marine resources, such as coastal sedimentation from rainfall runoff through Avatiu Harbour.
- Capacity building in areas like: local physical oceanography expertise; systems/ecosystem approach; environmental ocean modeling of tuna and other pelagic stocks; training and equipment required; and an improvement in the biological species database.

B. National Level Policies and Strategic Documents

The Cook Islands released their Initial National Communication to the United Nations Framework Convention on Climate Change in 1999. It outlines the socioeconomic and environmental status of the islands and identifies its main vulnerabilities to the impacts of climate change. Measures to reduce vulnerability to these impacts are briefly outlined in this document (CIES, 1999). Building on information gathered through this process, the Cook Islands worked in 2003 to integrate climate change adaptation into its National Sustainable Development Strategy. Sectoral reviews were undertaken and National Guidelines for Mainstreaming Adaptation to Climate Change were prepared and adopted by Cabinet (ADB, 2005).

Table 1: Key Government Policies and Reports reflecting Adaptation Needs, Priorities and Planned Actions

Name of Policy Action		Government Division Responsible	Status	Sector(s) of Focus	Summary description
1.	Initial National Communication of the Cook Islands under the United National Framework Convention on Climate Change[65]	Cook Island Environmental Service	Released October 1999	Agriculture; Marine management; Tourism	The national circumstances are briefly outlined in terms of most aspects of the economy and natural resources. The greenhouse gas inventory concludes that there is little global contribution, but a reduction in fossil fuel dependence is still important. The vulnerabilities are outlined; main vulnerabilities in the island are the coastal zone, coral reefs, agriculture sector, marine and water resources and

[65] UNFCCC, http://unfccc.int/essential_background/library/items/3599.php?rec=j&priref=2432#beg

Name of Policy Action		Government Division Responsible	Status	Sector(s) of Focus	Summary description
					biodiversity. Several adaptation measures are outlined, along with cross sectorial measure that can be taken to adapt to climate change.
2.	National Sustainable Development Strategy 2006 - 2010[66]	Government of the Cook Islands		Multi-sectoral	Sets forth nine goals to be achieve as the Cook Islands works to promote its development objectives. Acknowledges the risks posed by climate change and seeks to reduce vulnerability to natural hazards.

C. Current Adaptation Action

Current adaptation action in the Cook Islands tends toward capacity building and focuses on sectors such as agriculture, water, risk reduction and strengthening meteorological systems. The country is predominantly involved in regional projects; few projects focus exclusively on the Cook Islands or are implemented by the island government itself.

Table 2: Current Adaptation Projects and Programs active in the Cook Islands

Name		Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
National Action								
1.	Protecting Island Biodiversity and Traditional Culture in Pacific Island Communities Through Community-based Climate Risk Assessment and Management: Development of adaptation strategies and community-based risk management tools for four vulnerable communities and	The project will incorporate community-based impact and adaptation strategies within four vulnerable communities on Aitutaki and Rarotonga in the Cook Islands. The project will develop replicable community-based adaptation risk management tools to minimize risks on critical infrastructure and service sectors, and help climate-proof vulnerable community investments	ADB Small Grants Activity	WWF-Cooks Islands	Community based adaptation	?–2010 *(completed)*	Coastal zone management	Aitutaki and Rarotonga

[66] Cook Islands, http://www.cbd.int/iyb/doc/celebrations/iyb-CookIslands-NSDP2006-2010.pdf

Name		Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
	related infrastructure in the Cook Islands[67]							
Participation in Regional and Global Actions								
2.	Pacific Islands Climate Prediction Project[68]	The project aimed to expand understanding of how seasonal climate prediction services can be applied to support climate-sensitive decision making and the use of climate predictions by National Meteorological Services and industries/agencies which use climate information (e.g. farmers, tourism, water resource managers and health authorities). Along with the provision of software tailored to local circumstances and training in the effective use of climate predictions in a risk management context, the project undertook specific pilot activities.	AusAID *Budget:* AU$3.0 million	Australia Bureau of Meteorology	Research; Capacity building	Phase I: 2004–2006 Phase II: 2007–2009 (*completed*)	Climate information services	*Regional:* Cook Islands, Fiji, Kiribati, Niue, PNG, Samoa, Solomon Islands, Tonga, Tuvalu, Vanuatu
			In Cook Islands: Completed climate forecasts with an emphasis on rainfall and cyclone prediction. Participated in the pilot project "Climate and Oceanographic Variability and their Impacts on Fisheries"[69] and completed workshop entitled "Climate and Fisheries— Guide to Managing Risks and Taking Opportunities." Participated in the pilot project "Application of Climate Forecasting in Water Management."[70]					
3.	Preparedness for Climate Change[71]	The aim of this program was for the Red Cross and Red Crescent National Societies in countries particularly vulnerable to climate change to gain a better understanding of climate change and its impacts to identify country-specific adaptation measures in line with risks. Activities could include organizing	Red Cross/Red Crescent Climate Centre	National Red Cross/Red Crescent Societies	Capacity building; Policy formation and integration	Phase 1: 2006–2009 Phase 2: ongoing	Disaster risk management;	*Global:* 39 countries *Pacific participants in Phase 1:* Cook

[67] ADB, http://www.adb.org/documents/reports/climate-change-pac/Climate-Change-pac.pdf and http://www.iapad.org/publications/ppgis/reta_6420.pdf
[68] BOM, http://www.bom.gov.au/climate/pi-cpp/ and ALM, http://www.adaptationlearning.net/project/pacific-islands-climate-predictions-project-pi-cpp
[69] BOM, http://www.bom.gov.au/climate/pi-cpp/pilot_projects/fisheries_guide.shtml
[70] BOM http://www.bom.gov.au/climate/pi-cpp/pilot_projects/water_mgt.shtml
[71] IFRC, http://www.climatecentre.org/site/preparedness-for-climate-change-programme

Name		Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
		a workshop on risks, assessment of risks through preparation of a background document, capacity building programs, and developing climate change resilient plans.						Islands, Kiribati, Solomon Islands, Tonga
			In Cook Islands: By the conclusion of the first phase of the project, the Red Cross was developing climate change resilient plans and programs.[72]					
4.	Regional Partnerships for Climate Change Adaptation and Disaster Preparedness[73]	The outcome is expected to be a strengthened information system that will support informed decision-making aimed at minimizing the negative social and environmental impacts of catastrophic events. It will also mitigate the financial risk of participating Pacific developing member countries to the effects of natural disasters, including those exacerbated by human-induced climate change. This work is linked to the World Bank's work on the development of a Caribbean Catastrophe Insurance Facility for the Pacific.	ADB *Budget:* US$1.0 million	World Bank	Capacity building	Phase 1: 2007–2011	Disaster risk management	*Regional:* Cook Islands, Fiji, PNG, Samoa, Solomon Islands, Tonga, Tuvalu, and Vanuatu
			In Cook Islands: In the first phase of the project, data will be gathered for catastrophe risk models in each country, and country-specific loss risk profiles will be created in order to assess the feasibility of catastrophic risk financing and insurance options.[74]					
5.	Pacific Islands Adaptation to Climate Change Project (PACC)[75]	PACC will implement long-term adaptation measures to increase the resilience of a number of key development sectors in the Pacific Islands to the impacts of climate change. This objective will be achieved by focusing on adaptation response strategies, policies and measures to bring about this	SCCF, co-financing *Budget:* US$59,526,299	UNDP, ADB, SPREP	Capacity building; Policy formation and integration	2008–2012	Agriculture; Coastal zone management; Freshwater supply	*Regional:* Cook Islands, FSM, Fiji, Marshall Islands, Nauru,

[72] IFRC, http://www.climatecentre.org/downloads/File/programs/Final%20PFCC%20General%20Assembly%20Document%20with%20renewed%20table.pdf
[73] ADB, http://www.adb.org/Projects/project.asp?id=41187
[74] ADB, http://pid.adb.org/pid/TaView.htm?projNo=43071&seqNo=01&typeCd=2#timetable
[75] GEF, http://www.thegef.org/gef/sites/thegef.org/files/documents/document/09-16-08-SCCF.pdf

Name		Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
		result. The key development sectors this project will focus on are: 1. water resources management; 2. food production and food security; and 3. coastal zone and associated infrastructure (roads and breakwater). To ensure sustainability of the project, regional and national adaptation financing instruments will constitute a fourth component of the project.						Niue, Palau, Papua New Guinea, Samoa, Solomon Islands, Tonga, Tuvalu, Vanuatu
			In the Cook Islands: Demonstrate measures to reduce vulnerability in coastal areas; implement policy changes to deliver immediate vulnerability reduction benefits in context of emerging climate risks; improve capacity to plan for and respond to changes in climate-related risks; establish guidelines for integrating coastal climate risks into an integrated coastal management program; demonstrate risk reduction practices in Manihiki communities; and provide additional support to the Government of the Cook Islands to put in place measures that reduce the effect of climate risks (e.g. storm surges) when redeveloping the Manihiki Airport. • *Lead Implementing Agency:* Aid Management Division in collaboration with the National Environment Service					
6.	Strengthening the Capacity of Pacific Developing Member Countries to Respond to Climate Change (Phase 1)[76]	Incorporation of climate risk management, adaptation practices, and greenhouse gas mitigation measures into infrastructure and key sector investment plans and project designs. Adaptation related actions include: • Pacific Climate Change Program—will assist participating countries to improve their resilience to climate change impacts through (i) mainstreaming of the adaptation in their policies, plans,	ADB, Canada *Budget:* US$4.965 million	ADB	Capacity building; Policy formation and integration	2009–?	Government	*Regional:* Cook Islands, FSM, Fiji, Kiribati, Marshall Islands, Nauru, Palau, PNG, Samoa, Solomon

[76] ADB, http://pid.adb.org/pid/TaView.htm?projNo=43071&seqNo=01&typeCd=2#timetable

Name		Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
		programs, and projects; and (ii) strengthening their systems and capabilities to foster the adaptation process; and • Adaptation preparation—up to five countries will be supported in preparing the implementation of climate change adaptation plans, including further capacity building.						Islands, Tonga, Tuvalu, Vanuatu. *Plus:* Timor-Leste
			In Cook Islands: Additional information required.					

D. Proposed Adaptation Action

The Cook Islands has submitted project proposals to both the Special Climate Change Fund (SCCF) and the Adaptation Fund for consideration. As summarized in Table 3, these projects are to focus on building the resilience of the islands' infrastructure and its communities.

Table 3: Proposed Adaptation Projects and Programs in the Cook Islands

Name		Objectives	Type of project	Priority Sector(s)	Geographic focus (if any)
1.	Cook Islands Infrastructure Development Project (Phase 2) - Increasing Climate Resilience of Island Infrastructure[77]	Promote environmentally sound development of infrastructure for power, water supply, sanitation, solid waste, and transport in support of the Government's pro-poor objectives.	Capacity building	Energy; Transportation; Freshwater supply	Cook Islands
			Notes: Proposed to the SCCF = $5,000,000; Proposed co-fin = $16,100,000 (ADB agency)		
2.	Enhancing Resilience of Communities of Cook Islands through Integrated Climate Change Adaptation and Disaster Risk Management Measures[78]	Vulnerability assessment, development of community based adaptive management plans and institutional strengthening.	Capacity building	Multi-sectoral	South Pacific Convergence Zone (Cook Islands)
			Notes: Concept note approved by the Adaptation Fund Board at its meeting on December 15, 2010. *Planned Implementing Agency:* UNDP		

[78] Further information available here: http://www.adaptation-fund.org/sites/default/files/AF%20Cook%20Islands%20Concept-24OCT.pdf and http://www.thegef.org/gef/sites/thegef.org/files/publication/adaptation-actions_0.pdf

Name	Objectives	Type of project	Priority Sector(s)	Geographic focus (if any)
		Proposed budget: US$4,991,000		

E. Assessment

The Cook Islands are making moderate progress addressing climate change adaptation, primarily through participation in regional projects. The country may benefit from preparing a national climate change strategy in order to more systematically identify key vulnerabilities and to prioritize adaptation actions going forward. Adaptation activities within the areas of coastal zones, agriculture, water, fisheries, and other priority areas for the Cook Islands could be expanded. Moreover, gender considerations are not part of any current adaptation project or proposed strategy; these could be integrated into current and future proposals as appropriate.

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2.0 Federated States of Micronesia

ADB	Asian Development Bank
FSM	Federated States of Micronesia
GEF	Global Environment Facility
NGO	Non-Governmental Organization
PACC	Pacific Islands Adaptation to Climate Change Project
SCCF	Special Climate Change Fund
SPA	Strategic Priority for Adaptation (Global Environment Facility)
SPREP	Secretariat to Pacific Regional Environmental Program
UNDP	United Nations Development Programme

The Federated States of Micronesia (FSM) is a group of 607 islands with a population of approximately 106,000 people in the Western Pacific Ocean located approximately 2,900 kilometers north of eastern Australia. The mainstays of the Micronesian economy are subsistence farming and fishing; the country also possesses high-grade deposits of phosphate (CIA, 2011). There is little tourism in the area due to lack of access and facilities. These characteristics of geographical isolation and poorly developed infrastructure in general are major impediments to FSM's long-term growth.

A. Adaptation Needs and Priorities

The FSM completed its First National Communication to the United Nations Framework Convention on Climate Change (UNFCCC) in 1999. Within this document, FSM noted that its main, short-term concern related to climate change as being the possibility of an increase in the frequency, duration and intensity of El Niño droughts, and the need to enhance capacity to address El Niño and La Niña events. Accelerated sea level rise was identified as a concern over the longer-term. Sectors of concern were noted as being coral reef ecosystems, coastal zones, waste management, upland forests, agriculture and water supply The adaptation needs of the FSM as identified in its First National Communication (FSM, 1999) were:

- Reforestation of mangroves, upland forests and other forests in need of restoration.
- Development of a community based coral-reef protection program.
- Public awareness programs related to fire danger (related to drought events) and climate change, supported through the training of government employees and development of sustainable development educational materials.

- Research programs that will document Micronesian traditional environmental knowledge, complete vulnerability and needs assessment, and design of an evaluation tool for new programs.
- Technology development and transfer, including: implementation of Micronesian traditional environmental management knowledge programs; and networking with various NGO's to develop a program for identifying, transferring and modifying appropriate technologies for use in the implementation of sectoral climate change adaptation measures.
- Interagency strengthening, including restructuring of the sustainable development council into four working groups: 1) management and protection of natural resources; 2) improvement of waste management and pollution control; 3) improvement of environmental awareness and education; and 4) integration of environmental consideration in economic development.

The implementation of these and other adaptation actions in FSM are likely to be challenging due to: the remoteness of the country and its population; the absence of abundant resources; data gaps; traditional land use, decision-making and tenure systems; and the absence of sufficient planning and funding (Fletcher and Richmond, 2010).

B. National Level Policies and Strategic Documents

There are several documents released by the FSM government related to climate change adaptation. These include:

- The *First Climate Change National Communication* to the UNFCCC, which outlined the priority sectors that would feel the impacts of climate change and projections of how they would be affected. The most significant impacts were expected to be from sea level rise and droughts (FSM, 1999).
- The Nationwide Climate Change Policy (2009) includes a commitment to addressing climate change adaptation through a framework in which: "all development activities in FSM to take into account projected climatic changes in the design and implementation as stipulated in the FSM Strategic Development Plan/Infrastructure Development Plan." It also calls for: the use of an ecosystem-based approach where applicable; strengthening the application of traditional knowledge on conservation practices; and the development and implementation of appropriate strategies to improve food production and other relevant sectors. The Policy also calls for the integration of climate change into other policies and strategies, including those related to disaster preparedness (FSM, 2009: 2).
- The U.S. Forest Service and the FSM collaborated on a forest management plan, *Federated States of Micronesia State-Wide Assessment and Resource Strategy 2010–2015+* (2010), that is a strategic plan to harvest timber and manage forest resources in a way that preserves the soils and resource. The plan integrates climate adaptation considerations (FSM and U.S. Forest Service, 2010).

Table 1: Key Government Policies and Reports reflecting Adaptation Needs, Priorities and Planned Actions

Name of Policy Action		Government Division Responsible	Status	Sector(s) of Focus	Summary description
1.	Climate Change National Communication[79]	FSM National Government	Released 1997	Multi-sectoral	This report identifies the major concerns for FSM; La Niña/El Niño events, sea level rise and greenhouse gas emissions were at the top of the priorities. It also identified a number of focus sectors and the ways in which they are vulnerable, as well as outlines several adaptation measures.
2.	Nationwide Climate Change Policy 2009[80]	FSM National Government	Released 2009	Multi-sectoral	This national policy document outlines the climate change policy, goals and strategies for the FSM, giving attention to adaptation, technology transfer, financing, capacity building and training, education and public awareness, implementation and support.
3.	Federated States of Micronesia State-Wide Assessment and Resource Strategy 2010–2015+[81]	FSM National Government, U.S. Forest Service	Released 2010	Agroforestry; Forestry; Freshwater supply	This document outlines the forest stewardship needs, forest resources and management strategies for all of the states of Micronesia. This document has a focus on climate change adaptation and mitigation for all of the states.

C. Current Adaptation Action

The Federated States of Micronesia appear to be participating in a low number of regional climate change adaptation projects relative to other Pacific countries; no nationally focused projects were identified. The focus areas of these projects are coastal zone management, agriculture, water and conservation. The funders identified as being active in Micronesia are: the Asia Development Bank (ADB); the Global Environment Facility (GEF), the Special Climate Change Fund (SCCF), and the governments of Australia, Canada, Germany, Japan and the United States.

[79]Climate Change National Communication: http://unfccc.int/essential_background/library/items/3599.php?rec=j&priref=358#beg
[80] Nationwide Climate Change Policy 2009: http://www.fsmpio.fm/Nationwide_Climate_Change_policy.pdf
[81]Federated States of Micronesia State-Wide Assessment and Resource Strategy 2010–2015+: http://www.islandforestry.org/pdf/2010/federated-states-of-micronesia.pdf

Table 2: Current Adaptation Projects and Programs active in the Federated States of Micronesia

Name		Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
Participation in Regional and Global Actions								
1.	Pacific Islands Adaptation to Climate Change Project (PACC)[82]	PACC will implement long-term adaptation measures to increase the resilience of a number of key development sectors in the Pacific Islands to the impacts of climate change. This objective will be achieved by focusing on adaptation response strategies, policies and measures to bring about this result. The key development sectors this project will focus on are: 1. water resources management; 2. food production and food security; and 3. coastal zone and associated infrastructure (roads and breakwater). To ensure sustainability of the project, regional and national adaptation financing instruments will constitute a fourth component of the project.	SCCF, co-financing *Budget:* US$59,526,299	UNDP, ADB, SPREP	Capacity building; Policy formation and integration	2008–2012	Agriculture; Coastal zone management; Freshwater supply	*Regional:* Cook Islands, FSM, Fiji, Nauru, Palau, PNG, Solomon Islands, Tonga, Tuvalu, Vanuatu
			In Federated States of Micronesia: Measures for guidelines on climate risks into coastal management strategies in the state of Kosrae coastal road system.					
2.	Coastal and Marine Resources Management in the Coral Triangle of the Pacific (under the Pacific Alliance for Sustainability Program and the Coral Triangle Initiative)[83]	To promote the conservation and sustainable use of globally significant coastal and marine resources in the Coral Triangle region through the introduction of integrated and ecosystem-based coastal and marine resources management in five Pacific countries. Includes the implementation of pilot adaptation measures to enhance resilience and increase capacity to respond to the adverse impacts of climate change on coastal and marine ecosystems.	GEF-SPA; Japan; Australia; United States *Budget:* US$27,568,183	ADB	Capacity building, Research; Field implementation	2008–2013	Coastal zone management; Marine management	*Regional:* FSM, Fiji, Palau, PNG, Solomon Islands and Vanuatu *Plus:* Timor-Leste
			In Federated States of Micronesia: Further information required.					
3.	Strengthening the Capacity	Incorporation of climate risk management,	ADB, Canada	ADB	Capacity	2009–?	Government	*Regional:*

[82]GEF, http://www.thegef.org/gef/sites/thegef.org/files/documents/document/09-16-08-SCCF.pdf
[83] GEF, http://www.gefonline.org/projectDetailsSQL.cfm?projID=3591

Name		Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
	of Pacific Developing Member Countries to Respond to Climate Change (Phase 1)[84]	adaptation practices, and greenhouse gas mitigation measures into infrastructure and key sector investment plans and project designs. Adaptation related actions include: • Pacific Climate Change Program–will assist participating countries to improve their resilience to climate change impacts through (i) mainstreaming of the adaptation in their policies, plans, programs, and projects; and (ii) strengthening their systems and capabilities to foster the adaptation process; and • Adaptation preparation–up to five countries will be supported in preparing the implementation of climate change adaptation plans, including further capacity building	*Budget:* US$4.965 million		building; Policy formation and integration			Cook Islands, Fiji, FSM, Kiribati, Marshall Islands, Nauru, Palau, PNG, Samoa, Solomon Islands, Tonga, Tuvalu, Vanuatu. *Plus:* Timor-Leste
			In Federated States of Micronesia: further information required.					
4.	Coping with Climate Change in the Pacific Island Region[85]	Enhance the competence and capabilities of the local population, the national governmental authorities and regional organizations—SPC and SPREP—in order to cope with the effects of climate change and combat its causes. It includes reviewing policies and integrating adaptation considerations into them, and focuses on the management of land and coastal natural resources, as well as tourism. At the regional level, the program aligns with the Pacific Island Framework for Action on Climate	German Federal Ministry for Economic Cooperation and Development *Budget:* €17.2 million	GIZ, SPC	Capacity building; Policy formation and integration; Field implementation	2009–2015	Agriculture; Forestry; Tourism	*Regional:* FSM, Fiji, Kiribati, Marshall Islands, Nauru, Palau, PNG, Samoa, Solomon Islands, Tonga, Tuvalu, Vanuatu

[84] ADB, http://pid.adb.org/pid/TaView.htm?projNo=43071&seqNo=01&typeCd=2#timetable
[85] GIZ, http://www.gtz.de/en/weltweit/asien-pazifik/27718.htm and SPC, http://www.spc.int/lrd/index.php?option=com_content&view=article&id=478&Itemid=44

Name		Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
		Change 2006–2015. Originally only involving Fiji, Tonga, Vanuatu, the project has been expanded and extended.	*In Federated States of Micronesia:* further information required.					
5.	Asia Pacific Climate Change Adaptation Project Preparation Facility (ADAPT)[86]	Increase access to financial resources for climate change adaptation investment projects; strengthen national human and institutional capacity in preparation of financing proposals; and strengthen regional knowledge platform to share information and processes on climate change projects, funds and best practices to promote replication and scaling up.	USAID *Budget:* US$18.0 million	WWF, Conservation International, the Nature Conservancy, ARD Inc., NOAA	Capacity building; Knowledge communication	2011–2016	Government	*Asia Region:* Bangladesh Cambodia FSM, Fiji, Indonesia, Lao PDR, Malaysia, Nepal, Palau, Philippines, Solomon Islands, Sri Lanka, Thailand, Viet Nam
			In Federated States of Micronesia: further information required.					

D. Proposed Adaptation Action

No proposed adaptation actions have been identified for Micronesia.

E. Assessment

Although the Federated States of Micronesia is presently engaged in a low number of adaptation projects, it appears to have made progress with respect to promoting the integration of adaptation into national policies. This commitment is reflected in FSM's Nationwide Climate Change Policy. The degree to which this commitment has been translated into the implementation of ongoing efforts is unclear. The content of the FSM's Climate Change Policy also suggests a need for greater attention to be given to vulnerability reduction related to agriculture and disaster risk reduction. It has also been suggested that a national strategy for managing climate risk based on public education and community decision making would help increase food and water security (Fletcher and Richmond, 2010).

[86] USDS, http://www.state.gov/documents/organization/151686.pdf

Other sectors that may desire greater attention are forestry, health and gender considerations, all of which are not the primary focus of any identified, current adaptation projects.

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3.0 Fiji

ADB	Asian Development Bank
AusAID	Australian Agency for International Development
GEF	Global Environment Facility
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit (Germany)
GRFI	Government of the Republic of the Fiji Islands
IFRC	International Federation of Red Cross and Red Crescent
IUCN	International Union for the Conservation of Nature
MFNP	Ministry of Finance and National Planning
PACC	Pacific Islands Adaptation to Climate Change Project
PNG	Papua New Guinea
SCCF	Special Climate Change Fund
SPA	Strategic Priority for Adaptation (Global Environment Facility)
SPREP	Secretariat to Pacific Regional Environmental Program
UNDP	United Nations Development Programme
WHO	World Health Organisation
WWF	World Wildlife Fund

Located approximately 1,100 miles off of the northeast of New Zealand's north island, the Republic of Fiji is composed of over 330 islands—the majority of which were formed through volcanic activity. Fiji is one of the most economically developed countries in the Pacific Island realm due to an abundance of forest, mineral and marine resources. Its main industries are tourism and sugar exports (GRFI, 2009). Climate change is expected to affect the country's coastal resources by way of raising temperatures in the marine environment and through sea level rise. As well there may be impacts on infrastructure caused by a potential increase in the frequency and intensity of cyclones and other tropical storms (MFNP, 2005).

A. Adaptation Needs and Priorities

Fiji has identified four main sectors in which adaptation strategies need to be assessed, planned and carried out (MFNP, 2005):

1. *Coastal resources.* Adaptation needs are identified as being:
   - An improved understanding of the coastal system, examination and evaluation of coastal protection options;
   - Land use policies that encourage settlement away from low-lying coastal areas;
   - Mangrove and reef protection, including exploration of the use of artificial reefs to enhance coastal protection; alternative sources of construction aggregate (*not* coral); reducing use and cutting of mangrove areas; and mangrove rehabilitation;
   - Controls on pollution from residential, tourism, commercial and industrial areas; and
   - Water-catchment management and soil-conservation measures to reduce erosion and sedimentation.

2. *Freshwater Resources.* Needs in this sector have been identified as including:
   - Flood Control–Construction of diversion channels, weirs, cut-off channels, retarding basins and dams; and river-improvement activities such as channel widening, dyke construction or river-bed excavation.
   - Drought alleviation–Management of water resources; water legislation; development of alternative water resources such as groundwater and the use of roof catchments; and consumer charges for water use.
   - Catchment Management–Reforestation, land-use controls, protection of wetlands and soil conservation; reducing flood-damage potential by regulating development on flood plains and promoting flood-proof building design; community level activities to improve awareness of water conservation and emergency response; and institutional development such as the creation of catchment and water authorities would help build capacity to improve the management of water resources.

3. *Agriculture.* Adaptation needs identified include:
   - Researching flexible farming systems that are tolerant to climatic variability, development of sustainable production systems, and melding of traditional and modern systems.
   - Establishment of an Agricultural Diversification Scheme (under the Commodity Development Framework).
   - Cessation of sugarcane production of marginal sloping lands and coastal lands, and intensified irrigation of sugar cane production on better lands.
   - Strengthening of land use planning in order to identify most suitable areas for adaptation commercial and subsistence based crops.
   - Root crop breeding program and development of improved irrigation systems.

4. *Human Health*. The needs for human health adaptation are:
    - Dengue Fever control: encourage prevention, improve quarantine, epidemic preparedness response and implement proper development policies.
    - Diarrheal Disease: improve reliability, safety and sanitation of water, refrigeration practices, emergency strategies and health care access.

B. National Level Policies and Strategic Documents

The Fiji Department of the Environment's *First National Communication under the Framework Convention on Climate Change*, released in 2005, outlines the climate change situation for Fiji and details adaptation measures for the country. Building on this effort, Fiji integrated climate change considerations into its Strategic Development Plan (2007–2011). This plan is an all-encompassing document that outlines the development strategy for the country in terms of environment, economy, human health, tourism, marine resources and many other areas. Climate change adaptation and mitigation is a theme found throughout the document and as its own separate discussion piece.

In 2010, the country re-established its National Climate Change Country Team, which was given responsibility for preparation of a Climate Change Policy (Fiji, n.d). Linked to this initiative are ongoing efforts to establish a National Climate Change Adaptation Strategy. It is expected that this strategy will support the integration of adaptation into core functional activities, include an action plan to address adaptation needs and be aligned with existing strategies, policies and action plans (Hay, 2011).

Table 1: Key Government Policies and Reports reflecting Adaptation Needs, Priorities and Planned Actions

Name of Policy Action		Government Division Responsible	Status	Sector(s) of Focus	Summary description
1.	Climate Change The Fiji Islands Response: Fiji's First National Communication Under the Framework Convention on Climate Change[87]	Fiji Department of the Environment	Released 2005	Agriculture; Marine management; Freshwater supply	The basics about climate change impacts and how these changes will affect base sectors is described. This report focuses on several projects: 1) establishment of a Climate Change Unit within the Department of Environment; 2) promotion of renewable energy; 3) natural vulnerability and adaptation assessment study; 4) watershed management for the sugarcane drought-prone areas; and 5) integrated coastal zone management. This detailed

[87]Climate Change The Fiji Islands Response: Fiji's First National Communication Under the Framework Convention on Climate Change: http://unfccc.int/resource/docs/natc/fjinc1.pdf

Name of Policy Action		Government Division Responsible	Status	Sector(s) of Focus	Summary description
					document introduces several mitigation techniques and strategies for reaching their goals in terms of the main projects proposed for Fiji.
2.	Strategic Development Plan[88]	Ministry of Finance and National Planning	Released November 2006	Multi-sectoral	This all-encompassing document is a strategic plan for the development of Fiji. It includes a well-developed section on environmental sustainability and climate change mitigation is a theme throughout.
3.	Climate Change Policy[89]	National Climate Change Country Team and the Ministry for Local Government, Urban Development, Housing and Environment	In development	Agriculture; Coastal zone management	Focus on climate change adaptation and mitigation.

C. Current Adaptation Action

A very high number of adaptation projects and programs are currently underway in Fiji, as demonstrated in Table 2. All of these projects engage other countries from across the Pacific and globally; no projects that solely meets Fiji's individual needs have been identified. The focus of these projects is diverse, including coastal management, water management, wetlands, agriculture, meteorology and risk reduction as well as health, fisheries, forestry and energy.

Table 2: Current Adaptation Projects and Programs active in Fiji

Name		Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
Participation in Regional and Global Actions								
1.	Pacific Islands Climate Prediction Project[90]	The project aimed to expand understanding of how seasonal climate prediction services can be applied to support climate-sensitive	AusAID *Budget:*	Australia Bureau of Meteorology	Research; Capacity building	Phase I: 2004–2006 Phase II:	Climate information services	*Regional:* Cook Islands, Fiji, Kiribati,

[88] Strategic Development Plan: http://www.fijianaffairs.gov.fj/docs/Strategic_Development_Plan_2007_to_2011.pdf
[89] Climate Change Policy: http://www.fiji.gov.fj/index.php?option=com_content&view=article&id=3476:climate-change-policy&catid=71:press-releases&Itemid=155
[90] BOM, http://www.bom.gov.au/climate/pi-cpp/ and ALM, http://www.adaptationlearning.net/project/pacific-islands-climate-predictions-project-pi-cpp

Name		Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
		decision making and the use of climate predictions by National Meteorological Services and industries/agencies which use climate information (e.g. farmers, tourism, water resource managers and health authorities). Along with the provision of software tailored to local circumstances and training in the effective use of climate predictions in a risk management context, the project undertook specific pilot activities.	AU$3.0 million			2007–2009 (*completed*)		Niue, PNG, Samoa, Solomon Islands, Tonga, Tuvalu, Vanuatu
			In Fiji: Support for Fiji's Meteorological Services and early rainfall warning system. Training workshop for area producers. Locally implemented the pilot project "Impact of Climate Variability and Climate Change on Water Security: A case study of Vaturu dam in Fiji"[91] and participated in the pilot project "Climate and Oceanographic Variability and their Impacts on Fisheries"[92] that was completed in 2005.					
2.	Developing a Method for Adaptive Management and Protection from Climate Change in Mangrove and Coral Reef Ecosystems[93]	This project sought to develop a generalizable approach for assessing vulnerability and adaptation of mangroves and associated ecosystems in high biodiversity tropical mangrove areas and associated coral reed, sea-grass and upland ecosystems.	GEF/UNEP; WWF; Partner organizations	WWF, Wetlands International, Institute of Applied Sciences, Wildlife Conservation Society, communities	Capacity building	2007–2009	Coastal zone management; Ecosystem conservation	*Global:* Cameroon, Fiji, Tanzania
			In Fiji: additional information required.					
3.	Regional Partnerships for Climate Change Adaptation and Disaster Preparedness[94]	The outcome is expected to be a strengthened information system that will support informed decision-making aimed at minimizing the negative social and environmental impacts of catastrophic	ADB *Budget:* US$1.0 million	World Bank	Capacity building	Phase 1: 2007–2011	Disaster risk management	*Regional:* Cook Islands, Fiji, PNG, Samoa, Solomon

[91] BOM, http://www.bom.gov.au/climate/pi-cpp/pilot_projects/water_security.shtml
[92] BOM, http://www.bom.gov.au/climate/pi-cpp/pilot_projects/fisheries_guide.shtml
[93] Wetlands, http://wetlands.org/Whatwedo/Ourfieldprojects/Projectarchive/tabid/59/mod/601/articleType/ArticleView/articleId/1994/Default.aspx
[94] ADB, http://www.adb.org/Projects/project.asp?id=41187

Name		Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
		events. It will also mitigate the financial risk of participating Pacific developing member countries to the effects of natural disasters, including those exacerbated by human-induced climate change. This work is linked to the World Bank's work on the development of a Caribbean Catastrophe Insurance Facility for the Pacific.						Islands, Tonga, Tuvalu, and Vanuatu
			In Fiji: Data gathering for country-specific risk models to be developed. These models will be used to assess the feasibility of catastrophe risk financing and insurance options.[95]					
4.	Vulnerability and Adaptation Initiative[96]	Through this initiative, six Pacific countries have implemented activities to reduce their vulnerability to climate change and achieve good environmental outcomes. The Initiative has funded activities such as the replanting of coastal mangroves to protect shorelines, the construction of rain water tanks in islands affected by seasonal drought, the trialing of versatile crop varieties and the recording of traditional knowledge about disaster preparation.	AusAID		Field implementation; Capacity building	2008–2012	Multi-sectoral	*Regional:* Fiji, Samoa, Solomon Islands, Tonga, Tuvalu and Vanuatu
			In Fiji: Additional information required.					
5.	Pacific Islands Adaptation to Climate Change Project (PACC)[97]	PACC will implement long-term adaptation measures to increase the resilience of a number of key development sectors in the Pacific Islands to the impacts of climate change. This objective will be achieved by focusing on adaptation response strategies, policies and measures to bring about this result. The key development sectors this project will focus on are: 1. water resources management; 2. food production and food	SCCF, co-financing *Budget:* US$59,526,299	UNDP, ADB, SPREP	Capacity building; Policy formation and integration	2008–2012	Agriculture; Coastal zone management; Freshwater supply	*Regional:* Cook Islands, FSM, Fiji, Nauru, Palau, PNG, Solomon Islands, Tonga, Tuvalu, Vanuatu

[95] ADB, http://www.adb.org/Documents/TARs/REG/41187-REG-TAR.pdf
[96] AusAID, http://www.ausaid.gov.au/country/pacific/climate_change.cfm
[97] GEF, http://www.thegef.org/gef/sites/thegef.org/files/documents/document/09-16-08-SCCF.pdf

Name		Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
		security; and 3. coastal zone and associated infrastructure (roads and breakwater). To ensure sustainability of the project, regional and national adaptation financing instruments will constitute a fourth component of the project.	*In Fiji:* Demonstration measures to reduce vulnerability in coastal areas and crop production. Regional workshops.					
6.	Coastal and Marine Resources Management in the Coral Triangle of the Pacific (under the Pacific Alliance for Sustainability Program and the Coral Triangle Initiative)[98]	To promote the conservation and sustainable use of globally significant coastal and marine resources in the Coral Triangle region through the introduction of integrated and ecosystem-based coastal and marine resources management in five Pacific countries. Includes the implementation of pilot adaptation measures to enhance resilience and increase capacity to respond to the adverse impacts of climate change on coastal and marine ecosystems.	GEF-SPA; Japan; Australia; United States *Budget:* US$27,568,183	ADB	Capacity building, Research; Field implementation	2008–2013	Coastal zone management; Marine management	*Regional:* FSM, Fiji, Palau, PNG, Solomon Islands and Vanuatu *Plus:* Timor-Leste
			In Fiji: Additional information required.					
7.	Strengthening the Capacity of Pacific Developing Member Countries to Respond to Climate Change (Phase 1)[99]	Incorporation of climate risk management, adaptation practices, and greenhouse gas mitigation measures into infrastructure and key sector investment plans and project designs. Adaptation related actions include: • Pacific Climate Change Program–will assist participating countries to improve their resilience to climate change impacts through (i) mainstreaming of the adaptation in their policies, plans, programs, and projects; and (ii) strengthening their systems and capabilities to foster the adaptation	ADB, Canada *Budget:* US$4.965 million	ADB	Capacity building; Policy formation and integration	2009–?	Government	*Regional:* Cook Islands, Fiji, FSM, Kiribati, Marshall Islands, Nauru, Palau, PNG, Samoa, Solomon Islands, Tonga, Tuvalu, Vanuatu. *Plus:* Timor-

[98] GEF, http://www.gefonline.org/projectDetailsSQL.cfm?projID=3591
[99] ADB, http://pid.adb.org/pid/TaView.htm?projNo=43071&seqNo=01&typeCd=2#timetable

Name		Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
		process; and • Adaptation preparation–up to five countries will be supported in preparing the implementation of climate change adaptation plans, including further capacity building						Leste
			In Fiji: To be determined					
8.	Pacific Mangroves Initiative[100]	In this project data will be collected and analyzed to identify climate risks and assist participating countries to create policies for management and restorations of mangroves and associated ecosystems. Public awareness will also be part of the project.	German Federal Environment Ministry *Budget:* €2,297,249	IUCN, University of the South Pacific, SPREP	Research; Capacity building	2009–2013	Coastal zone management; Government	*Regional:* Fiji, Samoa, Solomon Islands, Tonga, Vanuatu
			In Fiji: Additional information required.					
9.	Coping with Climate Change in the Pacific Island Region[101]	Enhance the competence and capabilities of the local population, the national governmental authorities and regional organizations—SPC and SPREP—in order to cope with the effects of climate change and combat its causes. It includes reviewing policies and integrating adaptation considerations into them, and focuses on the management of land and coastal natural resources, as well as tourism. At the regional level, the program aligns with the Pacific Island Framework for Action on Climate Change 2006–2015. Originally only involving Fiji, Tonga, Vanuatu, the project has been	German Federal Ministry for Economic Cooperation and Development *Budget:* €17.2 million	GIZ, SPC	Capacity building; Policy formation and integration; Field implementation	2009–2015	Agriculture; Forestry; Tourism	*Regional:* FSM, Fiji, Kiribati, Marshall Islands, Nauru, Palau, PNG, Samoa, Solomon Islands, Tonga, Tuvalu, Vanuatu
			In Fiji: The program is working with relevant actors to protect forest resources.[102]					

[100] BMU, http://www.bmu-klimaschutzinitiative.de/en/projects?p=1&d=525
[101] GIZ, http://www.gtz.de/en/weltweit/asien-pazifik/27718.htm and SPC, http://www.spc.int/lrd/index.php?option=com_content&view=article&id=478&Itemid=44
[102] GIZ, http://www.gtz.de/en/weltweit/asien-pazifik/27718.htm

Name		Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
		expanded and extended.						
10.	Cities and Climate Change Initiative Asia Pacific[103]	This initiative aims to strengthen the climate change response of cities and local governments. The main objectives are to: promote active climate change collaboration between local governments and associations; to enhance policy dialogue on climate change; to support local governments in preparing climate action plans; and to foster awareness, education and capacity building.	UN-Habitat *Budget:* US$10 million	Local governments, universities	Capacity building; Knowledge communication; Policy formation and integration	2010–?	Urban areas	*Asia Pacific:* China, Fiji, Indonesia, Mongolia, Nepal, Papua New Guinea, Samoa, Sri Lanka, Vanuatu and Viet Nam
			In Fiji: Monitoring sea level and rainfall volume; raising awareness through non-governmental organizations and government agencies; education awareness; integrated coastal watershed management initiatives; waste disposal management; and corporate carbon reduction initiatives.[104]					
11.	Piloting Climate Change Adaptation to Protect Human Health[105]	To increase adaptive capacity of national health system institutions, including field practitioners, to respond to climate change-sensitive health risks. The expected outputs of the project are: • Early warning systems will be adjusted to include climate change induced health risks. • Capacity of health sector institutions to respond to climate-sensitive health risks will be improved. • Prevention measures piloted in emerging and epidemic risk area. • Cooperation among participating	SCCF; co-financing *Budget:* US$20,933,244	UNDP, WHO	Capacity building; Field implementation	2009–2014	Human health; Disaster risk management	*Global:* Barbados, Bhutan, China, Fiji, Jordan, Kenya and Uzbekistan
			In Fiji: The principal expected benefit for the health sector is having a functional Health Information System that is capable of generating Early Warnings for climate sensitive diseases and communicating these effectively to relevant stakeholders. The project will also: create awareness amongst communities; further strengthen interdisciplinary collaboration and communication within all levels the Ministry of Health; strengthen inter-sectoral collaboration at all levels with other key government agencies (such as the Fiji Meteorological Service and the National Disaster Management Office) and					

[103] CCCI, http://www.fukuoka.unhabitat.org/programmes/ccci/index_en.html
[104] UN-Habitat, http://www.fukuoka.unhabitat.org/programmes/ccci/pdf/Lami_flyer_July_2010.pdf
[105] GEF, http://www.thegef.org/gef/sites/thegef.org/files/documents/document/10-30-09-SCCF.pdf

Name		Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
		countries promotes innovation in adaptation to climate change including variability.	organizations such as the International Federation of Red Cross and Red Crescent. The project contributes to the revival of the Fiji Climate Change Country Team to ensure proper coordination of climate change activities in the country.[106]					
12.	Asia Pacific Climate Change Adaptation Project Preparation Facility (ADAPT)[107]	Increase access to financial resources for climate change adaptation investment projects; strengthen national human and institutional capacity in preparation of financing proposals; and strengthen regional knowledge platform to share information and processes on climate change projects, funds and best practices to promote replication and scaling up.	USAID *Budget:* US$18.0 million	WWF, Conservation International, the Nature Conservancy, ARD Inc., NOAA	Capacity building; Knowledge communication	2011–2016	Government	*Asia Region:* Bangladesh Cambodia FSM, Fiji, Indonesia, Lao PDR, Malaysia, Nepal, Palau, Philippines, Solomon Islands, Sri Lanka, Thailand, Viet Nam
			In Fiji: To be determined.					

D. Proposed Adaptation Action

As described in Table 3, Fiji has submitted a project to the Adaptation Fund for consideration.

Table 3: Proposed Adaptation Projects and Programs in Fiji

Name		Objectives	Type of project	Priority Sector(s)	Geographic focus (if any)
1.	Enhancing Resilience of Rural Communities to Flood and Drought-Related Climate Change and Disaster	This project will integrate climate change into current flood/drought risk management through information generation, training and dissemination. The project will	Capacity building	Disaster risk management	Ba Catchment Area
			Notes: Submitted to the Adaptation Fund Board. Concept		

[106] GEF, http://www.thegef.org/gef/sites/thegef.org/files/documents/document/10-30-09-SCCF.pdf
[107] USDS, http://www.state.gov/documents/organization/151686.pdf

Name	Objectives	Type of project	Priority Sector(s)	Geographic focus (if any)
Risks in the Ba Catchment Area of Fiji[108]	concentrate on four areas: • Climate early warning and information systems • Community based adaptation to flood and drought related risk and hazards • Institutional strengthening to support climate-and disaster-resilient policy frameworks • Awareness raising and knowledge management	approved by Adaptation Fund Board in June 2011. *Proposed implementing agency:* UNDP, Fiji Department of the Environment Proposed budget: US$5,728,800 Proposed timeline: 2012–2015		

E. Assessment

Fiji is actively engaged in addressing climate change at both the policy and project level. It is involved in a very high number of international projects relative to other Pacific Island countries, including its unique participation in the World Health Organization's "Piloting Climate Change Adaptation to Protect Human Health" project. This project helps Fiji address one its four priority areas of adaptation, with human health being the least represented within ongoing initiatives. Most of the adaptation action in Fiji focuses on its important coastal zone and water management needs. Greater attention may also be given to addressing the country's adaptation priorities in the agriculture sector. In addition, none of the currently identified projects specifically focus on the gender dimensions of climate change.

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Government of the Republic of the Fiji Islands [GRFI] (2009). Our Country. Retrieved from Fiji Government Online Portal: http://fiji.gov.fj/index.php?option=com_content&view=article&id=645&Itemid=196

[108] Adaptation Fund, http://www.adaptation-fund.org/sites/default/files/AFB.PPRC_.5.7%20Proposal%20for%20Fiji_1.pdf and http://www.adaptation-fund.org/sites/default/files/AFB14_Report_English.pdf

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4.0 Kiribati

AusAID	Australia Agency of International Development
DRR	Disaster Risk Reduction
GEF	Global Environment Facility
GFDRR	Global Facility for Disaster Reduction and Recovery
LDCF	Least Developed Countries Fund
MELAD	Ministry of Environment, Land and Agricultural Development
MESD	Kiribati Ministry of Environment and Social Development
NAPA	National Adaptation Program of Action
PNG	Papua New Guinea
SPA	Strategic Priority on Adaptation (Global Environment Facility)

The Republic of Kiribati is an island nation comprised of a group of 33 islands in the tropical Pacific Ocean, with a population of approximately 98,000. Kiribati is amongst the poorest and least developed countries in the world; having few natural resources, the main industries in Kiribati are tourism and the exports of copra and fish (CIA, 2011). The combination of its geographic location and economic situation make this one of the most vulnerable countries in the world to climate change. The main concerns for Kiribati are sea level rise, extensive coastal erosion and stress on native flora (MESD, 1999).

A. Adaptation Needs and Priorities

The Kiribati Government's Initial National Communication to the United Nations Framework Convention on Climate Change released in 1999 describes the vulnerabilities of the country, with a focus on the potential adverse impacts of sea level rise. The impacts include brackish water invasions, coastal erosion and reduced groundwater quality and quantity. Throughout the document, there in an emphasis on the melding of traditional practices in agriculture and extreme weather event preparation. This report includes a list of projects planned by the Kiribati government to address is adaptation needs, including (MESD, 1999):

- Establishment of a climate change and sea level monitoring center.
- Formation of an integrated coastal zone management plan.
- Public awareness programming.

- Education and training program.
- Research and information dissemination.
- Technology transfers program.
- Water supplies program.
- Alternative energy source program.

In its National Adaptation Programme of Action (NAPA), Kiribati builds upon these observations to identify nine key areas in which adaptation action is required. These nine key areas (as detailed in Table 3) include implementation in the areas of (MELAD, 2007):

- Freshwater–A water resources adaptation project; and a well improvement project to improve public health;
- Coastal zones–A coastal zone management program for adaptation;
- Risk reduction and monitoring–A strengthening of climate change information and monitoring program; upgrading of coastal defenses and causeways; and upgrading of meteorological services;
- Marine resources–Coral monitoring, restoration and stock enhancement; and
- Agriculture–Agricultural food crops development.

B. National Level Policies and Strategic Documents

The prominent documents of the Government of Kiribati that document is adaptation needs, priorities and action plans are its Initial National Communication and its NAPA, the latter of which was released in 2007. As well, Kiribati has initiated efforts to mainstream climate change adaptation and disaster risk reduction into its development processes through the Kiribati Adaptation Program, adoption of a Climate Change Adaptation Policy Note and a Climate Change Adaptation Strategy released in 2005. This strategy identifies eight priority areas for action: (1) integration of climate change adaptation into national planning and institutional capacity; (2) use of external financial and technical assistance; (3) population and resettlement; (4) government and services; (5) freshwater resources and supply systems; (6) coastal structures, land use and agricultural production; (7) marine resources; and (8) survivability and self-reliance (Government of Kiribati, 2005).

As well, the Kiribati Development Plan (2008–2011) recognizes the potential adverse consequences of climate change for national development. In addition, Kiribati's National Water Resource Policy completed in 2008 integrates consideration of the need to adapt to the impacts of climate change (KAP, n.d.).

Table 1: Key Government Policies and Reports reflecting Adaptation Needs, Priorities and Planned Actions

Name of Policy Action		Government Division Responsible	Status	Sector(s) of Focus	Summary description
1.	Kiribati Government Initial Communication under the United Nations Convention on Climate Change[109]	Ministry of Environment and Social Development	Released October 1999	Multi-sectoral	This document outlines the national circumstances of Kiribati, and the greenhouse gas emissions and possible strategies for mitigation. The vulnerability and adaption sections outlined the specific sectors and the most important impacts from climate change on Kiribati–the most prevalent being sea level rise. There is also a list of current programs that are already implemented in Kiribati that may aid in adaptation to climate change.
2.	Government of Kiribati Policy on Adaptation to Climate Change[110]	Government of the Republic of Kiribati	Released June 2005	Multi-sectoral	The policy sets forward the objectives of ensuring that Kiribati is mentally, physically and financial prepared to adapt to the impacts of climate change; pursuing efforts through coordinated and participatory-based adaptation programming; and requiring external financial assistance.
3.	Government of Kiribati Climate Change Adaptation Strategy[111]	Government of the Republic of Kiribati	Released June 2005	Multi-sectoral	This document identifies eight priority areas of action and the planned strategies that will be used in relation to each to promote adaptation.
4.	Republic of Kiribati National Adaptation Program of Action (NAPA)[112]	Environment and Conservation Division, Ministry of Environment, Land an Agricultural Development	Released January 2007	Multi-sectoral	This document briefly outlines the situation of Kiribati from a socioeconomic and geographical perspective. The main features of this document are the detailed climate change adaptation program profiles that cross all sectors.
5.	Kiribati Development Plan: 2008-2011[113]	Ministry of Finance and Economic Development	Released April 2008	Multi-sectoral	The plan addresses six priority areas: human resource development; economic growth and poverty reduction; health; environment; governance; and infrastructure. Climate change adaptation is addressed with the environment priority in relation to greater monitoring and control of coastal erosion
6.	National Water Resource Policy[114]	Coordinated by the National Water and Sanitation Committee through the Ministry of	Released September 2008	Freshwater supply	The policy builds on the 2005 Policy on Adaptation to Climate Change and specifically identifies the impacts of climate variability and change on the availability of fresh water as one of 15 issues that urgently needs to be addressed. A National Water

[109] UNFCCC, http://unfccc.int/resource/docs/natc/kirnc1.pdf
[110] Climate Change Adaptation Policy, http://issuu.com/infodev/docs/cca_policy
[111] Climate Change Adaptation Strategy, http://www.environment.gov.ki/CC/KirCCA%20Strategy%202005.pdf
[112] UNFCCC, http://unfccc.int/resource/docs/napa/kir01.pdf
[113] Kiribati Development Plan (2008–2011), http://www.sprep.org/att/irc/ecopies/countries/kiribati/87.pdf
[114] National Water Resource Policy, http://www.sprep.org/att/IRC/eCOPIES/Countries/Kiribati/94.pdf

Name of Policy Action		Government Division Responsible	Status	Sector(s) of Focus	Summary description
		Public Works and Utilities			Resources Implementation Plan was developed to support achievement of its objectives.

C. Current Adaptation Action

The moderate number of adaptation projects, relative to other Pacific Island developing countries, are underway in Kiribati, most of which seek to build local capacity. The projects mainly focus on several sectors, namely: coastal zone management, water, meteorology, forestry and fisheries. Notably, Kiribati has hosted the Kiribati Adaptation Program since 2003. This program has progressively support understanding of climate change impacts, development of adaptation measures and the integration of adaptation into policy and planning. In its third phase, this initiative is supporting implementation of actions identified in Kiribati's NAPA.

Table 2: Current Adaptation Projects and Programs active in Kiribati

Name		Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
National Action								
1.	Kiribati Adaptation Program Phase II–Pilot Implementation Phase[115]	The program aims to "develop and demonstrate the systematic diagnosis of climate-related problems and the design of cost-effective adaptation measures, while continuing to integrate climate risk awareness and responsiveness into economic and operational planning. The project has 5 broad components: 1) policy, planning, and information; 2) reducing the vulnerability of the coastline including key public assets and ecosystems 3) the development and management of freshwater resources; 4) providing technical assistance to build capacity at island and	World Bank, GEF-SPA; AusAID; New Zealand Budget: US$$6.87 million	World Bank	Policy formation and integration; Field implementation	2006–2011	Multi-sectoral	

[115] World Bank, http://web.worldbank.org/external/projects/main?pagePK=64283627&piPK=73230&theSitePK=40941&menuPK=441920&Projectid=P089326

Name		Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
		community level; and 5) project management."[116]						
2.	Kiribati Adaptation Program Phase III[117] / Increasing Resilience to Climate Variability and Hazards[118]	The project aims to improve the climate resilience of Kiribati's government and communities by strengthening their capacity to manage climate change effects and improve the management and governance of water resources and infrastructure. Other objectives of the project include increasing the availability and quality of water at the community level and protecting targeted coastal areas from storm waves and flooding.	AusAID, LDCF, Japan Policy and Human Resources Development Fund, GFDRR, Government of Kiribati *Budget:* US$10.8 million	World Bank	Capacity building; Field implementation	2011–2016	Freshwater supply ; Coastal zone management; Disaster risk management; Human health	
Participation in Regional and Global Actions								
3.	Pacific Islands Climate Prediction Project[119]	The project aimed to expand understanding of how seasonal climate prediction services can be applied to support climate-sensitive decision making and the use of climate predictions by National Meteorological Services and industries/agencies which use climate information (e.g. farmers, tourism, water resource managers and health authorities). Along with the provision of software tailored to local circumstances and training in the effective use of climate predictions in a risk management context,	AusAID *Budget:* AU$3.0 million	Australia Bureau of Meteorology	Research; Capacity building	Phase I: 2004–2006 Phase II: 2007–2009 (*completed*)	Climate information services	*Regional:* Cook Islands, Fiji, Kiribati, Niue, PNG, Samoa, Solomon Islands, Tonga, Tuvalu, Vanuatu
			In Kiribati: Weather forecasting with emphasis on temperature, rainfall and tropical					

[116] World Bank, http://web.worldbank.org/external/projects/main?pagePK=64283627&piPK=73230&theSitePK=40941&menuPK=441920&Projectid=P089326
[117] SIDS-L, http://sids-l.iisd.org/news/world-bank-gef-fund-kiribatis-adaptation-programme/
[118] LDFC, http://www.thegef.org/gef/node/4723
[119] BOM, http://www.bom.gov.au/climate/pi-cpp/ and ALM, http://www.adaptationlearning.net/project/pacific-islands-climate-predictions-project-pi-cpp

Name		Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
		the project undertook specific pilot activities.	cyclone prediction. Participated in the pilot projects "Climate and Oceanographic Variability and their Impacts on Fisheries"[120] completed in 2005 and "Application of Climate Forecasting in Water Management"[121] completed in 2008.					
4.	Preparedness for Climate Change[122]	The aim of this program was for the Red Cross and Red Crescent National Societies in countries particularly vulnerable to climate change to gain a better understanding of climate change and its impacts to identify country-specific adaptation measures in line with risks. Activities could include organizing a workshop on risks, assessment of risks through preparation of a background document, capacity building programs, and developing climate change resilient plans.	Red Cross/Red Crescent Climate Centre	National Red Cross/Red Crescent Societies	Capacity building; Policy formation and integration	Phase 1: 2006–2009 Phase 2: ongoing	Disaster risk management;	*Global:* 39 countries *Pacific participants in Phase 1:* Cook Islands, Kiribati, Solomon Islands, Tonga
			In Kiribati: By the conclusion of the first phase of activity, the national Red Cross Society had completed an assessment of climate change risks in the country.[123]					
5.	Strengthening the Capacity of Pacific Developing Member Countries to Respond to Climate Change (Phase 1)[124]	Incorporation of climate risk management, adaptation practices, and greenhouse gas mitigation measures into infrastructure and key sector investment plans and project designs. Adaptation related actions include: • Pacific Climate Change Program–will assist participating countries to improve their resilience to climate change impacts through (i) mainstreaming of the adaptation in their policies, plans, programs, and projects; and (ii)	ADB, Canada *Budget:* US$4.965 million	ADB	Capacity building; Policy formation and integration	2009–?	Government	*Regional:* Cook Islands, Fiji, FSM, Kiribati, Marshall Islands, Nauru, Palau, PNG, Samoa, Solomon Islands, Tonga, Tuvalu,

[120] BOM, http://www.bom.gov.au/climate/pi-cpp/pilot_projects/fisheries_guide.shtml
[121] BOM, http://www.bom.gov.au/climate/pi-cpp/pilot_projects/water_mgt.shtml
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[124] ADB, http://pid.adb.org/pid/TaView.htm?projNo=43071&seqNo=01&typeCd=2#timetable

Name		Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
		strengthening their systems and capabilities to foster the adaptation process; and • Adaptation preparation–up to five countries will be supported in preparing the implementation of climate change adaptation plans, including further capacity building						Vanuatu. *Plus:* Timor-Leste
			In Kiribati: To be determined					
6.	Coping with Climate Change in the Pacific Island Region[125]	Enhance the competence and capabilities of the local population, the national governmental authorities and regional organizations—SPC and SPREP—in order to cope with the effects of climate change and combat its causes. It includes reviewing policies and integrating adaptation considerations into them, and focuses on the management of land and coastal natural resources, as well as tourism. At the regional level, the program aligns with the Pacific Island Framework for Action on Climate Change 2006–2015. Originally only involving Fiji, Tonga, Vanuatu, the project has been expanded and extended.	German Federal Ministry for Economic Cooperation and Development *Budget:* €17.2 million	GIZ, SPC	Capacity building; Policy formation and integration; Field implementation	2009–2015	Agriculture; Forestry; Tourism	*Regional:* FSM, Fiji, Kiribati, Marshall Islands, Nauru, Palau, PNG, Samoa, Solomon Islands, Tonga, Tuvalu, Vanuatu
			In Kiribati: To be determined					
7.	Mainstreaming Gender Aspects in Climate Change Adaptation and Low-Carbon Development[126]	This project contributes to mainstreaming gender into climate change adaptation and low-carbon development measures in climate policy. It produces training material and over the long term will improve the adaptive capacity of local communities in Bangladesh and the Pacific region.	German Federal Ministry for the Environment, Nature Conservation	GenerCC–Women for Climate Justice, Centre for Global Change, Secretariat of the Pacific	Capacity building	2010–2013	Gender	*Asia-Pacific:* Bangladesh, Kiribati, Marshall Islands, Nauru

[125] GIZ, http://www.gtz.de/en/weltweit/asien-pazifik/27718.htm and SPC, http://www.spc.int/lrd/index.php?option=com_content&view=article&id=478&Itemid=44

[126] BMU, http://www.bmu-klimaschutzinitiative.de/en/projects?p=1&d=673

Name		Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
			, and Nuclear Safety *Budget:* €451,339	Community				
			In Kiribati: To be determined					

D. Proposed Adaptation Action

Within its NAPA, Kiribati identified nine priority projects for implementation, as outlined in Table 3. Some of these planned actions are now being supported through the project "Increasing Resilience to Climate Variability and Hazards" financed by the Least Developed Countries Fund (LDCF).

Table 3: Proposed Adaptation Projects and Programs in the National Adaptation Programme for Action for Kiribati

Name		Objectives	Type of project	Priority Sector(s)	Geographic focus (if any)
1.	Water Resource Adaptation Project	To maintain and conserve available good ground water lenses; to gain users confidence in the reliability of the distribution system and promote their willingness to pay, based on consumed quantity; to increase water storage and water resources to meet current demands and at times of serious droughts; to manage risks to water resources throughout the atolls; and to assess impacts of urban water supplies on other natural resources, systems and subsistence activities. This will be achieved through risk assessments and the design and implementation of responses, including sustainable community-based monitoring system.	Capacity building	Agriculture; Human health; Freshwater supply	Kiribati
			Notes: Indicative costs: AUD 2,174,500; Local annual budget: AUD 993,900; Total NAPA costs over 3 years: 3,168,405 Responsible Ministry: MPWU		
2.	Simple Well Improvement	Reduce the burden of diarrhea and other water related diseases and problems particularly among very young and old people in Kiribati. This will be achieved by improving over the period of three years, 500 ground water wells that are used by the communities for their drinking and	Capacity building	Human health; Freshwater supply	
			Notes: Indicative costs: AUD 146,000; Local annual budget: AUD 190,470; Total NAPA costs over 3 years: 336,470 Responsible Ministry: MHMS		

Name		Objectives	Type of project	Priority Sector(s)	Geographic focus (if any)
		cooking.			
3.	Coastal Zone Management and Resilience Enhancement for Adaptation	To improve public awareness of the coastal processes and climate change impacts. To develop and pilot community-based coastal management regime by establishing community groups (essentially villages). To encourage communities to participate in coastal-ecosystem enhancement projects and to develop their own small scale projects with similar purposes. To streamline regulatory controls and conditions so as to ensure the resilience of the coastal areas and to ensure the sustainable use of coastal resources is enhanced	Capacity building	Coastal zone management; Marine management	
			Notes: Indicative costs: AUD 1,312,910; Local annual budget: AUD 624,370; Total NAPA costs over 3 years: 1,937,280 Responsible Ministry: MELAD, MPWU, MFMRD		
4.	Strengthening Environmental, Climate Change Information and Monitoring	To strengthen the capability of the government to be able to keep abreast of, understand and interpret international scientific information relevant to Kiribati. To establish a central office to access and share information on climate change issues from reliable regional and international sources. To develop endogenous scientific capability for analyzing and reviewing information, and undertaking research related to climate change. To enhance Kiribati capacity to implement its obligations under climate change international agreements.	Capacity building	Climate information services; Government	
			Notes: Indicative costs: AUD 227,000; Local annual budget: AUD 90,410; Total NAPA costs over 3 years: 317,410 Responsible Ministry: MELAD		
5.	Upgrading of Meteorological Service	To improve the reliability and scope of weather observation on outer islands, and reporting to the National Meteorological Services. Institutional strengthening of the National Meteorological Services. To foster greater appreciation and use of various meteorological products that are produced directly or indirectly from outputs of the National Meteorological Services. To increase the National Meteorological Service role in enabling the public and individuals to be able to manage risks from extreme weather events	Capacity building	Climate information services	
			Notes: Indicative costs: AUD 150,000; Local annual budget: AUD 342,310; Total NAPA costs over 3 years: 492,310 Responsible Ministry: Kiribati Meteorological Service, MCTT		
6.	Agricultural Food Crops Development	To maintain main existing gene banks; to increase and diversify food crop production throughout Kiribati; to	Capacity building	Agriculture	
			Notes: Indicative costs: AUD 450,000; Local annual budget: AUD		

Name		Objectives	Type of project	Priority Sector(s)	Geographic focus (if any)
		make more people attracted to, see economic opportunities in, and engaged in varieties of agricultural systems; to increase efforts at planning out and meeting support requirements for agricultural activities throughout the islands	1,105,230; Total NAPA costs over 3 years: 1,555,230 Responsible Ministry: MELA		
7.	Coral Reef Restoration, Monitoring, and Stock Enhancement	To gain more detailed information on observed coral bleaching, including factors causing health problems to the corals and ciguatera fish poisoning; to establish, implement a sustainable monitoring program to cover two atolls; to pilot a restoration scheme for coral species in areas of low growth; and to establish marine protected areas. To establish a project where stock enhancement contributes in maintaining a vigorous coral reef.	Capacity building; Field implementation	Marine management; Ecosystem restoration	
			Notes: Indicative costs: AUD 499,000; Local annual budget: AUD 87,750; Total NAPA costs over 3 years: 586,750 Responsible Ministry: MFMRD, MHM		
8.	Upgrading, Restoring, Enhancing Resilience of Coastal Defenses and Causeways	To prevent encroaching coastal erosion from affecting public infrastructure such as roads, airfields and community public assets by upgrading existing seawalls; To improve accessibility within the atolls which has been facilitated by causeways. Accessibility is, in a few cases, threatened by the inadequacy of causeway designs and/or change in the environment; To minimize potential risks to assets from climate-related disasters	Capacity building	Coastal zone management	
			Notes: Indicative costs: AUD 5,102,870; Local annual budget: AUD 567,880; Total NAPA costs over 3 years: 5,670,750 Responsible Ministry: MISA, MWP		
9.	Enabling Kiribati Effective Participation at Regional and International Forums on Climate Change	To enhance the effectiveness of conveying climate change related information based on Kiribati national circumstances to regional and international meetings on climate change. To increase Kiribati capability to influence international efforts at mitigating climate change, and at addressing immediate and urgent, and longer term adaptation needs.	Capacity building	Government	
			Notes: Indicative costs: AUD 60,000; Local annual budget: AUD 45,000; Total NAPA costs over 3 years: 105,000 Responsible Ministry: MFAI		

E. Assessment

Kiribati, through the development of its NAPA, has prioritized and developed programs for adaptation to climate change that will address many of its needs. A moderate number projects and programs underway in the country address its identified priority sectors of

water, coastal zones, marine resources, agriculture and risk reduction and monitoring. Of these sectors, actions that reduce vulnerabilities related to agriculture and marine resources may be under-represented. Through the project "Mainstreaming Gender Aspects in Climate Change Adaptation and Low-Carbon Development" it is also developing gender-sensitive adaptation indicators and measures for future political strategies. Greater attention may also be given to the health-related impacts of climate change.

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5.0 Marshall Islands

ADB	Asian Development Bank
CIA	Central Intelligence Agency
EPA	Environmental Protection Agency
PICCAP	Pacific Islands Climate Change Assistance Program
SCCF	Special Climate Change Fund
SPREP	South Pacific Regional Environment Program
UNDP	United Nations Development Programme
UNFCCC	United Nations Framework Convention on Climate Change

The Marshall Islands are a chain of 29 atolls off the northeast coast of New Zealand. The islands collectively have a land area of approximately 181 square kilometers, but the Marshall Island's Exclusive Economic Zone extends 200 nautical miles from its coasts. The country has a total estimated population of 67,000 people who mainly live in Majuro, the capital, and Ebeye. Subsistence agriculture and fishing the country's main industry; the tourism industry makes a noteworthy contribution along with a development fund from the United States (CIA, 2011).

A. Adaptation Needs and Priorities

The major impacts that climate change is projected to have in the Marshall Islands are sea level rise and associated shoreline erosion (EPA, 2000). This observation reflects the low-lying nature of the atolls the form the country; its highest point of land is found on the island of Likiep and extends 10 meters above sea level (CIA, 2011). In its Initial National Communication to the United Nations Framework Convention on Climate Change (UNFCCC) released in 2000, the Marshall Islands identified the following sectors as being particularly vulnerable to climate change: water resources, coastal resources, agriculture resources, marine resources (including fisheries) and human health (EPA, 2000). To address these vulnerabilities, the Marshall Islands identified the following actions (EPA, 2000):

- Institutional strengthening, such as by ensuring that governmental departments are adequately structured and equipped with appropriate skills and tools, and are capable of delivering an integrated response to the challenges arising from climate change and accelerated sea level rise.
- Project management and operational training for all stakeholders involved in climate change programs and the implementation of adaptation projects.

- Accurate documentation of baseline conditions from which to measure climate induced changes to the shorelines, reef and island ecosystem and affected settlements and communities.
- Research capacity needs to be strengthened by ensuring adequate support at the professional and technical levels, and by providing financial support for baseline bio-physical and socioeconomic environmental research, monitoring changes to environmental conditions and implementing adaptation measures.
- Appropriate systems are needed for spatial and other data generated through vulnerability assessments, monitoring programs, integrated coastal zone management planning and the implementation of adaptation projects.
- Confidence and capacity building programs are needed for government departments, members of local councils and non-government organizations.
- Community awareness and education programs.
- Proactive participation in international forums and meetings are needed with the aim of continuing to keep the issues confronting small island states, when they are responding to climate change.

B. National Level Policies and Strategic Documents

The Initial National Communication (2000) of the Marshall Islands reviews the national activities that have been taking place in the Marshall Islands, including vulnerability and adaptation case study and participation in the Pacific Islands Climate Change Assistance Program (PICCAP). There is a brief outline of the future and immediate adaptation needs of the country, followed by a possible list of policy actions that could help the Marshall Islands adapt to climate change in some key areas (EPA, 2000):

- *Land Use and Planning:* amendment of land use planning policies to include adaptations to climate change.
- *Environment and Natural Resources:* amendment of environmental and natural policies to include adaptations to climate change.
- *Natural Hazard Management:* amendment of natural hazard management policies to include adaptations to climate change.
- *Administration and Management:* initiation of administrative arrangements and management policies to deal with the core sectoral concerns in terms of water resources, coastal resources, agricultural resources, marine resources and human health.
- *Human Health:* Development of a comprehensive suite of human health policies to address water borne diseases and other sicknesses that are related to climate-induced change.
- *Solid and Liquid Waste Management:* Provide broad management policies for domestic solid waste and discharges of liquid effluent including consideration of a strategy to convert solid domestic and some industrial wastes to saleable energy.
- *Foreign Affairs:* Enhancement of foreign policy frameworks.

- *Center of Excellence:* establish a Centre of Excellence to expand the role of the Marshall Islands in the international as well as national issues of climate change.
- *Technology Exchange:* technology exchange policies to address applied research and monitoring (information management).

More recently Marshall Islands developed the *RMI Climate Change Roadmap 2010* as a national framework for their climate change and sustainable development efforts. With respect to adaptation, actions identified by the Marshall Islands Government included: the implementation of a Micronesia Challenge and Reimaanlok Action Plan; planning and interventions to address vulnerability in food security, public health and other social development areas; and protection and maintenance of key infrastructure and resources through planning and inter-agency coordination (FSF, 2010).

Table 1: Key Government Policies and Reports reflecting Adaptation Needs, Priorities and Planned Actions

Name of Policy Action		Government Division Responsible	Status	Sector(s) of Focus	Summary description
1.	Marshall Islands. Initial Communication under the United Nations Framework Convention on Climate Change[127]	Environmental Protection Agency	Released September 2000	Multi-sectoral	This document gives a brief outline on the country and its vulnerabilities to climate change. There is an overview of the national activities of the Marshall Islands, and detailed mitigation measures for greenhouse gas emissions. The immediate and future needs for the country are outlined, noting the need for funding to support many of these types of projects.
2.	RMI National Climate Change Roadmap 2010[128]	Inter-governmental	Draft released August 2010	Multi-sectoral	This document was created through inter-governmental cooperation to collectively address key national development priorities and to create a National Climate Change Policy. It calls for an institutional framework to build on existing framework of sectoral approaches and outlines four implementation clusters: energy security and low carbon future; adaptation for climate-resilient future; disaster preparedness, risk reduction and response capacity; and education, awareness, community mobilization, culture and gender.

[127] UNFCCC, http://unfccc.int/resource/docs/natc/marnc1.pdf
[128] FSF, http://www.faststartfinance.org/recipient_country/marshall-islands

C. Current Adaptation Action

As noted, the Marshall Islands previously participated in the PICCAP, which was initiated in 1995. Funded by the Global Environment Facility and implemented through the United Nations Development Programme, PICCAP was executed by the Secretariat to Pacific Regional Environmental Program in 10 Pacific Island countries (Cook Islands, Federated States of Micronesia, Fiji, Kiribati, Marshall Islands, Nauru, Samoa, Solomon Islands, Tuvalu and Vanuatu) (Plume, 2002).

At present, the Marshall Islands appears to be participating in a low number of adaptation projects relative to other countries in the Pacific region; and all are being undertaken as part of broader, multi-country initiatives. These projects are attending needs related to agriculture, forestry, tourism, gender and policy and planning. Most projects emphasize capacity building, training and policy and planning. Funding for these projects is being provided by the Asian Development Bank (ADB), the Special Climate Change Fund (SCCF), and the governments of Canada and Germany.

Table 2: Current Adaptation Projects and Programs active in the Marshall Islands

Name		Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
Participation in Regional and Global Actions								
1.	Pacific Islands Adaptation to Climate Change Project (PACC)[129]	PACC will implement long-term adaptation measures to increase the resilience of a number of key development sectors in the Pacific Islands to the impacts of climate change. This objective will be achieved by focusing on adaptation response strategies, policies and measures to bring about this result. The key development sectors this project will focus on are: 1. water resources management; 2. food production and food security; and 3. coastal zone and associated infrastructure (roads and breakwater). To ensure sustainability of the project, regional and national adaptation financing instruments will constitute a fourth	SCCF, co-financing *Budget:* US$59,526,299	UNDP, ADB, SPREP	Capacity building; Policy formation and integration	2008–2012	Agriculture; Coastal zone management; Freshwater supply	*Regional:* Cook Islands, FSM, Fiji, Marshall Islands, Nauru, Niue, Palau, Papua New Guinea, Samoa, Solomon Islands, Tonga, Tuvalu, Vanuatu
			In the Marshall Islands: Additional information required.					

[129]GEF, http://www.thegef.org/gef/sites/thegef.org/files/documents/document/09-16-08-SCCF.pdf

		component of the project.						
2.	Strengthening the Capacity of Pacific Developing Member Countries to Respond to Climate Change (Phase 1)[130]	Incorporation of climate risk management, adaptation practices, and greenhouse gas mitigation measures into infrastructure and key sector investment plans and project designs. Adaptation related actions include: • Pacific Climate Change Program–will assist participating countries to improve their resilience to climate change impacts through (i) mainstreaming of the adaptation in their policies, plans, programs, and projects; and (ii) strengthening their systems and capabilities to foster the adaptation process; and • Adaptation preparation–up to five countries will be supported in preparing the implementation of climate change adaptation plans, including further capacity building	ADB, Canada *Budget:* US$4.965 million	ADB	Capacity building; Policy formation and integration	2009–?	Government	*Regional:* Cook Islands, Fiji, FSM, Kiribati, Marshall Islands, Nauru, Palau, PNG, Samoa, Solomon Islands, Tonga, Tuvalu, Vanuatu. *Plus:* Timor-Leste
			In the Marshall Islands: Additional information required.					
3.	Coping with Climate Change in the Pacific Island Region[131]	Enhance the competence and capabilities of the local population, the national governmental authorities and regional organizations—SPC and SPREP—in order to cope with the effects of climate change and combat its causes. It includes reviewing policies and integrating adaptation considerations into them, and focuses on the management of land and coastal natural resources, as well as tourism. At the regional level, the program aligns with the Pacific Island Framework for Action on Climate	German Federal Ministry for Economic Cooperation and Development *Budget:* €17.2 million	GIZ, SPC	Capacity building; Policy formation and integration; Field implementation	2009–2015	Agriculture; Forestry; Tourism	*Regional:* FSM, Fiji, Kiribati, Marshall Islands, Nauru, Palau, PNG, Samoa, Solomon Islands, Tonga, Tuvalu, Vanuatu

[130] ADB, http://pid.adb.org/pid/TaView.htm?projNo=43071&seqNo=01&typeCd=2#timetable
[131] GIZ, http://www.gtz.de/en/weltweit/asien-pazifik/27718.htm and SPC, http://www.spc.int/lrd/index.php?option=com_content&view=article&id=478&Itemid=44

		Change 2006–2015. Originally only involving Fiji, Tonga, Vanuatu, the project has been expanded and extended.	*In the Marshall Islands:* Additional information required.					
4.	Mainstreaming Gender Aspects in Climate Change Adaptation and Low-Carbon Development[132]	This project contributes to mainstreaming gender into climate change adaptation and low-carbon development measures in climate policy. It produces training material and over the long term will improve the adaptive capacity of local communities in Bangladesh and the Pacific region.	German Federal Ministry for the Environment, Nature Conservation, and Nuclear Safety *Budget:* €451,339	GenerCC–Women for Climate Justice, Centre for Global Change, Secretariat of the Pacific Community	Capacity building	2010–2013	Gender	*Asia-Pacific:* Bangladesh, Kiribati, Marshall Islands, Nauru
			In the Marshall Islands: Additional information required.					

D. Proposed Adaptation Action

Proposed adaptation actions within the Marshall Islands were not identified through this review.

E. Assessment

Although involved in climate change adaptation efforts since the early 2000s, and having drafted a national climate change framework in 2010, the Marshall Islands has a low level of implementation of individual adaptation projects. The focus areas of limited number of current projects are reflective of the priorities identified in its National Communication—including agriculture and forestry. The country is also specifically looking at the gender dimensions of climate change through an on-going project and *RMI National Climate Change Roadmap 2010*. However, limited attention appears to have been given to the areas of coastal management, marine resources, human health and water resources. .

[132] BMU, http://www.bmu-klimaschutzinitiative.de/en/projects?p=1&d=673

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6.0 Nauru

ADB	Asian Development Bank
CIA	Central Intelligence Agency
DIDI	Department of Islands Development and Industry
FSM	Federated States of Micronesia
PACC	Pacific Islands Adaptation to Climate Change Project
PNG	Papua New Guinea
SCCF	Special Climate Change Fund
SPREP	Secretariat to Pacific Regional Environmental Program
UNDP	United Nations Development Programme

With an area of 21 square kilometers, Nauru is the world's smallest island nation. Located in the South Pacific approximately 2,900 kilometers northeast from Australia, Nauru's Exclusive Economic Zone extends 200 nautical miles from the country's 30 kilometer coastline. Historically, phosphate was the primary economic resource in Nauru, and the country boosted of having one of the highest rates of Gross Domestic Product per capita. However, these stores were thought to be nearly depleted and the end of phosphate mining left a legacy of environmental degradation and unemployment. The country is now mostly dependent on foreign aid and food imports from Australia and other countries (CIA, 2011).

A. Adaptation Needs and Priorities

The main climate change vulnerabilities in Nauru are sea level rise and the effect that an increase in temperature will have on marine resources and already stressed water and vegetative resources (DIDI, 1999). Due to environmental degradation, Nauru is already experiencing coastal erosion and declines in the productivity of its coral reef systems. Rising ocean temperatures, sea level rise and an increase in the number of intense storms could cause further damage to these ecosystems (DIDI, 1999).

Nauru also has no significant surface water resources; desalination plants and groundwater are its only drinking sources. Water scarcity is already affecting human health. Greater incidence of drought could therefore reduce the sustainability of the country's groundwater resources, the health of its population, and the persistence of a vegetation ecosystem already stressed from major phosphate mining (DIDI, 1999).

In response to these concerns, Nauru identified education and information activities that have been or should be implemented to support is efforts to adapt to the impacts of climate change.

B. National Level Policies and Strategic Documents

Nauru's First National Communication to the United Nations Framework Convention on Climate Change (DIDI, 1999) outlines its baseline situation, highlights the environmental degradation resulting from nearly a century of phosphate mining and the country's commitment but limited capacity to cope with the effects of climate change. This document outlines several initiatives that Nauru has taken part in, and several actions that it would need to take as first steps to adapt to the effects of climate change (particularly sea level rise).

Table 1: Key Government Policies and Reports reflecting Adaptation Needs, Priorities and Planned Actions

Name of Policy Action		Government Division Responsible	Status	Sector(s) of Focus	Summary description
1.	Climate Change Response. Republic of Nauru Response. 1st National Communication–1999. Under the United Nations Framework Convention on Climate Change[133]	Department of Islands Development and Industry and Nauru's National Committee on Climate Change	Released October 1999	Multi-sectoral	This report describes Nauru's background and presents data on its greenhouse gas emissions. It also outlines the country's vulnerabilities to climate change and the different policies and measures that can be taken for mitigation of greenhouse gas emissions and adaptation to sea level rise. The document concludes by outlining education and information activities that have been or should be implemented.

C. Current Adaptation Action

Nauru is involved in a low number of adaptation projects at the regional level as identified in Table 2; no nationally focused adaptation projects have been identified. Through these projects, adaptation action is being implemented on the ground that addresses needs related to agriculture, coastal zone management, water, forestry, tourism, gender and policy and planning.

[133]UNFCCC, http://unfccc.int/resource/docs/natc/naunc1.pdf

Table 2: Current Adaptation Projects and Programs active in Nauru

Name		Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
Participation in Regional and Global Actions								
1.	Pacific Islands Adaptation to Climate Change Project (PACC)[134]	PACC will implement long-term adaptation measures to increase the resilience of a number of key development sectors in the Pacific Islands to the impacts of climate change. This objective will be achieved by focusing on adaptation response strategies, policies and measures to bring about this result. The key development sectors this project will focus on are: 1. water resources management; 2. food production and food security; and 3. coastal zone and associated infrastructure (roads and breakwater). To ensure sustainability of the project, regional and national adaptation financing instruments will constitute a fourth component of the project.	SCCF, co-financing *Budget:* US$59,526,299	UNDP, ADB, SPREP	Capacity building; Policy formation and integration	2008–2012	Agriculture; Coastal zone management; Freshwater supply	*Regional:* Cook Islands, FSM, Fiji, Nauru, Palau, PNG, Solomon Islands, Tonga, Tuvalu, Vanuatu
			In Nauru: Demonstration measures to reduced vulnerability in coastal areas and crop production. Groundwater prospecting and monitoring. Water tanks and water catchment.					
2.	Strengthening the Capacity of Pacific Developing Member Countries to Respond to Climate Change (Phase 1)[135]	Incorporation of climate risk management, adaptation practices, and greenhouse gas mitigation measures into infrastructure and key sector investment plans and project designs. Adaptation related actions include: • Pacific Climate Change Program–will assist participating countries to improve their resilience to climate change impacts through (i) mainstreaming of the adaptation in their policies, plans, programs, and projects; and (ii) strengthening their systems and	ADB, Canada *Budget:* US$4.965 million	ADB	Capacity building; Policy formation and integration	2009–?	Government	*Regional:* Cook Islands, Fiji, FSM, Kiribati, Marshall Islands, Nauru, Palau, PNG, Samoa, Solomon Islands, Tonga, Tuvalu, Vanuatu.

[134]GEF, http://www.thegef.org/gef/sites/thegef.org/files/documents/document/09-16-08-SCCF.pdf
[135] ADB, http://pid.adb.org/pid/TaView.htm?projNo=43071&seqNo=01&typeCd=2#timetable

Name		Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
		capabilities to foster the adaptation process; and • Adaptation preparation–up to five countries will be supported in preparing the implementation of climate change adaptation plans, including further capacity building						*Plus:* Timor-Leste
			In Nauru: Additional information required					
3.	Coping with Climate Change in the Pacific Island Region[136]	Enhance the competence and capabilities of the local population, the national governmental authorities and regional organizations—SPC and SPREP—in order to cope with the effects of climate change and combat its causes. It includes reviewing policies and integrating adaptation considerations into them, and focuses on the management of land and coastal natural resources, as well as tourism. At the regional level, the program aligns with the Pacific Island Framework for Action on Climate Change 2006–2015. Originally only involving Fiji, Tonga, Vanuatu, the project has been expanded and extended.	German Federal Ministry for Economic Cooperation and Development *Budget:* €17.2 million	GIZ, SPC	Capacity building; Policy formation and integration; Field implementation	2009–2015	Agriculture; Forestry; Tourism	*Regional:* FSM, Fiji, Kiribati, Marshall Islands, Nauru, Palau, PNG, Samoa, Solomon Islands, Tonga, Tuvalu, Vanuatu
			In Nauru: Additional information required.					
4.	Mainstreaming Gender Aspects in Climate Change Adaptation and Low-Carbon Development[137]	This project contributes to mainstreaming gender into climate change adaptation and low-carbon development measures in climate policy. It produces training material and over the long term will improve the adaptive capacity of local communities in Bangladesh and the Pacific region.	German Federal Ministry for the Environment, Nature Conservation, and Nuclear	GenerCC–Women for Climate Justice, Centre for Global Change, Secretariat of the Pacific Community	Capacity building;	2010–2013	Gender	*Asia-Pacific:* Bangladesh, Kiribati, Marshall Islands, Nauru

[136] GIZ, http://www.gtz.de/en/weltweit/asien-pazifik/27718.htm and SPC, http://www.spc.int/lrd/index.php?option=com_content&view=article&id=478&Itemid=44

[137] BMU, http://www.bmu-klimaschutzinitiative.de/en/projects?p=1&d=673

Name		Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
			Safety *Budget:* €451,339					
			In Nauru: Additional information required.					

D. Proposed Adaptation Action

There is no evidence of proposed adaptation actions within Nauru at this time.

E. Assessment

Adaptation action in Nauru is low relative to other Pacific Island countries, and it does not appear a number of new projects are in development within the country. It is participating in multi-country projects that address several of its priority areas for adaptation, as well as gender, forestry and tourism. The limited current programming in the country means that some gaps remain within the priority adaptation areas identified by the country, including health and marine resources.

References:

Central Intelligence Agency [CIA] (2011). *The World Factbook: Nauru*. Retrieved from https://www.cia.gov/library/publications/the-world-factbook/geos/nr.html

Department of Islands Development and Industry [DIDI] (1999). *Climate Change Response. Republic of Nauru Response. 1st National Communication - 1999. Under the United Nations Framework Convention on Climate Change.* Retrieved from http://unfccc.int/resource/docs/natc/naunc1.pdf

7.0 Niue

AusAID	Australian Agency for International Development
CIA	Central Intelligence Agency
NMS	Niue Meteorological Services
NZAID	New Zealand Agency for International Development
PNG	Papua New Guinea
SCCF	Special Climate Change Fund
SPREP	South Pacific Regional Environment Program
UNDP	United Nations Development Programme

Niue is an island nation in the South Pacific Ocean approximately 2,400 km northeast of New Zealand. The island collectively has a land area of approximately 260 square kilometers, with its population living in 14 communities located along its coastline (NZAID, n.d.). The main population is gathered in the capital, Alofi (CIA, 2011). Niue has been an associated stated of New Zealand since 1974, and all of its peoples are New Zealand citizens (NZAID, n.d.).

The main industry in the country is subsistence farming and fishing, with some cash crops and processed foods (CIA, 2011). However, much of its economy is dependent on development assistance provided by New Zealand.[138] Tourism could be expanded in the country, particularly with improved air services (NZAID, n.d.). Due to its location on the edge of the tropical cyclone belt, Niue currently is hit by a cyclone about every four years and experiences a severe cyclone about once in every ten years. These events have historically caused significant physical and economic damage to the country (NMS, 2000).

A. Adaptation Needs and Priorities

Through its Initial National Communication to the United Nations Framework Convention on Climate Change, Niue expressed concern about the potential for sea level rise to affect ifs fresh water lens and for an increase in the frequency, intensity and duration of tropical storms (NMS, 2000). Climate change was projected to affect several key sectors (NMS, 2000):

[138] In 2010/11, this assistance totaled NZD 19-million, and focused on building the capacity of the public sector, strengthening economic development and maintenance and improvement of the country's infrastructure (NZAID, n.d.).

- *Agriculture:* more intense rainfall and higher humidity could lead to greater incidence of pests and diseases due to fungi and bacteria; an increase in temperature and evapotranspiration could result in reduced crop yields; and more frequent or intense cyclones could, as in the past, destroy cash and subsistence crops.
- *Biodiversity/Land Use Change and Forestry:* cyclones have a devastating effect on the regeneration of tree species and can damage coral reefs; a rise in sea temperatures could lead to bleaching of the coral in Niue's reef; and changes in temperature, precipitation and other climatic factors may alter the island's terrestrial biodiversity.
- *Coastal Zones and Reefs:* as a high coral atoll country, Niue is less exposed to sea level rise compared to other countries; however, greater wave action due to more frequent or intense storms could lead to greater coastal erosion[139] and coral reefs may be lost due to an increase in tropical cyclone frequency and severity.
- *Human Health:* increased temperatures and a longer rainy season could lead to greater prominence of the mosquito-borne diseases dengue fever and filiarisis; deterioration in water quality caused by more intense rainfall washing pollution into freshwater sources could increase incidences of diarrhea; and fluctuating temperatures could increase susceptibility to influenza and respiratory tract infections.
- *Fisheries:* changes in sea temperatures and consequent modification of ocean currents could affect the type and abundance of marine resources.
- *Freshwater Resources:* in the absence of running surface water sources, groundwater resources are of critical importance to Niue. Greater frequency of drought conditions would restrict recharge of this freshwater lens, and sea level rise could result in salt-water intrusion.

All of these changes will have a variety of socioeconomic impacts. In response, Niue has identified the following priority needs to support its adaptation efforts (NMS, 2000):

- *Capacity Building:* Need for on-going technical training in sector analysis, climate change science, negotiations and policy making.
- *Education and Public Awareness:* Maintain and increase public awareness of issues pertaining to climate change through means such as print, radio, television and competitions.
- *Coastal zones:* promotion of integrated coastal management; integration of land and marine use planning with economic planning; and creation of artificial coasts.

[139] For example, during Cyclone Heta in 2004, waves topped the islands 30 meter cliffs (Jackson, 2009).

- *Agriculture:* promotion of drought resistant and/or tolerant crops; introduction of sustainable agricultural practices; and promotion of research on the development of climate resilient plants and crop species.
- *Forests and biodiversity:* reducing forest clearance; planting native tree species; passing of the National Forest Policy, which provides guidelines on the regulation and implementation over program and activities for the use, management and conservation of the forest resources of Niue; and increasing knowledge of fish migration patterns and marine flora and fauna interactions.
- *Human health:* integrate climate change into health education and promotion programs; strengthen preventative health program; and establish health monitoring database.

B. National Level Policies and Strategic Documents

Niue's Initial National Communication for Niue outlines the national situation at that time, its greenhouse gas emissions, and possible strategies for mitigation of greenhouse gasses. It also sets forward anticipated vulnerabilities to climate change and possible adaptation measures in priority sectors.

Table 1: Key Government Policies and Reports reflecting Adaptation Needs, Priorities and Planned Actions

Name of Policy Action		Government Division Responsible	Status	Sector(s) of Focus	Summary description
1.	Niue Island. Initial Communication under the United Nations Framework Convention on Climate Change[140]	Niue Meteorological Service	Released June 2000	Multi-sectoral	This report outlines the national circumstances of Niue and the vulnerabilities that the island faces to climate change. The main vulnerabilities are outlined, with a focus on the risks associated with higher temperatures, higher likelihood of drought, greater frequency, intensity and duration of cyclones, and sea level rise. Several needs are identified for the adaptation to climate change.

C. Current Adaptation Action

A very low number of adaptation projects—each part of broader regional programs—are on-going in Niue. These focus on capacity building in the areas of climate prediction, agriculture, water and coastal zones, and are being funded through the Australian Agency for International Development (AusAID) and the Special Climate Change Fund (SCCF).

[140] UNFCCC, http://unfccc.int/resource/docs/natc/niunc1.pdf

Table 2: Current Adaptation Projects and Programs active in Niue

Name		Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
Participation in Regional and Global Actions								
1.	Pacific Islands Climate Prediction Project[141]	The project aimed to expand understanding of how seasonal climate prediction services can be applied to support climate-sensitive decision making and the use of climate predictions by National Meteorological Services and industries/agencies which use climate information (e.g. farmers, tourism, water resource managers and health authorities). Along with the provision of software tailored to local circumstances and training in the effective use of climate predictions in a risk management context, the project undertook specific pilot activities.	AusAID *Budget:* AU$3.0 million	Australia Bureau of Meteorology	Research; Capacity building	Phase I: 2004–2006 Phase II: 2007–2009 (*completed*)	Climate information services	*Regional:* Cook Islands, Fiji, Kiribati, Niue, PNG, Samoa, Solomon Islands, Tonga, Tuvalu, Vanuatu
			In Niue: Detailed weather forecasting with emphasis on seasonal outlook for temperature, rain and tropical cyclones. Participated in the pilot project "Climate and Oceanographic Variability and their Impacts on Fisheries"[142] completed in 2005.					
2.	Pacific Islands Adaptation to Climate Change Project (PACC)[143]	PACC will implement long-term adaptation measures to increase the resilience of a number of key development sectors in the Pacific Islands to the impacts of climate change. This objective will be achieved by focusing on adaptation response strategies, policies and measures to bring about this result. The key development sectors this project will focus on are: 1. water resources management; 2. food production and food security; and 3. coastal zone and associated infrastructure (roads and breakwater). To ensure sustainability of the project, regional and national adaptation financing	SCCF, co-financing *Budget:* US$59,526,299	UNDP, ADB, SPREP	Capacity building; Policy formation and integration	2008–2012	Agriculture; Coastal zone management; Freshwater supply	*Regional:* Cook Islands, FSM, Fiji, Marshall Islands, Nauru, Niue, Palau, Papua New Guinea, Samoa, Solomon Islands, Tonga, Tuvalu, Vanuatu

[141] BOM, http://www.bom.gov.au/climate/pi-cpp/ and ALM, http://www.adaptationlearning.net/project/pacific-islands-climate-predictions-project-pi-cpp
[142] BOM, http://www.bom.gov.au/climate/pi-cpp/pilot_projects/fisheries_guide.shtml
[143] GEF, http://www.thegef.org/gef/sites/thegef.org/files/documents/document/09-16-08-SCCF.pdf

Name		Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
		instruments will constitute a fourth component of the project.	*In Niue:* to be determined					

D. Proposed Adaptation Action

Niue has submitted a capacity building project to the Adaptation Fund. The planned project will focus on helping communities and government officers manage the likely effects of climate change in a variety of sectors.

Table 3: Proposed Adaptation Projects and Programs in Niue

Name		Objectives	Type of project	Priority Sector(s)	Geographic focus (if any)
1.	Reducing Climate Risks to Food Security in Niue through Integrated Community-based Adaptation Measures and Related Institutional Strengthening[144]	The proposed project will strengthen ability of communities and government officers in Niue to make informed decisions and manage likely climate change driven pressures in food-security related sectors, such as agriculture, fisheries and forestry, in an integrated way.	Capacity building; Community-based adaptation	Agriculture; Forestry; Marine fisheries	Niue
			Notes: Submitted to the Adaptation Fund. It was reviewed at the Board November 2010 meeting but not endorsed.[145] *Proposed Budget:* US$$3,465,000 *Proposed Implementing Agency:* United Nations Development Programme		

E. Assessment

A very low level of adaptation action is discernible within Niue, at both the policy and project/program level. Greater effort to understand and prioritize the country's adaptation needs might be appropriate, potentially through completion of the country's Second National Communication. Current initiatives should strengthen the capacity of National Meteorological Services staff to understand, predicate and communicate near and longer term climate forecasts. Through its involvement in the PACC, Niue could also increase its capacity related to agriculture and water concerns. Implementation of the project submitted to the Adaptation Fund would further assist the country in addressing concerns related to key economic sectors. In the future, additional attention may be given to health and gender concerns.

[144] Adaptation Fund, http://adaptation-fund.org/system/files/AFB.PPRC_.2.10%20Proposal%20for%20Niue.pdf
[145] Adaptation Fund, http://www.adaptation-fund.org/sites/default/files/AFB%2011%20Report_0.pdf

References:

Central Intelligence Agency [CIA] (2011). Niue. *The World Factbook*. Retrieved from https://www.cia.gov/library/publications/the-world-factbook/geos/ne.html

Jackson, N.M. (2009). Climate change in Niue: An editorial. Retrieved from http://www.sprep.org/article/news_detail.asp?id=664 .

New Zealand Agency for International Development [NZAID] (no date). Niue–Snapshot. Retrieved from http://www.aid.govt.nz/programmes/c-niue.html

Niue Meteorological Services [NMS] (2000). *Niue Island. Initial Communication under the United Nations Framework Convention on Climate Change*. Retrieved from http://unfccc.int/resource/docs/natc/niunc1.pdf

8.0 Palau

ADB	Asian Development Bank
CIA	Central Intelligence Agency
FSM	Federated States of Micronesia
GEF	Global Environment Facility
NAPA	National Adaptation Programme of Action
PACC	Pacific Islands Adaptation to Climate Change Project
PNG	Papua New Guinea
POERC	Palau Office of Environmental Response and Coordination
SCCF	Special Climate Change Fund
SPA	Strategic Priority for Adaptation (Global Environment Facility)
SPREP	Secretariat to Pacific Regional Environmental Program
UNDP	United Nations Development Programme

The Republic of Palau, an island nation approximately 800 kilometers east of the Philippines, is composed of a group of islands spread over approximately 459 square kilometers of the Pacific Ocean. The economic base is mainly made up of tourism, subsistence agriculture and fishing. The government is a major employer and relies heavily on external funding (CIA, 2011).

A. Adaptation Needs and Priorities

With 1,519 kilometers of coastline (CIA, 2011), Palau has identified its main vulnerabilities due to climate change as being related to: increased drought and storm activity; extreme high tides; sea level rise; coastal erosion; habitat fragmentation; sea surface temperature rise; and coral bleaching (POERC, 2002). In response, Palau has identified a number of potential adaptation actions in the areas of water, agriculture, coastal systems, marine resources, forestry, human health and policy and planning (POERC, 2002):

- *Water:* improved management and maintenance of existing water supply systems is a high priority; centralized water treatment in urban centers; catchment protection and conservation; and drought and flood preparedness strategies.
- *Agriculture:* identify and document the uses, potential uses and preferred growing environment for trees and plant species in order to better enable selection of species suited to a particular physical environment; introduction of salt-tolerant root crops for use in low-lying areas; breeding more drought resistant cultivars and crops for use in drought prone upland areas; introduction

of alternative cultivation practices such as use of irrigation and raised-bed systems; improved soil and water conservation practices; promote use of agroforestry; preservation and dissemination of traditional knowledge; and diversification of subsistence crops.

- *Coastal Systems:* enhance protection of mangrove forest areas and sensitive coral reef systems to help maintain their natural storm and erosion protection capacity while also sustaining their productivity; protection of foreshore resources through re-vegetation and the establishment of setbacks; establishment of sea walls in very specific areas (due to their high costs); and pollution control measures.
- *Marine Resources:* development and extension of marine breeding and restocking programs for both fish and corals; expansion of marine reserves and protected areas; enhanced monitoring and enforcement of marine related legislation; and strengthening the monitoring of migratory fish stocks.
- *Forestry:* expansion of community based forest conservation projects and conservation focused forestry activities.
- *Human Health:* public awareness programs related to malaria, dengue fever and other diseases; and reduction in mosquito breeding sites.
- *Policy and Planning:* develop an overall vulnerability and adaptation strategy that also addresses wider development, social and environmental issues that includes: a national policy framework for adaptation; capacity building and institutional strengthening; public awareness and education; and community-based management.

B. National Level Policies and Strategic Documents

Palau's First National Communication to the United Nations Framework Convention on Climate Change was published in 2002 and outlines the socioeconomic and environmental situation for the country. The vulnerabilities to climate change are outlines, as well as several adaptation strategies (POERC, 2002).

Table 1: Key Government Policies and Reports reflecting Adaptation Needs, Priorities and Planned Actions

Name of Policy Action		Government Division Responsible	Status	Sector(s) of Focus	Summary description
1.	Palau. First National Communication to the United Nations Framework Convention on Climate Change[146]	Palau Office of Environmental Response and Coordination	Released December 2002	Multi-sectoral	This report outlines the socioeconomic and environmental situation for the country. The vulnerabilities to climate change are outlined, as well as

[146] UNFCCC, http://unfccc.int/resource/docs/natc/plwnc1.pdf

Name of Policy Action		Government Division Responsible	Status	Sector(s) of Focus	Summary description
					several adaptation strategies.

C. Current Adaptation Action

There is a low level of current adaptation action in Palau at the project and program level. Actions identified are all at the regional level, including Palau's involvement in three large regional projects that address needs related to policy integration. Ongoing projects address needs in the following sectors: coastal and marine resources, agriculture, water, forestry and tourism. The Asian Development Bank (ADB), Global Environment Facility (GEF), Special Climate Change Fund (SCCF), and the governments of Australia, Canada, Germany, Japan and the United States are active in the implementation of Palau's adaptation projects.

Table 2: Current Adaptation Projects and Programs active in Palau

Name		Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
Participation in Regional and Global Actions								
1.	Pacific Islands Adaptation to Climate Change Project (PACC)[147]	PACC will implement long-term adaptation measures to increase the resilience of a number of key development sectors in the Pacific Islands to the impacts of climate change. This objective will be achieved by focusing on adaptation response strategies, policies and measures to bring about this result. The key development sectors this project will focus on are: 1. water resources management; 2. food production and food security; and 3. coastal zone and associated infrastructure (roads and breakwater). To ensure sustainability of the project, regional and national adaptation financing instruments will constitute a fourth component of the project.	SCCF, co-financing *Budget:* US$59,526,299	UNDP, ADB, SPREP	Capacity building; Policy formation and integration	2008–2012	Agriculture; Coastal zone management; Freshwater supply	*Regional:* Cook Islands, FSM, Fiji, Nauru, Palau, PNG, Solomon Islands, Tonga, Tuvalu, Vanuatu
			In Palau: Demonstrate measures to reduce vulnerability in coastal areas; demonstrate measures to reduce vulnerability in coastal areas.					

[147] GEF, http://www.thegef.org/gef/sites/thegef.org/files/documents/document/09-16-08-SCCF.pdf

Name		Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
2.	Coastal and Marine Resources Management in the Coral Triangle of the Pacific (under the Pacific Alliance for Sustainability Program and the Coral Triangle Initiative)[148]	To promote the conservation and sustainable use of globally significant coastal and marine resources in the Coral Triangle region through the introduction of integrated and ecosystem-based coastal and marine resources management in five Pacific countries. Includes the implementation of pilot adaptation measures to enhance resilience and increase capacity to respond to the adverse impacts of climate change on coastal and marine ecosystems.	GEF-SPA; Japan; Australia; United States *Budget:* US$27,568,183	ADB	Capacity building, Research; Field implementation	2008–2013	Coastal zone management; Marine management	*Regional:* FSM, Fiji, Palau, PNG, Solomon Islands and Vanuatu *Plus:* Timor-Leste
			In Palau: Additional information required.					
3.	Strengthening the Capacity of Pacific Developing Member Countries to Respond to Climate Change (Phase 1)[149]	Incorporation of climate risk management, adaptation practices, and greenhouse gas mitigation measures into infrastructure and key sector investment plans and project designs. Adaptation related actions include: • Pacific Climate Change Program–will assist participating countries to improve their resilience to climate change impacts through (i) mainstreaming of the adaptation in their policies, plans, programs, and projects; and (ii) strengthening their systems and capabilities to foster the adaptation process; and • Adaptation preparation–up to five countries will be supported in preparing the implementation of climate change adaptation plans, including further capacity building	ADB, Canada *Budget:* US$4.965 million	ADB	Capacity building; Policy formation and integration	2009–?	Government	*Regional:* Cook Islands, Fiji, FSM, Kiribati, Marshall Islands, Nauru, Palau, PNG, Samoa, Solomon Islands, Tonga, Tuvalu, Vanuatu. *Plus:* Timor-Leste
			In Palau: Additional information required.					

[148] GEF, http://www.gefonline.org/projectDetailsSQL.cfm?projID=3591
[149] ADB, http://pid.adb.org/pid/TaView.htm?projNo=43071&seqNo=01&typeCd=2#timetable

Name		Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
4.	Coping with Climate Change in the Pacific Island Region[150]	Enhance the competence and capabilities of the local population, the national governmental authorities and regional organizations—SPC and SPREP—in order to cope with the effects of climate change and combat its causes. It includes reviewing policies and integrating adaptation considerations into them, and focuses on the management of land and coastal natural resources, as well as tourism. At the regional level, the program aligns with the Pacific Island Framework for Action on Climate Change 2006–2015. Originally only involving Fiji, Tonga, Vanuatu, the project has been expanded and extended.	German Federal Ministry for Economic Cooperation and Development *Budget:* €17.2 million	GIZ, SPC	Capacity building; Policy formation and integration; Field implementation	2009–2015	Agriculture; Forestry; Tourism	*Regional:* FSM, Fiji, Kiribati, Marshall Islands, Nauru, Palau, PNG, Samoa, Solomon Islands, Tonga, Tuvalu, Vanuatu
			In Palau: Additional information required.					
5.	Asia Pacific Climate Change Adaptation Project Preparation Facility (ADAPT)[151]	Increase access to financial resources for climate change adaptation investment projects; strengthen national human and institutional capacity in preparation of financing proposals; and strengthen regional knowledge platform to share information and processes on climate change projects, funds and best practices to promote replication and scaling up.	USAID *Budget:* US$18.0 million	WWF, Conservation International, the Nature Conservancy, ARD Inc., NOAA	Capacity building; Knowledge communication	2011–2016	Government	*Asia Region:* Bangladesh Cambodia FSM, Fiji, Indonesia, Lao PDR, Malaysia, Nepal, Palau, Philippines, Solomon Islands, Sri Lanka, Thailand, Viet Nam
			In Palau: Additional information required.					

[150] GIZ, http://www.gtz.de/en/weltweit/asien-pazifik/27718.htm and SPC, http://www.spc.int/lrd/index.php?option=com_content&view=article&id=478&Itemid=44

[151] USDS, http://www.state.gov/documents/organization/151686.pdf

D. Proposed Adaptation Action

Palau has submitted a project to the SCCF for consideration. The project will address needs related to agriculture, tourism, water resources and infrastructure.

Table 3: Proposed Adaptation Projects and Programs in Palau

Name		Objectives	Type of project	Priority Sector(s)	Geographic focus (if any)
1.	Adaptation Cluster: A framework to support climate change adaptation measures and investments for agriculture, tourism, water resources and infrastructure[152]		Capacity building	Agriculture; Tourism; Freshwater supply	Palau
			Notes: Proposed to the SCCF = $6,000,000 Proposed co-fin = $23,500,000		

E. Assessment

Through its National Communication released in 2002, Palau noted its needs in the areas of water, agriculture, coastal systems, marine resources, forestry, human health and policy and planning. The current and planned adaptation projects in the country should assist it in addressing vulnerabilities in some of these areas, particularly water, agriculture and coastal systems. Areas in which consideration might be given to greater action include forestry and human health (if needs in these areas are not being address through other sustainable development activities). Furthermore, gender considerations are not a prominent component of any current adaptation project or proposed strategy. The level of policy development in the country is also limited; the completion of a dedicated climate change adaptation strategy may be appropriate.

References

Central Intelligence Agency [CIA] (2011). Palau. *The World Factbook*. Retrieved from https://www.cia.gov/library/publications/the-world-factbook/geos/ps.html

Palau Office of Environmental Response and Coordination [POERC] (2002). *Palau. First National Communication to the United Nations Framework Convention on Climate Change*. Retrieved from https://www.cia.gov/library/publications/the-world-factbook/geos/ps.html

[152] GEF, http://www.thegef.org/gef/sites/thegef.org/files/publication/adaptation-actions_0.pdf

9.0 Papua New Guinea

ADB	Asian Development Bank
AusAID	Australian Agency for International Development
CIA	Central Intelligence Agency
FSM	Federated States of Micronesia
GEF	Global Environment Facility
GFDRR	Global Facility for Disaster Reduction and Recovery
MEC	Ministry of the Environment and Conservation
NOAA	National Oceanic and Atmospheric Administration (United States)
PACC	Pacific Islands Adaptation to Climate Change Project
PNG	Papua New Guinea
PPCR	Pilot Program for Climate Resilience
SCCF	Special Climate Change Fund
SPA	Strategic Priority for Adaptation (Global Environment Facility)
SPREP	Secretariat to Pacific Regional Environmental Program
UNDP	United Nations Development Programme

The Independent State of Papua New Guinea occupies the eastern half of the island of New Guinea[153] as well as numerous offshore islands. With a land area of 462,840 square kilometers and a population of over 6.1 million, Papua New Guinea is the largest country in the Pacific region both by geography and population. It has an abundance of natural resources, with mineral deposits like copper, gold and oil accounting for nearly two-thirds of Papua New Guinea's export revenues. Still, 85 per cent of the population relies on subsistence agriculture (CIA, 2011).

A. Adaptation Needs and Priorities

The main sources of climate change vulnerabilities identified by Papua New Guinea (MEC, 2000) are:

[153] The western half of New Guinea forms part of Indonesia.

- *Coastal and Marine Environments:* due to the potential for sea level rise, bleaching of corals, loss of wetlands, loss of freshwater (through seawater intrusion), and changes in the abundance and health of marine resources.
- *Human Health:* potential for severe storms, drought, declines in water resources, impacts on agricultural resources, and an increase in vector-borne and other diseases (including malaria).
- *Agriculture and Land Use Change:* potential for unsustainable forestry and the monsoon season may create more landslides and/or degradation of soils if storms occur with more frequency, climate variability to affect crop production, and enable declines in soil fertility.

A number of adaptation priorities have been identified to reduce vulnerabilty to these anticipated impacts. These needs mainly focus on the integration of sustainable development practices into natural resource extraction (MEC, 2000).

B. National Level Policies and Strategic Documents

Papua New Guinea released its Initial National Communication to the United Nations Framework Convention on Climate Change in 2000 (MEC, 2000). Subsequent policy related initiatives, such as efforts to integrating adaptation into sectoral policies and planning processes and/or the establishment of a national adaptation strategy, have not been identified.

Table 1: Key Government Policies and Reports reflecting Adaptation Needs, Priorities and Planned Actions

Name of Policy Action		Government Division Responsible	Status	Sector(s) of Focus	Summary description
1.	Papua New Guinea Initial National Communication Under the United Nations Framework Convention on Climate Change[154]	Ministry of the Environment and Conservation	Released November 2000	Multi-sectoral	This document provides an overview of the socioeconomic and environmental situation of the country. Main climate change concerns identified are extreme weather events (drought) and the degradation and erosion of coastal areas. It also identifies as number of potential adaptation strategies.

C. Current Adaptation Action

There are is a high number of adaptation projects and programs underway in Papua New Guinea relative to other countries in the region. While most of these projects involve multiple countries, a current initiative being executed exclusively within Papua New Guinea focuses on disaster risk management in the agriculture and transport sectors. These projects are addressing needs related to a variety of sectors, with a greater number of projects focusing on agriculture, disaster risk reduction, and coastal zone management; most have a

[154] UNFCCC, http://unfccc.int/resource/docs/natc/papnc1.pdf

clear focus on capacity building. The majority current projects in Papua New Guinea are funded by the Asian Development Bank (ADB), the Australian Agency for International Development (AusAID) and the United States.

Table 2: Current Adaptation Projects and Programs active in Papua New Guinea

Name		Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
National Action								
1.	Papua New Guinea Disaster Risk Management and Climate Adaptation Program[155]	This project will concentrate on disaster risk management in the agriculture and transport sectors. The following activities will take place: • Agriculture: assessment of climate change and disaster risks; feasibility study for agriculture risk insurance for smallholder farmers; emergency response plan; crop selection; and strengthening rural agriculture networks. • Transport sector: integrated hazard risk information and mapping; capacity building; research; risk assessment; pilot mitigation measures.	GFDRR *Budget*: US$1,873,200		Capacity building; Field implementation	2011–2014	Disaster risk management; Agriculture; Transportation	Papua New Guinea
Participation in Regional and Global Actions								
2.	Pacific Islands Climate Prediction Project[156]	The project aimed to expand understanding of how seasonal climate prediction services can be applied to support climate-sensitive decision making and the use of climate predictions by National Meteorological Services and industries/agencies which use climate information (e.g. farmers, tourism, water resource managers and health authorities). Along with the provision of software tailored to local circumstances and	AusAID *Budget:* AU$3.0 million	Australia Bureau of Meteorology	Research; Capacity building	Phase I: 2004–2006 Phase II: 2007–2009 (*completed*)	Climate information services	*Regional:* Cook Islands, Fiji, Kiribati, Niue, PNG, Samoa, Solomon Islands, Tonga, Tuvalu, Vanuatu

[155] GFDRR, http://gfdrr.org/gfdrr/ca_projects/detail/3686
[156] BOM, http://www.bom.gov.au/climate/pi-cpp/ and ALM, http://www.adaptationlearning.net/project/pacific-islands-climate-predictions-project-pi-cpp

Name		Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
		training in the effective use of climate predictions in a risk management context, the project undertook specific pilot activities.	*In Papua New Guinea:* Climatic forecasting with emphasis on rainfall and tropical cyclones. Participated in the pilot projects "Climate and Oceanographic Variability and their Impacts on Fisheries"[157] completed in 2005 and "Application of Climate Forecasts for Improved Management of Drought and Crop Production (Sweet Potato) in Papua New Guinea."[158]					
3.	Regional Partnerships for Climate Change Adaptation and Disaster Preparedness[159]	The outcome is expected to be a strengthened information system that will support informed decision-making aimed at minimizing the negative social and environmental impacts of catastrophic events. It will also mitigate the financial risk of participating Pacific developing member countries to the effects of natural disasters, including those exacerbated by human-induced climate change. This work is linked to the World Bank's work on the development of a Caribbean Catastrophe Insurance Facility for the Pacific.	ADB *Budget:* US$1.0 million	World Bank	Capacity building	Phase 1: 2007–2011	Disaster risk management	*Regional:* Cook Islands, Fiji, PNG, Samoa, Solomon Islands, Tonga, Tuvalu, and Vanuatu
			In Papua New Guinea: Data gathering for country-specific risk models to be developed. These models will be used to assess the feasibility of catastrophe risk financing and insurance options.[160]					
4.	Pilot Program for Climate Resilience (PPCR) [161]	PPCR aims to pilot and demonstrate ways in which climate risk and resilience may be integrated into core development planning and implementation in a way that is consistent with poverty reduction and sustainable development goals. In this way, the PPCR provides incentives for scaled-up action and initiates transformational change. The pilot programs and projects implemented under the PPCR are country-	World Bank's Strategic Climate Fund *Budget:* US$971.75 million pledged as of February 2011	World Bank	Policy formation and integration	2008–?	Multi-sectoral	*Regional Programs:* Caribbean and Pacific *Country programs:* Bangladesh, Bolivia, Cambodia,

[157] BOM, http://www.bom.gov.au/climate/pi-cpp/pilot_projects/fisheries_guide.shtml
[158] BOM, http://www.bom.gov.au/climate/pi-cpp/pilot_projects/agriculture_png.shtml
[159] ADB, http://www.adb.org/Projects/project.asp?id=41187
[160] ADB, http://www.adb.org/Documents/TARs/REG/41187-REG-TAR.pdf
[161] Climate Fund Update, http://www.climatefundsupdate.org/listing/pilot-program-for-climate-resilience

Name		Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
		led, build on NAPAs and other relevant country studies and strategies. Pacific participation includes Papua New Guinea, Samoa, Tonga.						Mozambique, Nepal, Niger, Tajikistan, Yemen, Zambia
			In Papua New Guinea: additional information required.					
5.	Pacific Islands Adaptation to Climate Change Project (PACC)[162]	PACC will implement long-term adaptation measures to increase the resilience of a number of key development sectors in the Pacific Islands to the impacts of climate change. This objective will be achieved by focusing on adaptation response strategies, policies and measures to bring about this result. The key development sectors this project will focus on are: 1. water resources management; 2. food production and food security; and 3. coastal zone and associated infrastructure (roads and breakwater). To ensure sustainability of the project, regional and national adaptation financing instruments will constitute a fourth component of the project.	SCCF, co-financing *Budget:* US$59,526,299	UNDP, ADB, SPREP	Capacity building; Policy formation and integration	2008–2012	Agriculture; Coastal zone management; Freshwater supply	*Regional:* Cook Islands, FSM, Fiji, Nauru, Palau, PNG, Solomon Islands, Tonga, Tuvalu, Vanuatu
			In Papua New Guinea: Demonstration measure to reduce vulnerability in coastal area and crop production. The institutional and socioeconomic adaptive capacity will be evaluated using legislation, policies and capacity assessments. Developing an integrated assessment of the vulnerability of the biodiversity of the region to climate change.					
6.	U.S. Support Program to the Coral Triangle Initiative (CTI)[163]	To improve the management of biologically and economically important coastal and marine resources and associated ecosystems that support livlihoods and economies in the Coral Triangle and assist the six CTI countries in implementing the CTI Regional and National Plans of Action with activities that focus on instituting an ecosystem approach	USAID *Budget:* US$41 million	WWF, Conservation International, the Nature Conservancy, ARD Inc., NOAA	Capacity building; Assessment; Field implementation	2008–2013	Marine management	*Asia-Pacific:* Indonesia, Malaysia, Philippines, Papua New Guinea, Solomon Islands,

[162]GEF, http://www.thegef.org/gef/sites/thegef.org/files/documents/document/09-16-08-SCCF.pdf
[163] CTI, http://www.uscti.org/uscti/default.aspx

Name		Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
		to fisheries management, creating marine protected areas, building climate change adaptive capacity and establishing regional platforms to promote cross-country learning and enhance sustainability.						Timor-Leste
			In Papua New Guinea: additional information required.					
7.	Coastal and Marine Resources Management in the Coral Triangle of the Pacific (under the Pacific Alliance for Sustainability Program and the Coral Triangle Initiative)[164]	To promote the conservation and sustainable use of globally significant coastal and marine resources in the Coral Triangle region through the introduction of integrated and ecosystem-based coastal and marine resources management in five Pacific countries. Includes the implementation of pilot adaptation measures to enhance resilience and increase capacity to respond to the adverse impacts of climate change on coastal and marine ecosystems.	GEF-SPA; Japan; Australia; United States *Budget:* US$27,568,183	ADB	Capacity building, Research; Field implementation	2008–2013	Coastal zone management; Marine management	*Regional:* FSM, Fiji, Palau, PNG, Solomon Islands and Vanuatu *Plus:* Timor-Leste
			In Papua New Guinea: additional information required.					
8.	Strengthening the Capacity of Pacific Developing Member Countries to Respond to Climate Change (Phase 1)[165]	Incorporation of climate risk management, adaptation practices, and greenhouse gas mitigation measures into infrastructure and key sector investment plans and project designs. Adaptation related actions include: • Pacific Climate Change Program–will assist participating countries to improve their resilience to climate change impacts through (i) mainstreaming of the adaptation in their policies, plans, programs, and projects; and (ii) strengthening their systems and capabilities to foster the adaptation process; and	ADB, Canada *Budget:* US$4.965 million	ADB	Capacity building; Policy formation and integration	2009–?	Government	*Regional:* Cook Islands, Fiji, FSM, Kiribati, Marshall Islands, Nauru, Palau, PNG, Samoa, Solomon Islands, Tonga, Tuvalu, Vanuatu. *Plus:* Timor-Leste

[164] GEF, http://www.gefonline.org/projectDetailsSQL.cfm?projID=3591
[165] ADB, http://pid.adb.org/pid/TaView.htm?projNo=43071&seqNo=01&typeCd=2#timetable

Name		Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
		• Adaptation preparation–up to five countries will be supported in preparing the implementation of climate change adaptation plans, including further capacity building	*In Papua New Guinea:* Additional information needed					
9.	Seeds for Needs[166]	Project to pre-select crops and varieties that will likely perform well under future conditions.	World Bank	Biodiversity International	Community based adaptation; Research	2009–?	Agriculture	*Global:* Ethiopia, Papua New Guinea
			In Papua New Guinea: Additional information needed					
10.	Coping with Climate Change in the Pacific Island Region[167]	Enhance the competence and capabilities of the local population, the national governmental authorities and regional organizations—SPC and SPREP—in order to cope with the effects of climate change and combat its causes. It includes reviewing policies and integrating adaptation considerations into them, and focuses on the management of land and coastal natural resources, as well as tourism. At the regional level, the program aligns with the Pacific Island Framework for Action on Climate Change 2006–2015. Originally only involving Fiji, Tonga, Vanuatu, the project has been expanded and extended.	German Federal Ministry for Economic Cooperation and Development *Budget:* €17.2 million	GIZ, SPC	Capacity building; Policy formation and integration; Field implementation	2009–2015	Agriculture; Forestry; Tourism	*Regional:* FSM, Fiji, Kiribati, Marshall Islands, Nauru, Palau, PNG, Samoa, Solomon Islands, Tonga, Tuvalu, Vanuatu
			In Papua New Guinea: The project is "working with gene banks and local partners, including communities and women's groups, to identify sweet potato and taro varieties that can withstand extremes of temperature and rainfall as well as differences in the salt content of the soil and predicted shifts in pests and diseases. The pre-selected varieties will then be matched with places where they should continue to produce good yields under predicted future conditions."					
11.	Cities and Climate Change	This initiative aims to strengthen the climate	UN-Habitat	Local	Capacity	2010–?	Urban areas	*Asia Pacific:*

[166] Biodiversity International, http://www.bioversityinternational.org/announcements/seeds_for_needs.html
[167] GIZ, http://www.gtz.de/en/weltweit/asien-pazifik/27718.htm and SPC, http://www.spc.int/lrd/index.php?option=com_content&view=article&id=478&Itemid=44

Name		Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
	Initiative Asia Pacific[168]	change response of cities and local governments. The main objectives are to: promote active climate change collaboration between local governments and associations; to enhance policy dialogue on climate change; to support local governments in preparing climate action plans; and to foster awareness, education and capacity building.	*Budget:* US$10 million	governments, universities	building; Knowledge communication; Policy formation and integration			China, Fiji, Indonesia, Mongolia, Nepal, Papua New Guinea, Samoa, Sri Lanka, Vanuatu and Viet Nam
			In Papua New Guinea: Review of current building codes; capacity building of local governments; mitigation measures to reduce land erosion and solid waste management; and education awareness.[169]					

D. Proposed Adaptation Action

Papua New Guinea has developed projects for future implementation that have been submitted to the Special Climate Change Fund (SCCF) and the Adaptation Fund for consideration. These projects will focus on marine resources management, disaster risk reduction and agriculture.

Table 3: Proposed Adaptation Projects and Programs in Papua New Guinea

Name		Objectives	Type of project	Priority Sector(s)	Geographic focus (if any)
1.	Adaptation in the Coral Triangle (ACT)			Marine management	Malaysia, Papua New Guinea, Philippines, Solomon Islands, Timor-Leste
			Notes: Proposed to the SCCF = US$20 million; Proposed co-fin = US$290 million		
2.	Enhancing Adaptive Capacity of Communities to Climate	"The overall objective is to strengthen the ability of communities in Papua New Guinea to make informed	Capacity building; Knowledge	Agriculture; Disaster risk management ;	North Coast and Islands Region

[168] CCCI, http://www.fukuoka.unhabitat.org/programmes/ccci/index_en.html
[169] UN-Habitat, http://www.fukuoka.unhabitat.org/programmes/ccci/pdf/Port_Moresby_city_flyer_May10.pdf

Name		Objectives	Type of project	Priority Sector(s)	Geographic focus (if any)
	Change-Related Floods in the North Coast and Islands Region of Papua New Guinea[170]	decisions about and adapt to climate change-driven hazards affecting both coastal and riverine communities. In particular, the program will focus on resilience towards occurrences of coastal and inland flooding events." The project concentrates on following areas: • Adaptation measures in coastal and riverine communities; • Institutional strengthening; and • Awareness raising and knowledge management.	communication	Coastal zone management	
			Notes: Submitted to the Adaptation Fund Board. Concept approved at June 2011 meeting.[171] *Planned Implementing Agency:* UNDP *Planned budget:* US$5,227,530 *Planned timeline:* 2011–2015		

E. Assessment

Papua New Guinea is in a unique situation compared to other Pacific Islands, as it has a large land and natural resources base. It also has a relatively high number of adaptation projects underway, largely through its participation in various regional projects and programs. These ongoing initiatives address the concerns identified by Papua New Guinea with respect to coastal and marine resources, agriculture and land use (including forestry). Concerns related to human health do not appear to be addressed through current initiatives. Nor do any current adaptation projects or proposed strategies specifically identify gender considerations as a prominent component. Finally, given that a decade has passed since Papua New Guinea identified its vulnerabilities and adaptation needs through its Initial National Communication, a new assessment that takes into account knowledge gained and adaptation efforts completed would assist in better meeting its adaptation requirements.

References:

Central Intelligence Agency [CIA] (2011). Papua New Guinea. *The World Factbook*. Retrieved from https://www.cia.gov/library/publications/the-world-factbook/geos/pp.html

Ministry of the Environment and Conservation [MEC] (2000). *Papua New Guinea Initial National Communication under the United Nations Framework Convention on Climate Change*. Retrieved from http://unfccc.int/resource/docs/natc/papnc1.pdf

[170] Adaptation Fund, http://www.adaptation-fund.org/sites/default/files/AFB.PPRC_.5.12%20Proposal%20for%20PNG_1.pdf
[171] Adaptation Fund, http://adaptation-fund.org/sites/default/files/AFB14_Report_English.pdf

10. Samoa

ADB	Asian Development Bank
AusAID	Australian Agency of International Development
CBA	community based adaptation
CIA	Central Intelligence Agency
DCCEE	Department of Climate Change and Energy Efficiency (Australia)
FSM	Federated States of Micronesia
GEF	Global Environment Facility
IUCN	International Union of Conservation of Nature
LDCF	Least Developed Country Fund
MNREM	Ministry of Natural Resources, Environment and Metorology (Samoa)
NAPA	National Adaptation Programme of Action
NCCCT	National Climate Change Country Team (Samoa)
NMFA	Netherlands Ministry of Foreign Affairs
PNG	Papua New Guinea
SCCF	Special Climate Change Fund
SPREP	Secretariat for the Pacific Regional Environmental Program
SWA	Samoa Water Authority
UNDP	United Nations Development Programme
UNFCCC	United Nations Framework Convention on Climate Change
UNOPS	United Nations Office of Project Services

The Independent State of Samoa is a group of two main islands, Savai'i and Upolu, as well as several smaller islands lying in the Polynesia region of the southern Pacific Ocean. Its total area is approximately 2,931 square kilometers, with a coastline of about 403 kilometers. Approximately 193,000 people live in Samoa (CIA, 2011). Like other small tropical islands, Samoa's has high temperatures, rainfall and humidity throughout most of the year. Only the northwestern (leeward) sides of the main islands experience distinct wet and dry season (NCCCT, 1999). Samoa's economy is based on subsistence and commercial agriculture and fishing, and a growing tourism

industry. There are also several food processing and automobile parts plants. However, the country remains somewhat dependent on financial aid (CIA, 2011).

A. Adaptation Needs and Priorities

Samoa's main concerns related to climate change are the potential implications of a change in the frequency and/or intensity of extreme weather events, coastal erosion and sea level rise.[172] The islands are presently exposed to severe tropical cyclones that typically occur between December and February (NCCCT, 1999); Cyclone Ofa (1990) and Cyclone Val (1991), for example, caused massive damage to Samoa's infrastructure, natural vegetation, crops and plantations (NMFA et al., 2010), resulting in economic costs equivalent to about three times the country's Gross National Product (NCCCT, 1999). These vulnerabilities in part reflect the fact that about 70 per cent the country's infrastructure and human settlements are located close to its coastline. Long dry periods associated with the El Nino Southern Oscillation are also a concern (NCCCT, 1999).

In its Initial National Communication to the United Nations Framework Convention on Climate Change (UNFCCC), Samoa examined five primary areas of vulnerability to climate change: agriculture, human health, biodiversity, coastal environments and water. The agricultural sector, it was noted, might have to adapt to greater variability in weather and soil conditions, as well as a possible increase in pests and disease. Human health was identified as a concern because of the possible (but not understood) impact of climate change on several common fatal vector- and water-borne diseases such as dengue fever, gastroenteritis and diarrhea. Biodiversity was an additional concern as islanders have long depended on natural resources to support their livelihood activities. As biodiversity is likely to be affected by extreme weather events and human activities, Samoa expressed a desire for more research to be undertaken on how it can prepare to adapt to extreme weather events and a possible increase in pests/disease. Coastal environments, in addition to be potentially being exposed to changes in the pattern of extreme weather events, could also experience greater erosion, the retreat of beaches and marshlands, and flooding of low-lying areas due to sea level rise. Currently, there is an abundance of water resources for Samoans, but the sector is vulnerable to deforestation, droughts and turbidity of surface waters. As temperatures rise, adaptation needs in the water sector were expected to become more important (NCCCT, 1999).

More recently, Samoa's National Adaptation Programme of Action (NAPA) identifies urgent and immediate needs with respect to adaptation, with its top three being:

[172] Research completed through the South Pacific Sea Level and Climate Monitoring Project, which has collected information in Samoa since 1993, suggests that sea levels in Apia, the capital of Samoa, were rising at a rate of 4.9 millimeters per year as of 2008. A linear projection suggests that sea levels in this location would rise by 53 centimeters by 2100 relative to 1990 levels (NMFA et al., 2010).

1) Water resources;
2) Reforestation programs and activities; and
3) Education and awareness programs.

The main priority criteria for implementation of programs in these areas was identified as being ensuring that they are country-driven, local and community-based (MNREM, 2005). Specific adaptation actions recommended in Samoa's NAPA are provided in Table 3.

B. National Level Policies and Strategic Documents

Samoa released its First National Communication in 1999, which outlines the socioeconomic and environmental status of Samoa and describes several possible adaptation actions for each of the priority sectors identified (NCCCT, 1999). Its adaptation needs and priorities were further elaborated in its 2005 NAPA (MNREM, 2005). Samoa has also established the Samoa National Climate Change Country Team, which is composed primarily of government representatives but also includes members of civil society (NMFA et al., 2010).

As well, climate change concerns have been acknowledged in Samoa's *Strategy for the Development of Samoa (2008-12)*. This strategy identifies national priorities related to key development sectors and guides all development activities in the country. Of the seven goals identified in the 2008-12 Strategy, climate change adaptation is integrated into Goal 7, "Environmental Sustainability and Disaster Risk Reduction." As in the NAPA, the Strategy highlights the potential for greater risk of natural disasters due to climate change and deforestation. The strategy highlights the need to implement the Disaster Management Act of 2007 and to further address the vulnerability of coastal communities (NMFA et al., 2010).

Table 1: Key Government Policies and Reports reflecting Adaptation Needs, Priorities and Planned Actions

Name of Policy Action		Government Division Responsible	Status	Sector(s) of Focus	Summary description
1.	First National Communication to the UNFCCC[173]	Samoa's National Climate Change Country Team	Released 1999	Multi-sectoral	This document provides a baseline description of the socioeconomic and environmental status of the country. The greenhouse gas emissions were collected and shown that the amount of emissions is globally insignificant. The main vulnerabilities to climate change are outlined; sea level rise and extreme weather events are the most significant. Several adaptation strategies are briefly discussed.

[173] UNFCCC, http://unfccc.int/resource/docs/natc/samnc1.pdf

Name of Policy Action		Government Division Responsible	Status	Sector(s) of Focus	Summary description
2.	National Adaptation Programme of Action Samoa[174]	Ministry of Natural Resources, Environment and Meteorology	Released December 2005	Multi-sectoral	This document outlines the national situation, and the major adaptation concerns of Samoa. The national adaptation programs that have been, or are to be implemented in order to cope with the impacts of climate change are described in detail. There is a need for capacity building that is apparent throughout the document.
3.	Strategy for the Development of Samoa (2008–2012)[175]	Ministry of Finance	Released May 2008	Multi-sectoral	Sets for the framework for development in Samoa between 2008 and 2012. Of its seven goals, the need to adapt to the impacts of climate change is identified in Goal 7: "Environmental Sustainability and Disaster Risk Reduction."

C. Current Adaptation Action

Relative to other Pacific Island countries, a very high number of climate change adaptation projects—national, regional and global—are presently underway in Samoa. Most of these projects focus on forestry and agriculture, but also address coastal zone management, human health, meteorological capacity, infrastructure, water and policy and planning. There are a variety of funding agencies active in the country, with the most common being the Asian Development Bank (ADB), the World Bank and the governments of Australia and Germany. Samoa also has received funding for two projects through the Least Developed Countries Fund (LDCF) that address priority actions identified in its NAPA.

Table 2: Current adaptation projects and programs active in Samoa

Name		Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
National Action								
1.	Integrating Climate Change Risks into the Agriculture	To increase the resilience and adaptive capacity of coastal communities in Samoa to	LDCF; co-financing	UNDP, Ministry of Natural	Capacity building	2009–2012	Agriculture; Human health	Samoa

[174] UNFCCC, http://unfccc.int/resource/docs/napa/sam01.pdf
[175] SPREP, http://www.sprep.org/att/IRC/eCOPIES/Countries/Samoa/104.pdf

Name		Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
	and Health Sectors in Samoa[176]	the adverse impacts of on agricultural production and public health.	*Budget:* US$ 4.10 million	Resources and Environment, Ministry of Health, National Health Services and Ministry of Agriculture and Fisheries				
2.	Samoa-Australia Partnership for Development: Climate change[177]	Australia is supporting the Government of Samoa to implement activities under Samoa's NAPA, primarily in the water, forest and tourism sectors. This includes a national tourism adaptation strategy setting out adaptation standards for tourism services (e.g. to manage surface floods in the capital Apia) and a national strategy for forest fire prevention.	AusAID *Budget:* US$ 4 million	Government of Samoa	Field implementation; Policy implementation	2009–2013	Forestry; Tourism; Freshwater supply	Samoa
3.	Samoans Turn to Traditional Housing as Sanctuary from Climate Risks[178]	To recover indigenous cultural knowledge held by Samoan elders about housing and climate, and to apply this to the design and construction practices of Samoan indigenous housing in order to inform the development of safer, accessible, resilient, and sustainable housing. To put indigenous knowledge into practice through the construction of three model Samoan houses (Fale) in three coastal sites. To reinvigorate village-based teaching and practice of growing materials, crafting,	World Bank *Budget:* US$199,000	Afeafe o Vaetoefaga Pacific Academy of Cultural Restoration, Research and Development	Capacity building; Knowledge communications	2010	Buildings	Apia

[176] GEF, http://gefonline.org/projectDetailsSQL.cfm?projID=3358; Adaptation Learning Mechanism, http://www.adaptationlearning.net/project/integrating-climate-change-risks-agriculture-and-health-sectors-samoa and http://www.adaptationlearning.net/sites/default/files/Samoa%20ICCRAHS_6May11.pdf
[177] AusAID, http://www.ausaid.gov.au/country/cbrief.cfm?DCon=9205_8231_8940_8250_1457&CountryID=18&Region=SouthPacific
[178] World Bank, http://wbi.worldbank.org/developmentmarketplace/idea/samoans-turn-traditional-housing-sanctuary-climate-risks

Name		Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
		and constructing indigenous Samoan housing. To engage three village communities in a public education program about climate risk and developing risk management plans for the hazards that they will face.						
4.	Integration of Climate Change Risk and Resilience into Forestry Management[179]	The objective of the project is to increase the resilience and adaptive capacity of Samoa's forest areas and the communities dependent on them for livelihoods to the threat of climate change through targeted adaptation interventions in (i) lowland agro-forestry and (ii) upland native forest sub-sectors.	LDCF; co-financing *Budget:* US$ 4,850,000	UNDP, Ministry of Natural Resources and Environment, Ministry of Agriculture and Fisheries	Capacity building; Field implementation	2011–2014	Forestry	Samoa
Participation in Regional and Global Actions								
5.	Pacific Islands Climate Prediction Project[180]	The project aimed to expand understanding of how seasonal climate prediction services can be applied to support climate-sensitive decision making and the use of climate predictions by National Meteorological Services and industries/agencies which use climate information (e.g. farmers, tourism, water resource managers and health authorities). Along with the provision of software tailored to local circumstances and training in the effective use of climate predictions in a risk management context, the project undertook specific pilot activities.	AusAID *Budget:* AU$3.0 million	Australia Bureau of Meteorology	Research; Capacity building	Phase I: 2004–2006 Phase II: 2007–2009 (*completed*)	Climate information services	*Regional:* Cook Islands, Fiji, Kiribati, Niue, PNG, Samoa, Solomon Islands, Tonga, Tuvalu, Vanuatu
			In Samoa: A new building for the Samoa Meteorological Services department, training workshops and technical support. Climate forecasting with an emphasis on temperature, rainfall and tropical cyclone prediction.[181] Participated in the pilot projects "Climate and Oceanographic Variability and their Impacts on Fisheries"[182] completed in 2005 and					

[179] GEF, http://www.gefonline.org/projectDetailsSQL.cfm?projID=4216
[180] BOM, http://www.bom.gov.au/climate/pi-cpp/ and ALM, http://www.adaptationlearning.net/project/pacific-islands-climate-predictions-project-pi-cpp
[181] BOM, http://www.bom.gov.au/climate/pi-cpp/wsm.shtml
[182] BOM, http://www.bom.gov.au/climate/pi-cpp/pilot_projects/fisheries_guide.shtml

Name		Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
			"Application of Climate Forecasting for Improved Management of Hydropower Production in the Pacific Islands–Samoa."[183]					
6.	Regional Partnerships for Climate Change Adaptation and Disaster Preparedness[184]	The outcome is expected to be a strengthened information system that will support informed decision-making aimed at minimizing the negative social and environmental impacts of catastrophic events. It will also mitigate the financial risk of participating Pacific developing member countries to the effects of natural disasters, including those exacerbated by human-induced climate change. This work is linked to the World Bank's work on the development of a Caribbean Catastrophe Insurance Facility for the Pacific.	ADB *Budget:* US$1.0 million	World Bank	Capacity building	Phase 1: 2007–2011	Disaster risk management	*Regional:* Cook Islands, Fiji, PNG, Samoa, Solomon Islands, Tonga, Tuvalu, and Vanuatu
			In Samoa: Data gathering for country-specific risk models to be developed. These models will be used to assess the feasibility of catastrophe risk financing and insurance options.[185]					
7.	Pilot Program for Climate Resilience (PPCR) [186]	PPCR aims to pilot and demonstrate ways in which climate risk and resilience may be integrated into core development planning and implementation in a way that is consistent with poverty reduction and sustainable development goals. In this way, the PPCR provides incentives for scaled-up action and initiates transformational change. The pilot programs and projects implemented under the PPCR are country-led, build on NAPAs and other relevant country studies and strategies. Pacific participation includes Papua New Guinea,	World Bank's Strategic Climate Fund *Budget:* US$971.75 million pledged as of February 2011	World Bank	Policy formation and integration	2008–?	Multi-sectoral	*Regional Programs:* Caribbean and Pacific *Country programs:* Bangladesh, Bolivia, Cambodia, Mozambique, Nepal, Niger, Tajikistan, Yemen,

[183] BOM, http://www.bom.gov.au/climate/pi-cpp/pilot_projects/energy.shtml
[184] ADB, http://www.adb.org/Projects/project.asp?id=41187
[185] ADB, http://www.adb.org/Documents/TARs/REG/41187-REG-TAR.pdf
[186] Climate Fund Update, http://www.climatefundsupdate.org/listing/pilot-program-for-climate-resilience

Name		Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
		Samoa and Tonga.						Zambia
			In Samoa: Two projects have been initiated under the PPRC specifically in Samoa: • "Project Preparation Grant for Enhancing the Climate Resilience of the West Coast Road." Funding in the amount of US$200,000 was granted in March 2011 • "Project Preparation Grant for Enhancing the Climate Resilience of Coastal Resources and Communities." Grant proposal funding in the amount of US$400,000 approved in March 2011.[187]					
8.	Economics of Adaptation to Climate Change[188]	The two specific objectives of the study were: (1) to develop a global estimate of adaptation costs to inform the international community's efforts to tailor support and provide new and additional resources to help vulnerable developing countries meet adaptation costs; and (2) to support decision makers in developing countries to better evaluate and assess the risks posed by climate change and to better design strategies to adapt to climate change.	Netherlands, Switzerland and the United Kingdom	World Bank	Research; Policy formation and integration	2008–2010	Multi-sectoral	*Global:* Bangladesh, Bolivia, Ethiopia, Ghana, Mozambique, Samoa and Viet Nam
			In Samoa: Research project to understand the effects of two climate change scenarios on Samoa's infrastructure, human health (malaria) and forestry sectors. Outcomes of the project are accessible here: http://climatechange.worldbank.org/content/country-case-studies-economics-adaptation-climate-change					
9.	Vulnerability and Adaptation Initiative[189]	Through this initiative, six Pacific countries have implemented activities to reduce their vulnerability to climate change and achieve good environmental outcomes. The Initiative has funded activities such as the replanting of coastal mangroves to protect shorelines, the construction of rain water tanks in islands affected by seasonal drought, the trialing of versatile crop varieties and the recording of traditional knowledge about	AusAID		Field implementation; Capacity building	2008–2012	Multi-sectoral	*Regional:* Fiji, Samoa, Solomon Islands, Tonga, Tuvalu and Vanuatu
			In Samoa: Additional information required.					

[187] Climate Investment Fund, http://www.climateinvestmentfunds.org/cifnet/?q=country-program-info/samoas-ppcr-programming
[188] World Bank, http://climatechange.worldbank.org/content/economics-adaptation-climate-change-study-homepage
[189] AusAID, http://www.ausaid.gov.au/country/pacific/climate_change.cfm

Name		Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
		disaster preparation.						
10.	Pacific Islands Adaptation to Climate Change Project (PACC)[190]	PACC will implement long-term adaptation measures to increase the resilience of a number of key development sectors in the Pacific Islands to the impacts of climate change. This objective will be achieved by focusing on adaptation response strategies, policies and measures to bring about this result. The key development sectors this project will focus on are: 1. water resources management; 2. food production and food security; and 3. coastal zone and associated infrastructure (roads and breakwater). To ensure sustainability of the project, regional and national adaptation financing instruments will constitute a fourth component of the project.	SCCF, co-financing *Budget:* US$59,526,299	UNDP, ADB, SPREP	Capacity building; Policy formation and integration	2008–2012	Agriculture; Coastal zone management; Freshwater supply	*Regional:* Cook Islands, FSM, Fiji, Marshall Islands, Nauru, Niue, Palau, Papua New Guinea, Samoa, Solomon Islands, Tonga, Tuvalu, Vanuatu
			In Samoa: Additional information required.					
11.	Strengthening the Capacity of Pacific Developing Member Countries to Respond to Climate Change (Phase 1)[191]	Incorporation of climate risk management, adaptation practices, and greenhouse gas mitigation measures into infrastructure and key sector investment plans and project designs. Adaptation related actions include: • Pacific Climate Change Program–will assist participating countries to improve their resilience to climate change impacts through (i) mainstreaming of the adaptation in their policies, plans, programs, and projects; and (ii) strengthening their systems and capabilities to foster the adaptation	ADB, Canada *Budget:* US$4.965 million	ADB	Capacity building; Policy formation and integration	2009–?	Government	*Regional:* Cook Islands, Fiji, FSM, Kiribati, Marshall Islands, Nauru, Palau, PNG, Samoa, Solomon Islands, Tonga, Tuvalu, Vanuatu. *Plus:* Timor-

[190]GEF, http://www.thegef.org/gef/sites/thegef.org/files/documents/document/09-16-08-SCCF.pdf
[191] ADB, http://pid.adb.org/pid/TaView.htm?projNo=43071&seqNo=01&typeCd=2#timetable

Name		Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
		process; and • Adaptation preparation–up to five countries will be supported in preparing the implementation of climate change adaptation plans, including further capacity building						Leste
			In Samoa: Additional information required.					
12.	Community-based Adaptation (CBA) Programme[192]	The objective of the program is to enhance the capacity of communities in the pilot countries to adapt to climate change including variability. Planned outcomes are: • Enhanced adaptive capacity allows communities to reduce their vulnerability to adverse impacts of future climate hazards; • National policies and programs include community-based adaptation priorities to promote replication, up-scaling and integration of best practices derived from community-based adaptation projects; and • Cooperation among member countries promotes global innovation in adaptation to climate change including variability.	GEF (Strategic Priority on Adaptation), co-financing *Budget:* US$4.5 million	UNDP	Knowledge communication; Capacity Building; Community-based adaptation	2009–2011	Multi-sectoral	*Global:* Bangladesh, Bolivia, Guatemala, Jamaica, Kazakhstan, Morocco, Namibia, Niger, Samoa, Viet Nam
			In Samoa: The projects completed in Samoa as part of the CBA program focus on coastal ecosystems and the maintenance of their goods and services. Projects underway in Samoa as part of this initiative are: • Satoalepai Coastal Resources Adaptation Project (co-funded by AusAID); • Reducing impacts of climate change-driven erosion through protection and conservation of mangroves, eco-systems, and coral reefs; • Community-Based Adaptation against flooding and sea level rise in the communities of Fagamolo, Avao, Vaipouli, Salei'a and Safai; and • Community-Based Adaptation for Lelepa Village.[193]					
13.	Pacific Mangroves Initiative[194]	In this project data will be collected and analyzed to identify climate risks and assist participating countries to create policies for	German Federal Environment	IUCN, University of the South	Research; Capacity building	2009–2013	Coastal zone management; Government	*Regional:* Fiji, Samoa, Solomon

[192] UNDP, http://www.undp-adaptation.org/projects/websites/index.php?option=com_content&task=view&id=203
[193] CBA, http://www.undp-adaptation.org/projects/websites/index.php?option=com_content&task=view&id=252&sub=1
[194] BMU, http://www.bmu-klimaschutzinitiative.de/en/projects?p=1&d=525

Name		Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
		management and restorations of mangroves and associated ecosystems. Public awareness will also be part of the project.	Ministry *Budget:* €2,297,249	Pacific, SPREP				Islands, Tonga, Vanuatu
			In Samoa: Additional information required.					
14.	Coping with Climate Change in the Pacific Island Region[195]	Enhance the competence and capabilities of the local population, the national governmental authorities and regional organizations—SPC and SPREP—in order to cope with the effects of climate change and combat its causes. It includes reviewing policies and integrating adaptation considerations into them, and focuses on the management of land and coastal natural resources, as well as tourism. At the regional level, the program aligns with the Pacific Island Framework for Action on Climate Change 2006–2015. Originally only involving Fiji, Tonga, Vanuatu, the project has been expanded and extended.	German Federal Ministry for Economic Cooperation and Development *Budget:* €17.2 million	GIZ, SPC	Capacity building; Policy formation and integration; Field implementation	2009–2015	Agriculture; Forestry; Tourism	*Regional:* FSM, Fiji, Kiribati, Marshall Islands, Nauru, Palau, PNG, Samoa, Solomon Islands, Tonga, Tuvalu, Vanuatu
			In Samoa: Additional information required.					
15.	Cities and Climate Change Initiative Asia Pacific[196]	This initiative aims to strengthen the climate change response of cities and local governments. The main objectives are to: promote active climate change collaboration between local governments and associations; to enhance policy dialogue on climate change; to support local governments in preparing climate action plans; and to foster awareness, education	UN-Habitat *Budget:* US$10 million	Local governments, universities	Capacity building; Knowledge communication; Policy formation and integration	2010–?	Urban areas	*Asia Pacific:* China, Fiji, Indonesia, Mongolia, Nepal, Papua New Guinea, Samoa, Sri Lanka, Vanuatu and

[195] GIZ, http://www.gtz.de/en/weltweit/asien-pazifik/27718.htm and SPC, http://www.spc.int/lrd/index.php?option=com_content&view=article&id=478&Itemid=44

[196] CCCI, http://www.fukuoka.unhabitat.org/programmes/ccci/index_en.html

Name		Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
		and capacity building.						Viet Nam
			In Samoa: Capacity building on climate risk management, policy planning, and knowledge sharing.					

D. Proposed Adaptation Action

Samoa identified a number of projects in its NAPA to address many of its capacity building needs. All of the adaptation projects suggested have a strong community component. Support for implementation of these priority actions has been received from the LCDF through the projects "Integrated Climate Change Adaptation in Samoa" and "Integration of Climate Change Risk and Resilience into Forestry Management."

Table 3: Proposed Adaptation Projects and Programs from the National Adaptation Programme of Action for Samoa

Name		Objectives	Type of project	Priority Sector(s)	Geographic focus (if any)
1.	Securing Community Water Resources Project	To improve water quality, accessibility and availability (quantity) of communities.	Capacity building	Agriculture; Human health; Freshwater supply	
			Notes: *Implementing Agency:* Samoa Water Authority (SWA) *Coordinating Agency:* Ministry of Natural Resources, Environment & Meteorology		
2.	Reforestation, Rehabilitation and Community Forestry Fire Prevention Project	To protect, rehabilitate, and increase resilience of coastal lowland and inland forest resources.	Capacity building	Forestry	
			Notes: *Implementing Agency:* Ministry of Agriculture, Fire Services, SWA *Coordinating Agency:* Ministry of Natural Resources, Environment and Meteorology in close collaboration with identified vulnerable communities.		
3.	Climate Health Cooperation Program Project	To institute coordination of climate-health partnership programs and emergency measures to respond to climate change and extreme events.	Capacity building	Human health	
			Notes: *Implementing Agencies:* Ministry of Health, Ministry of Natural Resources, Environment and Meteorology *Coordinating Agency:* Ministry of Natural Resources, Environment and Meteorology		
4.	Climate Early Warning System Project	To implement effective early warning systems and emergency response measures to climate and extreme events.	Capacity building	Climate information services	
			Notes: *Implementing Agency:* Ministry of Natural Resources, Environment and		

Name		Objectives	Type of project	Priority Sector(s)	Geographic focus (if any)
			Meteorology *Coordinating Agencies:* Ministry of Natural Resources, Environment and Meteorology		
5.	Agriculture and Food Security Sustainability Project	To maintain economically subsistent agriculture and sustain food security in communities.	Capacity building	Agriculture	
			Notes: *Institutional Arrangements:* Ministry of Agriculture with close collaboration with communities *Coordinating Agencies:* Ministry of Natural Resources, Environment and Meteorology		
6.	Zoning and Strategic Management Planning	Implement zoning and strategic management planning.	Capacity building	Multi-sectoral	
			Notes: *Implementing Agencies:* Ministry of Natural Resources, Environment and Meteorology *Coordinating Agencies:* Ministry of Natural Resources, Environment and Meteorology, Project Steering Committee (Advisory Committee)		
7.	Implement Coastal Infrastructure Management Plans for Highly Vulnerable Districts Project	To implement plans for Highly Vulnerable Districts Project.	Capacity building	Coastal zone management	
			Notes: *Implementing Agencies:* Ministry of Natural Resources, Environment and Meteorology Ministry of Water, Transportation and Infrastructure		
8.	Establishing Conservation Programs in Highly Vulnerable Marine and Terrestrial Areas of Communities Project	To establish and or strengthen community-based conservation programs for the protection of highly vulnerable terrestrial and marine biodiversity.	Capacity building	Marine management; Ecosystem conservation	
			Notes: *Implementing Agencies:* Ministry of Natural Resources, Environment and Meteorology, Ministry of Agriculture *Coordinating Agency:* Project Steering Committee		
9.	Sustainable Tourism Adaptation Project	Implement sustainable tourism adaptation project.	Capacity building	Tourism	
			Notes: *Implementing Agencies:* Samoa Tourism, Ministry of Natural Resources, Environment and Meteorology *Coordinating Agency:* Ministry of Agriculture, NGOs, Communities, Resorts, Hotels		

E. Assessment

Samoa has a very high number of projects underway focused on reducing vulnerability to the impacts of climate change, particularly in the areas of forestry and agriculture. Action is also taking place in a breadth of other areas, including water, health, infrastructure and

climate forecasting/meteorology. However, greater attention may need to be given to addressing coastal resource management, fisheries (a key economic sector), and disaster risk reduction concerns. As well, gender considerations are not a prominent component of any current adaptation project or proposed strategy. Clarification regarding the extent to which adaptation is being integrated into national policy and planning processes also is required.

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11.0 Solomon Islands

ADB	Asian Development Bank
AusAID	Australia Agency for International Development
CIA	Central Intelligence Agency
DCCEE	Department of Climate Change and Energy Efficiency (Australia)
DRR	Disaster Risk Reduction
EU	European Union
GEF	Global Environment Facility
IUCN	International Union for the Conservation of Nature
LDC	Least Developed Country
NAPA	National Adaptation Programmes of Action
NOAA	National Oceanic and Atmospheric Administration (United States)
PACC	Pacific Islands Adaptation to Climate Change Project
PNG	Papua New Guinea
SCCF	Special Climate Change Fund
SIMCTA	Solomon Islands Ministry of Culture, Tourism and Aviation
SIMECM	Solomon Islands Ministry of Environment, Conservation and Metorology
SPA	Strategic Priority for Adaptation (Global Environment Facility)
SPREP	Secretariat to Pacific Regional Environmental Program
UNDP	United Nations Development Programme

The Solomon Islands are a group of nearly 1,000 islands approximately 1,100 kilometers east of Papua New Guinea. Covering a land area of approximately 28,400 square kilometers, the Solomon Islands are home to approximately 571,000 people. Ranked among the least developed countries in the world, most Solomon Islanders are engaged in subsistence agriculture and fishing activities. Timber was once a major export from the islands, but recently this resource has become dangerously depleted. The islands are rich in many undeveloped mineral resources like lead, zinc, nickel and gold (CIA, 2011).

A. Adaptation Needs and Priorities

The most significant impacts of climate change for the Solomon Islands are expected to be due to the effect of rising temperatures on flora and fauna and sea level rise (SIMCTA, 2004). Anticipated impacts of climate changes for different sectors within the Solomon Islands, as well as some potential adaptation strategies, are presented in Table 1.

Table 1: Climate change impacts and possible adaptation strategies for key sectors in the Solomon Islands (SIMCTA, 2004; SIMECM, 2009)

Sector	Vulnerability	Potential Adaptation Action
Subsistence and Commercial Agriculture	An increase in the duration, frequency and intensity of cyclones, along with salt water intrusions, would decrease crop yields	• National Food Security Program and provincial food banks • Crop diversification • Research into and breeding of salt-tolerant root crops and drought resistant crops • Improved water and soil conservation programs • Intercropping and hydroponics • National urban fruit tree planting
Coastal Environments and Systems	Coastal areas may experience flooding and erosion, and coral bleaching may occur due to an increase in sea temperature. Mangrove forests are also at risk because the effects of sea level rise on their habitats	• Protection of mangrove areas • Re-vegetation of shore areas • Resettlement of urban areas
Human Health	Some strains of malaria are endemic to the Solomon Islands, and eradication programs have thus far been inefficient. Extreme weather events, especially flooding, will create ideal conditions for mosquitos to breed and may increase the prevalence of malaria	• Malaria awareness program • Use of bed nets and mosquito eradication • Improvement of medical services • Capacity building for understanding the relationship between climate change and variability
Freshwater Resources	Climate change is expected to decrease the availability and quality of water resources	• Increase in water storage capacity • Conservation of water • Centralized water treatment • Identification of alternative surface and groundwater sources
Marine Resources	Increases in sea temperature are associated with smaller tuna catches, but there is little information about how these fish stocks will be affected in the future due to climate change	• Marine breeding and restocking programs • Quota system for tuna and subsistence fishing • Comprehensive inventory of marine resources
Climate Forecasting and Response		• Rapid response to disasters • Strengthening capacity in hydrological services • Weather forecasting and weather stations establishment

Sector	Vulnerability	Potential Adaptation Action
Human Settlements		• Enhancement for communities to be able to plan for relocation
Education and Awareness		• Incorporation of information in school curriculum

B. National Level Policies and Strategic Documents

The Solomon Islands released its Initial National Communication to the United Nations Framework Convention on Climate Change in 2004, and its National Adaptation Programme of Action (NAPA) in 2009. Progress towards integration of adaptation into national policies and planning processes is unclear.

Table 2: Key Government Policies and Reports reflecting Adaptation Needs, Priorities and Planned Actions

Name of Policy Action		Government Division Responsible	Status	Sector(s) of Focus	Summary description
1.	Solomon Islands. Initial National Communications under the United Nations Framework Convention on Climate Change[197]	Ministry of Culture, Tourism and Aviation	Released in 2004	Agriculture; Human health; Coastal zone management; Freshwater supply; Marine management	The document outlines the baseline information for the country in terms of greenhouse gas emissions and socioeconomic status. It also covers the country's key adaptation priorities and needs, and provides a list of possible adaptation strategies. Several areas are identified as being vulnerable, like coral reefs, mangroves, coastal areas, degraded soil areas and degraded forest areas.
2.	Solomon Islands National Adaptation Programme of Action[198]	Ministry of Environment, Conservation and Meteorology	Released in December 2009	Multi-sectoral	This document outlines the urgent and immediate adaptation needs of the country, specifically those related to sea level rise and impacts on human health, water quality and environmental quality. The priority sectors are discussed and ranked in priority order and several adaptation projects are identified and outlined.

C. Current Adaptation Action

There exists a high level of adaptation focused projects and programs in the Solomon Islands relative to other Pacific Island countries. All of these projects are also being undertaken in other developing countries; no projects tailored only to the needs of the Solomon Islands were identified. These projects are addressing concerns related predominately to coastal zone management, agriculture, disaster

[197] UNFCCC, http://unfccc.int/resource/docs/natc/slbnc1.pdf
[198] UNFCCC, http://unfccc.int/resource/docs/napa/slb01.pdf

risk reduction and policy and planning. Most projects support capacity building and research; a smaller number have a pilot implementation component. The main funders in the country are the Asian Development Bank (ADB) and the governments of Australia, Germany and the United States.

Table 3: Current Adaptation Projects and Programs active in Solomon Islands

Name		Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
Participation in Regional and Global Actions								
1.	Pacific Islands Climate Prediction Project[199]	The project aimed to expand understanding of how seasonal climate prediction services can be applied to support climate-sensitive decision making and the use of climate predictions by National Meteorological Services and industries/agencies which use climate information (e.g. farmers, tourism, water resource managers and health authorities). Along with the provision of software tailored to local circumstances and training in the effective use of climate predictions in a risk management context, the project undertook specific pilot activities.	AusAID *Budget:* AU$3.0 million	Australia Bureau of Meteorology	Research; Capacity building	Phase I: 2004–2006 Phase II: 2007–2009 (*completed*)	Climate information services	*Regional:* Cook Islands, Fiji, Kiribati, Niue, PNG, Samoa, Solomon Islands, Tonga, Tuvalu, Vanuatu
			In Solomon Islands: Participated in the pilot projects "Climate and Oceanographic Variability and their Impacts on Fisheries"[200] completed in 2005 and "Application of Climate Forecasting in Water Management"[201] completed in 2008.					
2.	Preparedness for Climate Change[202]	The aim of this program was for the Red Cross and Red Crescent National Societies in countries particularly vulnerable to climate change to gain a better understanding of climate change and its impacts to identify country-specific adaptation measures in line with risks. Activities could include organizing a workshop on risks, assessment of risks through preparation of a background	Red Cross/Red Crescent Climate Centre	National Red Cross/Red Crescent Societies	Capacity building; Policy formation and integration	Phase 1: 2006–2009 Phase 2: ongoing	Disaster risk management;	*Global:* 39 countries *Pacific participants in Phase 1:* Cook Islands, Kiribati, Solomon

[199] BOM, http://www.bom.gov.au/climate/pi-cpp/ and ALM, http://www.adaptationlearning.net/project/pacific-islands-climate-predictions-project-pi-cpp
[200] BOM. http://www.bom.gov.au/climate/pi-cpp/pilot_projects/fisheries_guide.shtml
[201] BOM, http://www.bom.gov.au/climate/pi-cpp/pilot_projects/water_mgt.shtml
[202] IFRC, http://www.climatecentre.org/site/preparedness-for-climate-change-programme

Name		Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
		document, capacity building programs, and developing climate change resilient plans.						Islands, Tonga
			In Solomon Islands: By the conclusion of the first phase of the project, the Red Cross was developing climate change resilient plans and programs.[203]					
3.	Regional Partnerships for Climate Change Adaptation and Disaster Preparedness[204]	The outcome is expected to be a strengthened information system that will support informed decision-making aimed at minimizing the negative social and environmental impacts of catastrophic events. It will also mitigate the financial risk of participating Pacific developing member countries to the effects of natural disasters, including those exacerbated by human-induced climate change. This work is linked to the World Bank's work on the development of a Caribbean Catastrophe Insurance Facility for the Pacific.	ADB *Budget:* US$1.0 million	World Bank	Capacity building	Phase 1: 2007–2011	Disaster risk management	*Regional:* Cook Islands, Fiji, PNG, Samoa, Solomon Islands, Tonga, Tuvalu, and Vanuatu
			In Solomon Islands: Data gathering for country-specific risk models to be developed. These models will be used to assess the feasibility of catastrophe risk financing and insurance options.[205]					
4.	Global Climate Change Alliance[206]	The Global Climate Change Alliance seeks to deepen the policy dialogue between the European Union and developing countries on climate change; and to increase support to target countries to implement priority adaptation and mitigation measures, and integration climate change into their development strategies. The program's five priority areas for funding are: improving the knowledge base of developing countries to	European Commission, Czech Republic, Sweden, 10th European Development Fund *Budget:*	National Governments	Policy formation and implementation; Knowledge communication	2008–ongoing	Disaster risk management; Government	*Global: 18 countries*[207] *including:* Solomon Islands, Vanuatu and the Pacific Region as a whole

[203] IFRC, http://www.climatecentre.org/downloads/File/programs/Final%20PFCC%20General%20Assembly%20Document%20with%20renewed%20table.pdf
[204] ADB, http://www.adb.org/Projects/project.asp?id=41187
[205] ADB, http://www.adb.org/Documents/TARs/REG/41187-REG-TAR.pdf
[206] GCCA, http://www.gcca.eu/pages/1_2-Home.html
[207] These countries are: Bangladesh, Belize, Cambodia, Ethiopia, Guyana, Jamaica, Maldives, Mali, Mozambique, Mauritius, Nepal, the Pacific Region, Rwanda, Senegal, Seychelles, Solomon Islands, Tanzania and Vanuatu

Name		Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
		the effects of climate change; promoting disaster risk reduction; mainstreaming climate change into poverty reduction development strategies; reducing emissions from deforestation and degradation; and enhancing participation in the Clean Development Mechanism.	€140 million					
			In Solomon Islands: "Solomon Islands Climate Change Assistance Programme" The program's objective is to support the Government of the Solomon Islands by increasing its capacity for "policy enhancement, coordination and implementation of its national Climate Change strategy in line with its NAPA and National Disaster Risk Management Plan."[208] *Budget:* €2.8 million *Timeline:* 2011–2013					
5.	Pacific Islands Adaptation to Climate Change Project (PACC)[209]	PACC will implement long-term adaptation measures to increase the resilience of a number of key development sectors in the Pacific Islands to the impacts of climate change. This objective will be achieved by focusing on adaptation response strategies, policies and measures to bring about this result. The key development sectors this project will focus on are: 1. water resources management; 2. food production and food security; and 3. coastal zone and associated infrastructure (roads and breakwater). To ensure sustainability of the project, regional and national adaptation financing instruments will constitute a fourth component of the project.	SCCF, co-financing *Budget:* US$59,526,299	UNDP, ADB, SPREP	Capacity building; Policy formation and integration	2008–2012	Agriculture; Coastal zone management; Freshwater supply	*Regional:* Cook Islands, FSM, Fiji, Nauru, Palau, PNG, Solomon Islands, Tonga, Tuvalu, Vanuatu
			In Solomon Islands: Demonstration measures to reduce vulnerability in coastal areas and crop production.					
6.	Vulnerability and Adaptation Initiative[210]	Through this initiative, six Pacific countries have implemented activities to reduce their vulnerability to climate change and achieve good environmental outcomes. The Initiative has funded activities such as the replanting	AusAID;		Field implementation; Capacity building	2008–2012	Multi-sectoral	*Regional:* Fiji, Samoa, Solomon Islands, Tonga, Tuvalu

[208] GCCA, http://www.gcca.eu/cgi-bin/datadirs.pl?&lg=2&id_datadir_family=1&extlink=8&sw=detail&id_datadir_sheet=20
[209] GEF, http://www.thegef.org/gef/sites/thegef.org/files/documents/document/09-16-08-SCCF.pdf
[210] AusAID, http://www.ausaid.gov.au/country/pacific/climate_change.cfm

Name		Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
		of coastal mangroves to protect shorelines, the construction of rain water tanks in islands affected by seasonal drought, the trialing of versatile crop varieties and the recording of traditional knowledge about disaster preparation.						and Vanuatu
			In Solomon Islands: Additional information required.					
7.	U.S. Support Program to the Coral Triangle Initiative (CTI)[211]	To improve the management of biologically and economically important coastal and marine resources and associated ecosystems that support livlihoods and economies in the Coral Triangle and assist the six CTI countries in implementing the CTI Regional and National Plans of Action with activities that focus on instituting an ecosystem approach to fisheries management, creating marine protected areas, building climate change adaptive capacity and establishing regional platforms to promote cross-country learning and enhance sustainability.	USAID *Budget:* US$41 million	WWF, Conservation International, the Nature Conservancy, ARD Inc., NOAA	Capacity building; Assessment; Field implementation	2008–2013	Marine management	*Asia-Pacific:* Indonesia, Malaysia, Philippines, Papua New Guinea, Solomon Islands, Timor-Leste
			In Solomon Islands: additional information required.					
8.	Coastal and Marine Resources Management in the Coral Triangle of the Pacific (under the Pacific Alliance for Sustainability Program and the Coral Triangle Initiative)[212]	To promote the conservation and sustainable use of globally significant coastal and marine resources in the Coral Triangle region through the introduction of integrated and ecosystem-based coastal and marine resources management in five Pacific countries. Includes the implementation of pilot adaptation measures to enhance resilience and increase capacity to respond to the adverse impacts of climate change on coastal and marine ecosystems.	GEF-SPA; Japan; Australia; United States *Budget:* US$27,568,183	ADB	Capacity building, Research; Field implementation	2008–2013	Coastal zone management; Marine management	*Regional:* FSM, Fiji, Palau, PNG, Solomon Islands and Vanuatu *Plus:* Timor-Leste
			In Solomon Islands: Support to meet emerging commitments under the CTI. Management of shared mining resources. Achieving commitments in migratory turtle protection.					

[211] CTI, http://www.uscti.org/uscti/default.aspx
[212] GEF, http://www.gefonline.org/projectDetailsSQL.cfm?projID=3591

Name		Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
9.	Strengthening the Capacity of Pacific Developing Member Countries to Respond to Climate Change (Phase 1)[213]	Incorporation of climate risk management, adaptation practices, and greenhouse gas mitigation measures into infrastructure and key sector investment plans and project designs. Adaptation related actions include: • Pacific Climate Change Program–will assist participating countries to improve their resilience to climate change impacts through (i) mainstreaming of the adaptation in their policies, plans, programs, and projects; and (ii) strengthening their systems and capabilities to foster the adaptation process; and • Adaptation preparation–up to five countries will be supported in preparing the implementation of climate change adaptation plans, including further capacity building	ADB, Canada *Budget:* US$4.965 million	ADB	Capacity building; Policy formation and integration	2009–?	Government	*Regional:* Cook Islands, Fiji, FSM, Kiribati, Marshall Islands, Nauru, Palau, PNG, Samoa, Solomon Islands, Tonga, Tuvalu, Vanuatu. *Plus:* Timor-Leste
			In Solomon Islands: To be determined					
10.	Pacific Mangroves Initiative[214]	In this project data will be collected and analyzed to identify climate risks and assist participating countries to create policies for management and restorations of mangroves and associated ecosystems. Public awareness will also be part of the project.	German Federal Environment Ministry *Budget:* €2,297,249	IUCN, University of the South Pacific, SPREP	Research; Capacity building	2009–2013	Coastal zone management; Government	*Regional:* Fiji, Samoa, Solomon Islands, Tonga, Vanuatu
			In Solomon Islands: Additional information required.					
11.	Coping with Climate Change in the Pacific Island Region[215]	Enhance the competence and capabilities of the local population, the national governmental authorities and regional	German Federal Ministry for	GIZ, SPC	Capacity building; Policy	2009–2015	Agriculture; Forestry; Tourism	*Regional:* FSM, Fiji, Kiribati,

[213] ADB, http://pid.adb.org/pid/TaView.htm?projNo=43071&seqNo=01&typeCd=2#timetable
[214] BMU, http://www.bmu-klimaschutzinitiative.de/en/projects?p=1&d=525

Name		Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
		organizations—SPC and SPREP—in order to cope with the effects of climate change and combat its causes. It includes reviewing policies and integrating adaptation considerations into them, and focuses on the management of land and coastal natural resources, as well as tourism. At the regional level, the program aligns with the Pacific Island Framework for Action on Climate Change 2006–2015. Originally only involving Fiji, Tonga, Vanuatu, the project has been expanded and extended.	Economic Cooperation and Development *Budget:* Euros 17.2 million		formation and integration; Field implementation			Marshall Islands, Nauru, Palau, PNG, Samoa, Solomon Islands, Tonga, Tuvalu, Vanuatu
			In Solomon Islands: Additional information required.					
12.	Asia Pacific Climate Change Adaptation Project Preparation Facility (ADAPT)[216]	Increase access to financial resources for climate change adaptation investment projects; strengthen national human and institutional capacity in preparation of financing proposals; and strengthen regional knowledge platform to share information and processes on climate change projects, funds and best practices to promote replication and scaling up.	USAID *Budget:* US$18.0 million	WWF, Conservation International, the Nature Conservancy, ARD Inc., NOAA	Capacity building; Knowledge communication	2011–2016	Government	*Asia Region:* Bangladesh Cambodia FSM, Fiji, Indonesia, Lao PDR, Malaysia, Nepal, Palau, Philippines, Solomon Islands, Sri Lanka, Thailand, Viet Nam
			In Solomon Islands: Additional information required.					

[215] GIZ, http://www.gtz.de/en/weltweit/asien-pazifik/27718.htm and SPC, http://www.spc.int/lrd/index.php?option=com_content&view=article&id=478&Itemid=44

[216] USDS, http://www.state.gov/documents/organization/151686.pdf

D. Proposed Adaptation Action

Through its NAPA, the Solomon Islands has identified a number of nationally targeted adaptation actions, as noted in Table 4. The country is also proposed to be involved in several projects developed and submitted for funding to the Special Climate Change Fund (SCCF) and the Adaptation Fund. There is potential that the combination of the current and proposed programs could fulfill the capacity building needs of the Solomon Islands and better enable it to implement standalone adaptation actions.

Table 4: Proposed Adaptation Projects and Programs in Solomon Islands

Name		Objectives	Type of project	Priority Sector(s)	Geographic focus (if any)
1.	Improving the Adaptive Capacity of Communities in Solomon Islands to the Impacts of Climate Change and Climate Variability in the Health Sector			Human health	Malaysia, Papua New Guinea, Philippines, Solomon Islands, Timor-Leste
			Notes: Proposed to the SCCF = US$25,000; Proposed co-financing = TBC		
2.	Adaptation in the Coral Triangle (ACT)			Biodiversity	
			Notes: Proposed to the SCCF = US$20 million; Proposed co-financing = US$290 million		
3.	Increasing Climate Resiliency of the Transport Sector in the Asia-Pacific			Transportation	China, Timor-Leste, Solomon Islands, Viet Nam
			Notes: Proposed to the SCCF = US$30 million; Proposed co-financing = US$1,089,500,000		
4.	Enhancing Resilience of Communities in Solomon Islands to the adverse effects of climate change in Agriculture and Food Security[217]			Agriculture	
			Notes: Submitted to the Adaptation Fund Board. *Planned Implementing Agency:* UNDP		
Projects Proposed in the Solomon Island's NAPA					
5.	Managing the Impact of and Enhancing Resilience to Climate Change and Sea-Level Rise on Agriculture, Food Security, Water Supply and Sanitation, Human Settlements, Human Health and Education, Awareness and Information	To increase adaptive capacity and resilience of key vulnerable sectors	Capacity building	Multi-sectoral	
			Notes:		

[217] AF, http://www.adaptation-fund.org/node/996

Name		Objectives	Type of project	Priority Sector(s)	Geographic focus (if any)
6.	Climate Change Adaptation on Low-lying and Artificially Built Up Islands in Malaita and Temotu Provinces	The main goal is to facilitate adequate adaptation to climate change and sea-level rise	Capacity building	Coastal zone management	
			Notes:		
7.	Waste Management	Main goal of this project is to better manage impacts of climate change on waste management.	Capacity building	Waste management	
			Notes:		
8.	Coastal Protection	The main goal of this project is to increase the resilience and enhance adaptive capacity of coastal communities, socioeconomic activities and infrastructure	Capacity building	Coastal zone management	
			Notes:		
9.	Fisheries and Marine Resources	To improve the understanding of the effects of climate change and climate variability including El Nino-Southern Oscillation on the inshore and tuna fishery resources.	Capacity building	Marine management; Marine fisheries	
			Notes:		
10.	Infrastructure Development	To improve the resilience of key infrastructure to climate change and sea-level rise.	Capacity building	Coastal zone management	
			Notes: NAPA		
11.	Tourism	To integrate climate change adaptation strategies and measures into tourism planning and development.	Policy formation and integration	Tourism	
			Notes: NAPA		

E. Assessment

Ongoing adaptation in the Solomon Islands is addressing some of the key priority areas identified by the Solomon Islands through their NAPA and National Communication. These include increasing resilience in the management of coastal resources and agriculture. However, although high amount of sectors are being targeted through current actions, concerns related to gender, health, water, and human settlements appear to be either unrepresented or overlooked; these could be integrated into current and future proposals as appropriate. Greater attention to marine resources, particularly with respect to its inter-linkages with fisheries and tourism might also be addressed in the future. At the policy level, the degree to which adaptation considerations are being integrated into policy and planning processes is presently unclear, but may be an area for additional attention (building on existing initiatives such as "Strengthening the Capacity of Pacific Developing Member Countries to Respond to Climate Change").

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Central Intelligence Agency [CIA] (2011). The Solomon Islands. *The World Factbook*. Retrieved from https://www.cia.gov/library/publications/the-world-factbook/geos/bp.html

Solomon Islands Ministry of Environment, Conservation and Metorology [SIMECM] (2009). *Solomon Islands National Adaptation Programmes of Action*. Retrieved from http://unfccc.int/resource/docs/napa/slb01.pdf

Solomon Islands Ministry of Culture, Tourism and Aviation [SIMCTA] (2004). *Solomon Islands. Initial National Communications under the United Nations Framework Convention on Climate Change*. Retrieved from http://unfccc.int/resource/docs/natc/slbnc1.pdf

12.0 Tonga

ADB	Asian Development Bank
AusAID	Australian Agency of International Development
CIA	Central Intelligence Agency
FSM	Federated States of Micronesia
GEF	Global Environment Facility
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit (Germany)
IUCN	International Union for the Conservation of Nature
PACC	Pacific Islands Adaptation to Climate Change Project
PNG	Papua New Guinea
SCCF	Special Climate Change Fund
SPREP	Secretariat to Pacific Regional Environmental Program
TDE	Tonga Department of Environment
UNDP	United Nations Development Programme

The Kingdom of Tonga is an archipelago northeast of Australia comprised of 176 islands scattered over 700,000 square kilometers of ocean in the South Pacific. It is the only island nation in the Pacific region that has not been formal colonization. Its economic base is small and mainly comprised of agricultural exports and tourism; the country remains dependent on foreign aid (CIA, 2011).

A. Adaptation Needs and Priorities

The main vulnerabilities Tonga has identified relative to climate change are a potential increase in the frequency, duration and/or intensity of tropical cyclones, and sea level rise. Several strategies have been suggested to aid in adapting to potential changes within different sectors (TDE, 2005):

- *Coastal Areas:* building up coastal areas with crushed limestone; relocation; protection of infrastructure against storm events; re-vegetation of coastal areas; elimination of onshore sand mining; fencing domestic animals (hard hooves and foraging for food damage sensitive soils); and coral management plan.
- *Fisheries:* monitoring changes; and legislation and regulation.

- *Agriculture:* introduction of salt tolerant species; introduction of heat tolerant crops; improved pest and disease management; crop research; restoration of degraded lands; species diversification; and farm relocation.
- *Forestry:* land use policy; legislation and regulation; reforestation; promotion for agroforestry.
- *Human Health:* research to understand relationship between climate and human health; and standardize health impact assessment procedures.
- *Water Resources:* demand management; leakage control; consumer education and awareness; pricing policy; water conservation plumbing measures; alternative water supply; expansion of rainwater collection; groundwater protection; importing water; and desalination of water.

At a more macro level, the main responses to climate change recommended by and for Tonga are (TDE, 2005):

- Institutionalize and mainstream climate change preparedness;
- Increase national capacity to prepare and adapt to climate change;
- Increase public awareness and improve understanding of climate change, variability, sea level rise, extreme events and their preparedness;
- Facilitate and mainstream adaptation options into all sectoral planning; and
- Develop a national climate change framework and policy.

B. National Level Policies and Strategic Documents

The Kingdom of Tonga's Initial National Communication to the United Nations Framework Convention on Climate Change was released in 2005. It notes that Tonga has a limited capability to address the myriad issues anticipated to result from climate change, and calls for the development of a policy framework for adaptation, public awareness, systematic observation, research and capacity building (TDE, 2005). The country has subsequently undertaken efforts to integrate climate change adaptation into national policies. Notably, in 2009, the Tongan cabinet adopted a new Forest Policy into which reference to climate change has been integrated.

Table 1: Key Government Policies and Reports reflecting Adaptation Needs, Priorities and Planned Actions

Name of Policy Action		Government Division Responsible	Status	Sector(s) of Focus	Summary description
1.	The Kingdom of Tonga's Initial National Communication[218]	Tonga Department of Environment	Released May 2005	Multi-sectoral	This document provides the environmental and socioeconomic background of Tonga, as well as a greenhouse gas emissions inventory. The main vulnerabilities and adaptation strategies are also outlined.
2.	Tonga Forest Policy[219]	Government of Tonga	Approved by Cabinet in 2009	Forestry	The revised Tonga Forest Policy incorporates climate change elements related to mitigation, adaptation, awareness raising and international assistance. Its adaptation components specifically highlight the need to reforest vulnerable coastlines, protect mangrove forests, complete research on resilient tree species, and capacity building.

C. Current Adaptation Action

Adaptive action in Tonga is focused in the areas of agriculture, water resources, coastal zone management and policy and planning. Most of these projects have a capacity building component; about a quarter of the projects involve pilot implementation of adaptation actions. All identified projects underway are those in which Tonga is one of several participating countries. The majority of the funding for Tonga's adaptation actions is provided by the Asian Development Bank (ADB) and the governments of Australia and Germany.

Table 2: Current Adaptation Projects and Programs active in Tonga

Name		Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
Participation in Regional and Global Actions								
1.	Pacific Islands Climate Prediction Project[220]	The project aimed to expand understanding of how seasonal climate prediction services can be applied to support climate-sensitive decision making and the use of climate	AusAID *Budget:* US$3.0	Australia Bureau of Meteorology	Research; Capacity building	Phase I: 2004–2006 Phase II: 2007–2009	Climate information services	*Regional:* Cook Islands, Fiji, Kiribati, Niue, PNG,

[218] UNFCCC, http://unfccc.int/resource/docs/natc/tonnc1.pdf
[219] SPC, http://www.spc.int/lrd/index.php?option=com_content&view=article&id=546:climate-change-mainstreamed-into-new-tonga-forest-policy&catid=174:policy&Itemid=19
[220] BOM, http://www.bom.gov.au/climate/pi-cpp/ and ALM, http://www.adaptationlearning.net/project/pacific-islands-climate-predictions-project-pi-cpp

Name		Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
		predictions by National Meteorological Services and industries/agencies which use climate information (e.g. farmers, tourism, water resource managers and health authorities). Along with the provision of software tailored to local circumstances and training in the effective use of climate predictions in a risk management context, the project undertook specific pilot activities.	million			(*completed*)		Samoa, Solomon Islands, Tonga, Tuvalu, Vanuatu
			In Tonga: Climate forecasting focusing on rainfall and tropical cyclones.[221] Participated in the pilot projects "Climate and Oceanographic Variability and their Impacts on Fisheries"[222] completed in 2005 and "Application of Climate Forecasting in Water Management"[223] completed in 2008.					
2.	Preparedness for Climate Change[224]	The aim of this program was for the Red Cross and Red Crescent National Societies in countries particularly vulnerable to climate change to gain a better understanding of climate change and its impacts to identify country-specific adaptation measures in line with risks. Activities could include organizing a workshop on risks, assessment of risks through preparation of a background document, capacity building programs, and developing climate change resilient plans.	Red Cross/Red Crescent Climate Centre	National Red Cross/Red Crescent Societies	Capacity building; Policy formation and integration	Phase 1: 2006–2009 Phase 2: ongoing	Disaster risk management;	*Global:* 39 countries *Pacific participants in Phase 1:* Cook Islands, Kiribati, Solomon Islands, Tonga
			In Tonga: By the conclusion of the first phase of the project, the Red Cross was developing climate change resilient plans and programs.[225]					

[221] BOM, http://www.bom.gov.au/climate/pi-cpp/ton.shtml
[222] BOM, http://www.bom.gov.au/climate/pi-cpp/pilot_projects/fisheries_guide.shtml
[223] BOM, http://www.bom.gov.au/climate/pi-cpp/pilot_projects/water_mgt.shtml
[224] IFRC, http://www.climatecentre.org/site/preparedness-for-climate-change-programme
[225] IFRC, http://www.climatecentre.org/downloads/File/programs/Final%20PFCC%20General%20Assembly%20Document%20with%20renewed%20table.pdf

Name		Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
3.	Regional Partnerships for Climate Change Adaptation and Disaster Preparedness[226]	The outcome is expected to be a strengthened information system that will support informed decision-making aimed at minimizing the negative social and environmental impacts of catastrophic events. It will also mitigate the financial risk of participating Pacific developing member countries to the effects of natural disasters, including those exacerbated by human-induced climate change. This work is linked to the World Bank's work on the development of a Caribbean Catastrophe Insurance Facility for the Pacific.	ADB *Budget:* US$1.0 million	World Bank	Capacity building	Phase 1: 2007–2011	Disaster risk management	*Regional:* Cook Islands, Fiji, PNG, Samoa, Solomon Islands, Tonga, Tuvalu, and Vanuatu
			In Tonga: Data gathering for country-specific risk models to be developed. These models will be used to assess the feasibility of catastrophe risk financing and insurance options.[227]					
4.	Pilot Program for Climate Resilience (PPCR) [228]	PPCR aims to pilot and demonstrate ways in which climate risk and resilience may be integrated into core development planning and implementation in a way that is consistent with poverty reduction and sustainable development goals. In this way, the PPCR provides incentives for scaled-up action and initiates transformational change. The pilot programs and projects implemented under the PPCR are country-led, build on NAPAs and other relevant country studies and strategies. Pacific participation includes Papua New Guinea, Samoa, Tonga.	World Bank's Strategic Climate Fund *Budget:* US$971.75 million pledged as of February 2011	World Bank	Policy formation and integration	2008–?	Multi-sectoral	*Regional Programs:* Caribbean and Pacific *Country programs:* Bangladesh, Bolivia, Cambodia, Mozambique, Nepal, Niger, Tajikistan, Yemen, Zambia
			In Tonga: Investment plan in development.[229]					

[226] ADB, http://www.adb.org/Projects/project.asp?id=41187
[227] ADB, http://www.adb.org/Documents/TARs/REG/41187-REG-TAR.pdf
[228] PPRC, http://www.climatefundsupdate.org/listing/pilot-program-for-climate-resilience
[229] PPRC, http://www.climateinvestmentfunds.org/cifnet/?q=country-program-info/tongas-ppcr-programming

Name		Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
5.	Pacific Islands Adaptation to Climate Change Project (PACC)[230]	PACC will implement long-term adaptation measures to increase the resilience of a number of key development sectors in the Pacific Islands to the impacts of climate change. This objective will be achieved by focusing on adaptation response strategies, policies and measures to bring about this result. The key development sectors this project will focus on are: 1. water resources management; 2. food production and food security; and 3. coastal zone and associated infrastructure (roads and breakwater). To ensure sustainability of the project, regional and national adaptation financing instruments will constitute a fourth component of the project.	SCCF, co-financing *Budget:* US$59,526,299	UNDP, ADB, SPREP	Capacity building; Policy formation and integration	2008–2012	Agriculture; Coastal zone management; Freshwater supply	*Regional:* Cook Islands, FSM, Fiji, Nauru, Palau, PNG, Solomon Islands, Tonga, Tuvalu, Vanuatu
			In Tonga: Demonstration measures to reduce vulnerably in coastal areas and water management; groundwater monitoring, funded water tanks and rainwater harvesting.					
6.	Vulnerability and Adaptation Initiative[231]	Through this initiative, six Pacific countries have implemented activities to reduce their vulnerability to climate change and achieve good environmental outcomes. The Initiative has funded activities such as the replanting of coastal mangroves to protect shorelines, the construction of rain water tanks in islands affected by seasonal drought, the trialing of versatile crop varieties and the recording of traditional knowledge about disaster preparation.	AusAID		Field implementation; Capacity building	2008–2012	Multi-sectoral	*Regional:* Fiji, Samoa, Solomon Islands, Tonga, Tuvalu and Vanuatu
			In Tonga: Additional information required.					
7.	Strengthening the Capacity of Pacific Developing Member Countries to	Incorporation of climate risk management, adaptation practices, and greenhouse gas mitigation measures into infrastructure and	ADB, Canada *Budget:*	ADB	Capacity building; Policy	2009–?	Government	*Regional:* Cook Islands, Fiji, FSM,

[230] GEF, http://www.thegef.org/gef/sites/thegef.org/files/documents/document/09-16-08-SCCF.pdf
[231] AusAID, http://www.ausaid.gov.au/country/pacific/climate_change.cfm

Name		Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
	Respond to Climate Change (Phase 1)[232]	key sector investment plans and project designs. Adaptation related actions include: • Pacific Climate Change Program–will assist participating countries to improve their resilience to climate change impacts through (i) mainstreaming of the adaptation in their policies, plans, programs, and projects; and (ii) strengthening their systems and capabilities to foster the adaptation process; and • Adaptation preparation–up to five countries will be supported in preparing the implementation of climate change adaptation plans, including further capacity building	US$4.965 million		formation and integration			Kiribati, Marshall Islands, Nauru, Palau, PNG, Samoa, Solomon Islands, Tonga, Tuvalu, Vanuatu. *Plus:* Timor-Leste
			In Tonga: to be determined.					
8.	Pacific Mangroves Initiative[233]	In this project data will be collected and analyzed to identify climate risks and assist participating countries to create policies for management and restorations of mangroves and associated ecosystems. Public awareness will also be part of the project.	German Federal Environment Ministry *Budget:* €2,297,249	IUCN, University of the South Pacific, SPREP	Research; Capacity building	2009–2013	Coastal zone management; Government	*Regional:* Fiji, Samoa, Solomon Islands, Tonga, Vanuatu
			In Tonga: more information needed.					
9.	Coping with Climate Change in the Pacific Island Region[234]	Enhance the competence and capabilities of the local population, the national governmental authorities and regional organizations—SPC and SPREP—in order to	German Federal Ministry for Economic	GIZ, SPC	Capacity building; Policy formation and	2009–2015	Agriculture; Forestry; Tourism	*Regional:* FSM, Fiji, Kiribati, Marshall

[232] ADB, http://pid.adb.org/pid/TaView.htm?projNo=43071&seqNo=01&typeCd=2#timetable
[233] BMU, http://www.bmu-klimaschutzinitiative.de/en/projects?p=1&d=525
[234] GIZ, http://www.gtz.de/en/weltweit/asien-pazifik/27718.htm and SPC, http://www.spc.int/lrd/index.php?option=com_content&view=article&id=478&Itemid=44

Name		Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
		cope with the effects of climate change and combat its causes. It includes reviewing policies and integrating adaptation considerations into them, and focuses on the management of land and coastal natural resources, as well as tourism. At the regional level, the program aligns with the Pacific Island Framework for Action on Climate Change 2006–2015. Originally only involving Fiji, Tonga, Vanuatu, the project has been expanded and extended.	Cooperation and Development *Budget:* €17.2 million		integration; Field implementation			Islands, Nauru, Palau, PNG, Samoa, Solomon Islands, Tonga, Tuvalu, Vanuatu
			In Tonga: As part of this project, the Tongan cabinet adopted the policy framework document on the forestry management of the country in 2009 that integrated references to climate change.[235]					

D. Proposed Adaptation Action

There is no evidence of proposed adaptation action in Tonga at this time.

E. Assessment

Tonga is involved in moderate number of regional projects relative to other Pacific Island countries. These projects address some of the country's priority needs related to coastal zone management, agriculture, water and policy integration. While further support could be given in these areas, there appears to be a gap in efforts with respect to those focused on reducing vulnerability within the health and fisheries sectors—two priority areas of identified by Tonga. Moreover, gender is not a prominent focal area of any current adaptation projects or proposed strategies. Tonga also identified the need to develop a national climate change framework and policy. The extent to which progress has been made towards achievement of this goal remains to be determined; as too is the extent to which adaptation is being mainstreamed into sectoral planning other than forestry.

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Central Intelligence Agency [CIA] (2011). Tonga. *The World Factbook*. Retrieved from https://www.cia.gov/library/publications/the-world-factbook/geos/tn.html

[235] GIZ, http://www.gtz.de/en/weltweit/asien-pazifik/27718.htm

Tonga Department of Environment [TDE] (2005). *The Kingdom of Tonga's Initial National Communication*. Retrieved from http://unfccc.int/resource/docs/natc/tonnc1.pdf

13.0 Tuvalu

ADB	Asian Development Bank
AusAID	Australia Agency of International Development
CBO	Community Based Organization
CIA	Central Intelligence Agency
DCCEE	Department of Climate Change and Energy Efficiency (Australia)
FSM	Federated States of Micronesia
LDCF	Least Developed Countries Fund
NGO	Non-Governmental Organization
PACC	Pacific Adaptation to Climate Change Project
PNG	Papua New Guinea
SCCF	Special Climate Change Fund
SNC	Second National Communication
SPREP	Secretariat of the Pacific Regional Environment Programme
MNRE	Ministry of Natural Resources and Environment
UNDP	United Nations Development Programme

Tuvalu is an island nation with an estimated population of 10,500 people located on nine small islands approximately halfway between Hawaii and Australia. Classified as a least developed country, the islands of Tuvalu contain few natural resources. The primary economic activities of the country are subsistence farming and fishing; income from foreign aid is an important part of the economy Tuvalu also sells some stamps, coins and, in the last 10 years, has sold use of their Internet domain ".tv"—an action that contributes a substantial amount of revenue to their overall Gross Domestic Product (CIA, 2011).

A. Adaptation Needs and Priorities

The main climate change vulnerability of Tuvalu is sea level rise; none of its islands are more three meters above sea level (MNRE, 1999). Other concerns are rising temperatures, a potential increase in the frequency of extreme weather events, increased coastal erosion, and threats to the food supply, freshwater resources and human health. Changes already observed within Tuvalu include saltwater intrusions, collapsed seawalls, enhancement of salt-tolerant trees and less productive land.

Through its Initial National Communication to the United Nations Framework Convention on Climate Change, Tuvalu identified its main areas for adaptation as being human health, agriculture, and water quality. Actions put forward included: completion of environment impact assessments for all new projects; development of a comprehensive set of policies around climate change; incorporation of climate change issues into primary and secondary schools; and radio programs, leaflets, essay competitions, poster competitions, national workshops and visits to outer islands to promote education and awareness on climate change and sea level rise (MNRE, 1999).

More recently, Tuvalu has refined identification of its key priorities for adaptation, which are presented in order of priority as being (MNRE, 2007):

- *Coastal Areas:* Increasing resilience of coastal areas and settlements to climate change.
- *Agricultural:* Increasing subsistence pit grown pulaka productivity through introduction of a salt-tolerant pulaka species.
- *Freshwater:* Adaptation to frequent water shortages through increasing household water capacity, water collection accessories, water conservation techniques, and constuction of seawalls to minimize salt water intrusions
- *Human Health:* Strengthening of community health through control of vector borne/climate sensitive diseases and promoting access to quality potable water.
- *Fisheries:* Strengthening of community based conservation programs focused on highly vulnerable near-shore coastal shellfish fisheries resources and coral reef ecosystem productivity.
- *Marine Ecosystems*: Increase information on the relationship between marine productivity and climate change.
- *Disaster Risk Reduction:* Strengthening community disaster preparedness and response potential.

B. National Level Policies and Strategic Documents

The Tuvalu Initial National Communication, released in 1999, documents some of the early identified needs and vulnerabilities of the country. It set the stage for development of Tuvalu's National Adaptation Programme of Action (NAPA). Released in 2007, the NAPA provides detailed information about the current and possible future impacts of climate change on this island nation.

The need to adapt to the impacts of climate change is also highlighted in Tuvalu's National Strategy for Sustainable Development for the period of 2005 to 2015. Within this document, Tuvalu sets as a goal the establishment of national climate change policy addressing both mitigation and adaptation. To this end, in May 2011, it was announced that the government of Tuvalu will work with the United

Nations Development Programme (UNDP) and the Secretariat of the Pacific Regional Environment Programme (SPREP) through the "Pacific Adaptation to Climate Change" (PACC) project to develop a climate change policy. Funding has been provided by the Global Environment Facility, and a project team comprised of governmental and international experts established. The government envisions that a climate change policy will assist in the coordination and implementation of mitigation and adaptation strategies (SPREP, 2011).

Table 1: Key Government Policies and Reports reflecting Adaptation Needs, Priorities and Planned Actions

Name of Policy Action		Government Division Responsible	Status	Sector(s) of Focus	Summary description
1.	Tuvalu Initial National Communication Under the United Nations Framework Convention on Climate Change[236]	Ministry of Natural Resources and Environment	Released October 1999	Multi-sectoral	This document gives a detailed background of the situation in Tuvalu, and outlines the vulnerabilities of the country in terms of climate change. The islands have already experiences a higher than average amount of sea level rise and have concerns about water supply, human health, infrastructure and coastal erosion.
2.	Te Kakeega II National Strategy for Sustainable Development (2005–2015)[237]	Ministry of Finance, Economic Planning and Industries	Released November 2005	Multi-sectoral	Setting forward Tuvalu's 10 year development objectives, this strategy identifies climate change impacts as one of two key environmental management challenges. Priorities identified include the establishment of national climate change mitigation and adaptation policies.
3.	Tuvalu's National Adaptation Programme of Action[238]	Ministry of Natural Resources and Environment	Released May 2007	Multi-sectoral	This document outlines the impacts, vulnerabilities and adaptation measures taken by Tuvalu government. Several national projects are outlined in this document that focus on the following major sectors: coastal resilience, agricultural adaptation, water resource adaptation, human health, strengthening community-based fisheries and strengthening disaster preparedness and response.

C. Current Adaptation Action

A relatively moderate amount of adaptation actions are underway in Tuvalu, predominately through its involvement in a number of regional climate change projects. Most of the programs focus on coastal zone management, agriculture and water—consistent with country's top three priority areas for adaptation. Tuvalu has also received funding from the Least Developed Countries Fund (LDCF) to

[236] UNFCCC, http://unfccc.int/resource/docs/natc/tuvnc1.pdf
[237] SPREP, http://www.sprep.org/att/IRC/eCOPIES/Countries/Tuvalu/42.pdf
[238] UNFCCC, http://unfccc.int/resource/docs/napa/tuv01.pdf

support implementation of the project "Increasing Resilience of Coastal Areas and Community Settlement to Climate Change," which was identified as the countries more urgent and immediate need for adaptation action in its NAPA.

Table 2: Current Adaptation Projects and Programs active in Tuvalu

Name		Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
National Action								
1.	Increasing Resilience of Coastal Areas and Community Settlements to Climate Change[239]	To increase the protection of livelihoods in coastal areas in all inhabited islands of Tuvalu from dynamic risks related to climate change and climate variability.	LDCF, co-financing *Budget:* US$ 8.196 million	UNDP	Capacity building	2009–2013	Coastal zone management	Tuvalu
Participation in Regional and Global Actions								
2.	Pacific Islands Climate Prediction Project[240]	The project aimed to expand understanding of how seasonal climate prediction services can be applied to support climate-sensitive decision making and the use of climate predictions by National Meteorological Services and industries/agencies which use climate information (e.g. farmers, tourism, water resource managers and health authorities). Along with the provision of software tailored to local circumstances and training in the effective use of climate predictions in a risk management context, the project undertook specific pilot activities.	AusAID *Budget:* AU$3.0 million	Australia Bureau of Meteorology	Research; Capacity building	Phase I: 2004–2006 Phase II: 2007–2009 (*completed*)	Climate information services	*Regional:* Cook Islands, Fiji, Kiribati, Niue, PNG, Samoa, Solomon Islands, Tonga, Tuvalu, Vanuatu
			In Tuvalu: Climate with emphasis on temperature, rainfall and tropical cyclone prediction. Various workshops and training sessions for the National Meteorological Services.[241] Participated in the pilot projects "Climate and Oceanographic Variability and their Impacts on Fisheries"[242] completed in 2005 and "Application of Climate Forecasting in Water Management"[243] completed in 2008.					

[239] AF, http://207.190.239.148/uploadedFiles/Focal_Areas/Climate_Change__(PDF_DOC)/LDCF1/Tuvalu_10-7-09_Increasisng_Resilience_Coastal_Areas.pdf
[240] BOM, http://www.bom.gov.au/climate/pi-cpp/ and ALM, http://www.adaptationlearning.net/project/pacific-islands-climate-predictions-project-pi-cpp
[241] BOM, http://www.bom.gov.au/climate/pi-cpp/tuv.shtml
[242] BOM, http://www.bom.gov.au/climate/pi-cpp/pilot_projects/fisheries_guide.shtml
[243] BOM, http://www.bom.gov.au/climate/pi-cpp/pilot_projects/water_mgt.shtml

Name		Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
3.	Regional Partnerships for Climate Change Adaptation and Disaster Preparedness[244]	The outcome is expected to be a strengthened information system that will support informed decision-making aimed at minimizing the negative social and environmental impacts of catastrophic events. It will also mitigate the financial risk of participating Pacific developing member countries to the effects of natural disasters, including those exacerbated by human-induced climate change. This work is linked to the World Bank's work on the development of a Caribbean Catastrophe Insurance Facility for the Pacific.	ADB *Budget:* US$1.0 million	World Bank	Capacity building	Phase 1: 2007–2011	Disaster risk management	*Regional:* Cook Islands, Fiji, PNG, Samoa, Solomon Islands, Tonga, Tuvalu, and Vanuatu
			In Tuvalu: Data gathering for country-specific risk models to be developed. These models will be used to assess the feasibility of catastrophe risk financing and insurance options.[245]					
4.	Pacific Islands Adaptation to Climate Change Project (PACC)[246]	PACC will implement long-term adaptation measures to increase the resilience of a number of key development sectors in the Pacific Islands to the impacts of climate change. This objective will be achieved by focusing on adaptation response strategies, policies and measures to bring about this result. The key development sectors this project will focus on are: 1. water resources management; 2. food production and food security; and 3. coastal zone and associated infrastructure (roads and breakwater). To ensure sustainability of the project, regional and national adaptation financing instruments will constitute a fourth component of the project.	SCCF, co-financing *Budget:* US$59,526,299	UNDP, ADB, SPREP	Capacity building; Policy formation and integration	2008–2012	Agriculture; Coastal zone management; Freshwater supply	*Regional:* Cook Islands, FSM, Fiji, Nauru, Palau, PNG, Solomon Islands, Tonga, Tuvalu, Vanuatu
			In Tuvalu: Demonstration measures to reduce vulnerability in coastal areas and in water management. A number of other adaptation measures implemented at the community level.					
5.	Vulnerability and Adaptation	Through this initiative, six Pacific countries	AusAID		Field	2008–2012	Multi-sectoral	*Regional:*

[244] ADB, http://www.adb.org/Projects/project.asp?id=41187
[245] ADB, http://www.adb.org/Documents/TARs/REG/41187-REG-TAR.pdf
[246] GEF, http://www.thegef.org/gef/sites/thegef.org/files/documents/document/09-16-08-SCCF.pdf

Name		Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
	Initiative[247]	have implemented activities to reduce their vulnerability to climate change and achieve good environmental outcomes. The Initiative has funded activities such as the replanting of coastal mangroves to protect shorelines, the construction of rain water tanks in islands affected by seasonal drought, the trialing of versatile crop varieties and the recording of traditional knowledge about disaster preparation.			implementation; Capacity building			Fiji, Samoa, Solomon Islands, Tonga, Tuvalu and Vanuatu
			In Tuvalu: Additional information required.					
6.	Strengthening the Capacity of Pacific Developing Member Countries to Respond to Climate Change (Phase 1)[248]	Incorporation of climate risk management, adaptation practices, and greenhouse gas mitigation measures into infrastructure and key sector investment plans and project designs. Adaptation related actions include: • Pacific Climate Change Program–will assist participating countries to improve their resilience to climate change impacts through (i) mainstreaming of the adaptation in their policies, plans, programs, and projects; and (ii) strengthening their systems and capabilities to foster the adaptation process; and • Adaptation preparation–up to five countries will be supported in preparing the implementation of climate change adaptation plans, including further capacity building	ADB, Canada *Budget:* US$4.965 million	ADB	Capacity building; Policy formation and integration	2009–?	Government	*Regional:* Cook Islands, Fiji, FSM, Kiribati, Marshall Islands, Nauru, Palau, PNG, Samoa, Solomon Islands, Tonga, Tuvalu, Vanuatu. *Plus:* Timor-Leste
			In Tuvalu: Additional information required.					

[247] AusAID, http://www.ausaid.gov.au/country/pacific/climate_change.cfm
[248] ADB, http://pid.adb.org/pid/TaView.htm?projNo=43071&seqNo=01&typeCd=2#timetable

Name		Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
7.	Coping with Climate Change in the Pacific Island Region[249]	Enhance the competence and capabilities of the local population, the national governmental authorities and regional organizations—SPC and SPREP—in order to cope with the effects of climate change and combat its causes. It includes reviewing policies and integrating adaptation considerations into them, and focuses on the management of land and coastal natural resources, as well as tourism. At the regional level, the program aligns with the Pacific Island Framework for Action on Climate Change 2006–2015. Originally only involving Fiji, Tonga, Vanuatu, the project has been expanded and extended.	German Federal Ministry for Economic Cooperation and Development *Budget:* €17.2 million	GIZ, SPC	Capacity building; Policy formation and integration; Field implementation	2009–2015	Agriculture; Forestry; Tourism	*Regional:* FSM, Fiji, Kiribati, Marshall Islands, Nauru, Palau, PNG, Samoa, Solomon Islands, Tonga, Tuvalu, Vanuatu
			In Tuvalu: Additional information required.					

D. Proposed Adaptation Action

Many of the projects outlined in Tuvalu's NAPA focus on capacity building in coastal zone management, marine resources management, human health and agriculture. Many of the projects have secondary goals of education or sustainable development (MNRE, 2007).

Table 3: Proposed Adaptation Projects from Tuvalu's NAPA (MNRE, 2007)

Name		Objectives	Type of project	Priority Sector(s)	Geographic focus (if any)
1.	Increasing Resilience of Coastal Areas and Community Settlement to Climate Change *(Funded through the LDCF)*	The two objectives of this project are: (1) increased protection of coastal areas from erosion; and (2) increased protection of coastal communities from natural phenomenon.	Knowledge communication; Capacity building	Coastal zone management	Tuvalu
			Notes: *Primary implementing agencies:* Department of Lands, Public Works Department and Island Kaupule.		

[249] GIZ, http://www.gtz.de/en/weltweit/asien-pazifik/27718.htm and SPC, http://www.spc.int/lrd/index.php?option=com_content&view=article&id=478&Itemid=44

Name		Objectives	Type of project	Priority Sector(s)	Geographic focus (if any)
			Secondary implementing agencies: Department of Agriculture and the Department of Environment and NGOs and CBOs.		
2.	Increasing Subsistence of Pit Grown Pulaka Productivity through Introduction of a Salt-tolerant Pulaka Species	The project's objectives are: (1) increase the number of abandoned pulaka pit that are re-planted; and (2) increase people's preference for fresh nutritious pulaka.	Capacity building	Agriculture	Tuvalu
			Notes: *Primary executing agencies:* Department of Agriculture and Kaupule. *Secondary executing agencies:* Department of Environment, Department of Lands, Department of Rural Development, NGOs and CBOs.		
3.	Adaptation to Frequent Water Shortages through Increasing Household Water Capacity, Water Collection Accessories, and Water Conservation Techniques	The project's objectives are: (1) increased household water storage capacity and water collecting accessories; and (2) increased use of water conservation technologies.	Capacity building	Freshwater supply	Tuvalu
			Notes: *Primary implementing agency:* Public Works Department and Kaupule. *Secondary implementing agencies:* Department of Environment, NGOs and CBOs.		
4.	Protecting community health through control of vector borne/climate sensitive diseases and promoting access to quality potable water	The project's objectives are: (1) increasing community access to clean water; and (2) controlling climate sensitive and water-borne diseases.	Capacity building	Human health; Freshwater supply	Tuvalu
			Notes: *Primary executing agencies:* Department of Health, Public Works Department, CBOs and Kaupule. *Secondary implementing agencies:* Department of Environment and NGOs		
5.	Strengthening of Community Based Conservation Programmes on Highly Vulnerable near-shore Marine Ecosystems	The project's objectives are: (1) protection of coastal marine biological diversity; (2) develop and strengthen community sustainable biodiversity conservation program; (3) increased productivity of coastal marine biological communities; and (4) develop a stakeholders awareness program that will enhance traditional and modern conservation practices.	Capacity building	Ecosystem conservation; Marine management	Tuvalu
			Notes: *Primary executing agencies:* Department of Fisheries, Department of Environment and Kaupule. *Secondary executing agencies:* NGOs and CBOs		
6.	Strengthening Community Disaster Preparedness and Response Potential	The project's objectives are: (1) to ensure community preparedness and effective response to disasters; and (2) to ensure that climate hazard risks on island communities reduced.	Capacity building	Disaster risk management	Tuvalu
			Notes: *Primary executing agencies:* National Disaster Management Office, Department of Environment and Tuvalu Meteorological Services. *Secondary implementing agencies:* NGOs, CBOs and Kaupule.		
7.	Adaptation to Coastal Shellfish Fisheries Resources Productivity	The project's objectives are: (1) increased protection of shellfish populations; (2) increased	Capacity building	Freshwater fisheries; Marine management	Tuvalu

Name		Objectives	Type of project	Priority Sector(s)	Geographic focus (if any)
		protection of coral reef ecosystems productivity; and (2) increased public awareness and livelihood.	**Notes:** *Primary implementing agency:* Department of Fisheries, Department of Environment and Kaupule. *Secondary implementing agencies:* NGOs/CBOs.		

E. Assessment

Tuvalu is involved in moderate number of adaptation projects, the vast majority of which involve multiple countries. These are helping it meet its key adaptation needs in the areas of coastal zone resources, agriculture and water. Action is also occurring in areas such as fisheries and disaster risk reduction. However, gaps appear to exist with respect to adaptation action that targets gender disparities, human health and marine resource management concerns. Further implementation of the project identified in Tuvalu's NAPA should help the country develop socially and economically while making changes that will help the country to adapt to climate change.

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14.0 Vanuatu

ADB	Asian Development Bank
AusAID	Australian Agency for International Development
DCCEE	Department of Climate Change and Energy Efficiency (Australia)
DFID	Department for International Development (United Kingdom)
DRR	disaster risk reduction
FSM	Federated States of Micronesia
GCCA	Global Climate Change Alliance
GEF	Global Environment Facility
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
ICZM	Integrated Coastal Zone Management
IUCN	International Union for the Conservation of Nature
IWRM	Integrated Water Resources Management
LDCF	Least Developed Countries Fund
NACCC	National Advisory Council on Climate Change
NAPA	National Adaptation Programme of Action
NCCAS	National Climate Change Adaptation Strategy
PACC	Pacific Islands Adaptation to Climate Change Project
PNG	Papua New Guinea
SCCF	Special Climate Change Fund
SPC	Secretariat of the Regional Pacific Community
SPREP	Secretariat of the Pacific Regional Environment Programme
UKFCO	United Kingdom Foreign and Commonwealth Office
UNDP	United Nations Development Programme
VMS	Vanuatu Metorological Services
WHO	World Health Organization

Vanuatu is an archipelago of approximately 80 volcanic islands, with an area of approximately 12,336 square kilometers located off the north-eastern coast of Australia. The island's population of approximately 221,000 individuals is predominantly rural and relies mostly on agriculture, tourism, raising cattle and offshore financial services (UKFCO, 2011).

A. Adaptation Needs and Priorities

The major climate change concerns of Vanuatu are projected sea level rise, sea temperature rise and the possible increase in cyclones and other major storm events. Based on these projections, Vanuatu has identified the following sector-based needs to reduce its vulnerability to the impacts of climate change (VMS, 1999; NACCC, 2007):

- *Agriculture:* The diversification of crops to help increase the resilience of agricultural systems to climatic extremes; and better understanding of horticulture in the face of changes in productivity, pests/pathogens and the growth requirements of subsistence crops.
- *Human Health:* Furthering the work that has already been done in environmental management to aid in the control of malaria, dengue and filiarisis; researching proper waste disposal to minimize contamination in the face of cyclones/floods; and management of surface water to maintain quality and supply.
- *Freshwater Resources:* Management of water catchments to minimize pressure on groundwater resources; reducing vulnerability of the water supply in rural and urban areas; water conservation efforts; and expansion of rainwater storage capacity through rainwater harvesting.
- *Coastal Developments:* Modeling of the storm surge zone with consideration of sea level rise; planning initiatives for infrastructure to be able to withstand cyclones, high floodwater flows and high intensity rainfall; exclusion of extractive activities from the coastal zone; replanting littoral vegetation in cleared and degraded areas; identifying areas that are highly vulnerable and planning for worst case impacts to communities; and technical planning for relocation of communities.
- *Coastal Marine Environments:* Community based marine resource management programs that consider modern and traditional management strategies and aquaculture; and planning around local economic opportunities that are an alternative to the harvesting of marine resources in the face of rising sea levels, greater concentrations of marine carbon dioxide and rising marine temperatures.
- *Forestry:* Promoting sustainable forestry management.
- *Social and Cultural Concerns:* Identification of coping strategies for the impacts of climate change on food security, land resources and water availability; and fostering collaboration between social institutions to identify and prioritize social vulnerabilities.

- *Broad Economic Impacts:* Expanding the range of agricultural products; selection of plant varieties that are better suited to predict future climates; identifying opportunities to reduce reliance on coastal marine resources; relocating infrastructure to areas of low vulnerability; and introducing sustainable tourism programs.

B. National Level Policies and Strategic Documents

Adaptation action in Vanuatu is facilitated in part by the active National Advisory Council on Climate Change (NACCC). This Council was established as part of the Pacific Islands Climate Change Assistance Project initiated in 1995 with financing from the Global Environment Facility (GEF) and implemented by the United Nations Development Programme (UNDP).

Vanuatu submitted its Initial National Communication to the United Nations Framework Convention on Climate Change in 1999 (VMS, 1999) and is currently in the process of preparing its Second National Communication. Reflecting its status as a least developed country, Vanuatu developed a National Adaptation Programme of Action (NAPA) that was submitted in 2007 (NACCC, 2007). There is emphasis on the melding of modern and traditional management approaches throughout the NAPA. These documents provide a basis for adaptation planning in the country. The Vanuatu government also is presently preparing its first National Climate Change Adaptation Strategy as part of the "Coping with Climate Change in the Pacific Islands Region Programme." The strategy is expected to build upon and synthesize the NAPA and Vanuatu's Disaster National Action Plan into a long term action plan (SPC, 2011).

Table 1: Key Government Policies and Reports reflecting Adaptation Needs, Priorities and Planned Actions

Name of Policy Action		Government Division Responsible	Status	Sector(s) of Focus	Summary description
1.	Vanuatu National Communication to the Conference of the Parties to the United Nations Framework Convention on Climate Change	Vanuatu Meteorological Services (VMS)	Released in September 1999	Multi-sectoral	The background of Vanuatu's economic and social structure is outlined. The main vulnerabilities and adaptation opportunities are discussed on a sectoral basis, namely: agriculture, human health, water resources, coastal management and fisheries. Anticipated sociocultural impacts are also discussed. The capacity that Vanuatu, its provinces and communities have to respond to climate change is examined. A national response to climate change action plan is also outlined with specific measures for adaptation (and mitigation).

Name of Policy Action		Government Division Responsible	Status	Sector(s) of Focus	Summary description
2.	National Adaptation Programme for Action[250]	VMS and Vanuatu Ministry of Infrastructure and Public Utilities	Released in December 2007	Multi-sectoral	This document outlines several in-depth adaptation strategies for the focus sectors like agriculture, water management, tourism, marine resources and forestry. There is emphasis on the melding of modern and traditional management throughout the document.
3.	National Climate Change Adaptation Strategy[251]	Government of Vanuatu	In development	Multi-sectoral	This strategy is being developed by representatives of government departments responsible for land-based resources (e.g., agriculture, forestry, meteorology) in consultations with communities.

C. Current Adaptation Action

A high level of adaptation action is taking place in Vanuatu at present, relative to other Pacific Island countries. This degree of activity stems mostly from its involvement in many of the regional programs taking place in the Pacific. Capacity building and research are common components of these projects; some also are implementing pilot adaptation actions. The sectors most frequently being addressed through these projects are coastal zone management, agriculture, disaster risk reduction and policy and planning. The Asian Development Bank (ADB), Australia and Germany are financing multiple projects in Vanuatu. Vanuatu has also received funding from the Least Developed Countries Fund (LDCF) to support implementation of the project "Increasing Resilience to Climate Change and Natural Hazards," which incorporates many of the priority activities identified in its NAPA.

Table 2: Current Adaptation Projects and Programs active in Vanuatu

Name		Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
National Action								
1.	Increasing Resilience to Climate Change and Natural Hazards[252]	Climate resilience and disaster risk reduction strengthened in key sectors in Vanuatu by promoting a risk management approach to	LDCF, co-financing	World Bank; Vanuatu Meteorological	Capacity building; Field implementati	2010–2014	Multi-sectoral	Vanuatu

[250] UNFCCC, http://unfccc.int/resource/docs/napa/vut01.pdf
[251] SPC, http://www.spc.int/en/component/content/article/216-about-spc-news/745-adapting-to-climate-change-in-vanuatu.html

Name		Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
		reduce vulnerabilities. The project includes implementation of climate resilience measures in targeted sectors.[253]	*Budget:* US$6.21 million	Service	on			
Participation in Regional and Global Actions								
2.	Pacific Islands Climate Prediction Project[254]	The project aimed to expand understanding of how seasonal climate prediction services can be applied to support climate-sensitive decision making and the use of climate predictions by National Meteorological Services and industries/agencies which use climate information (e.g. farmers, tourism, water resource managers and health authorities). Along with the provision of software tailored to local circumstances and training in the effective use of climate predictions in a risk management context, the project undertook specific pilot activities.	AusAID *Budget:* AU$3.0 million	Australia Bureau of Meteorology	Research; Capacity building	Phase I: 2004–2006 Phase II: 2007–2009 (*completed*)	Climate information services	*Regional:* Cook Islands, Fiji, Kiribati, Niue, PNG, Samoa, Solomon Islands, Tonga, Tuvalu, Vanuatu
			In Vanuatu: In the first phase of the project, data will be gathered for catastrophe risk models in each country, and country-specific loss risk profiles will be created in order to assess the feasibility of catastrophic risk financing and insurance options. This information was to support the World Bank's Pacific Catastrophe Risk Pool Initiative.[255] Also participated in the pilot projects "Climate and Oceanographic Variability and their Impacts on Fisheries"[256] completed in 2005 and "Application of Climate Forecasting in Water Management"[257] completed in 2008.					
3.	Regional Partnerships for Climate Change Adaptation	The outcome is expected to be a strengthened information system that will	ADB	World Bank	Capacity building	Phase 1: 2007–2011	Disaster risk management	*Regional:* Cook Islands,

[252] LDCF, http://207.190.239.148/uploadedFiles/Focal_Areas/Climate_Change__(PDF_DOC)/LDCF1/Vanuatu_10-28-08_Increasing_Resilience_CC_Natural_Hazards.pdf

[253] These targeted measures are to achieve: (a) sustainable livelihood practices that enhance farmers' resilience to cope with climate change; (b) integration of climate change risks, preparedness and mitigation in protected area/reserves and watershed planning; (c) adaptive capacity of coastal communities increased; and (d) climate and disaster risk concerns guide development of new tourism infrastructure.

[254] BOM, http://www.bom.gov.au/climate/pi-cpp/ and ALM, http://www.adaptationlearning.net/project/pacific-islands-climate-predictions-project-pi-cpp

[255] ADB, http://www.adb.org/Documents/TARs/REG/41187-REG-TAR.pdf

[256] BOM, http://www.bom.gov.au/climate/pi-cpp/pilot_projects/fisheries_guide.shtml

[257] BOM, http://www.bom.gov.au/climate/pi-cpp/pilot_projects/water_mgt.shtml

Name		Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
	and Disaster Preparedness[258]	support informed decision-making aimed at minimizing the negative social and environmental impacts of catastrophic events. It will also mitigate the financial risk of participating Pacific developing member countries to the effects of natural disasters, including those exacerbated by human-induced climate change. This work is linked to the World Bank's work on the development of a Caribbean Catastrophe Insurance Facility for the Pacific.	*Budget:* US$1.0 million					Fiji, PNG, Samoa, Solomon Islands, Tonga, Tuvalu, and Vanuatu
			In Vanuatu: Data gathering for country-specific risk models to be developed. These models will be used to assess the feasibility of catastrophe risk financing and insurance options.[259]					
4.	Global Climate Change Alliance[260]	The Global Climate Change Alliance seeks to deepen the policy dialogue between the European Union and developing countries on climate change; and to increase support to target countries to implement priority adaptation and mitigation measures, and integration climate change into their development strategies. The program's five priority areas for funding are: improving the knowledge base of developing countries to the effects of climate change; promoting disaster risk reduction; mainstreaming climate change into poverty reduction development strategies; reducing emissions from deforestation and degradation; and enhancing participation in the Clean	European Commission, Czech Republic, Sweden, 10th European Development Fund *Budget:* €140 million	National Governments	Policy formation and implementation; Knowledge communication	2008–ongoing	Disaster risk management; Government	*Global: 18 countries*[261] *including:* Solomon Islands, Vanuatu and the Pacific Region as a whole
			In Vanuatu: The GCCA is helping Vanuatu's government to enhance its capacity to cope with effects of climate change by improving overall understanding of the effects of climate change and strengthening climate resilience and disaster risk reduction in key sectors. It is assisting the Government of Vanuatu in policy development on climate					

[258] ADB, http://www.adb.org/Projects/project.asp?id=41187
[259] ADB, http://www.adb.org/Documents/TARs/REG/41187-REG-TAR.pdf
[260] GCCA, http://www.gcca.eu/pages/1_2-Home.html
[261] These countries are: Bangladesh, Belize, Cambodia, Ethiopia, Guyana, Jamaica, Maldives, Mali, Mozambique, Mauritius, Nepal, the Pacific Region, Rwanda, Senegal, Seychelles, Solomon Islands, Tanzania and Vanuatu

Name		Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
		Development Mechanism.	change; increasing resilience to climate change and natural hazards by improving farm practices; developing early warning systems for farmers in case of flooding; scaling up good practices for water security; and promoting, as well as developing, natural resources conservation and rehabilitation.[262] • *Budget:* €€5.5 million • *Timeline:* 2010–2014					
5.	Pacific Islands Adaptation to Climate Change Project (PACC)[263]	PACC will implement long-term adaptation measures to increase the resilience of a number of key development sectors in the Pacific Islands to the impacts of climate change. This objective will be achieved by focusing on adaptation response strategies, policies and measures to bring about this result. The key development sectors this project will focus on are: 1. water resources management; 2. food production and food security; and 3. coastal zone and associated infrastructure (roads and breakwater). To ensure sustainability of the project, regional and national adaptation financing instruments will constitute a fourth component of the project.	SCCF, co-financing *Budget:* US$59,526,299	UNDP, ADB, SPREP	Capacity building; Policy formation and integration	2008–2012	Agriculture; Coastal zone management; Freshwater supply	*Regional:* Cook Islands, FSM, Fiji, Nauru, Palau, PNG, Solomon Islands, Tonga, Tuvalu, Vanuatu
			In Vanuatu: Demonstrate measures to reduce vulnerability in coastal areas; implement policy changes to deliver immediate vulnerability- reduction benefits in context of emerging climate risks; improve capacity to plan for and respond to changes in climate-related risks; develop their technical and institutional capacities to design and implement multi-stakeholder decision-making in the redesign and relocation of roads due to the impacts of climate change; and demonstrate the integration of climate change risk reduction in road design in Epi, Shefa Province. • *Lead Implementing Agency:* Public Works in collaboration with the Department of Meteorology					
6.	Vulnerability and Adaptation Initiative[264]	Through this initiative, six Pacific countries have implemented activities to reduce their vulnerability to climate change and achieve	AusAID		Field implementation; Capacity	2008–2012	Multi-sectoral	*Regional:* Fiji, Samoa, Solomon

[262] GCCA, http://www.gcca.eu/cgi-bin/datadirs.pl?&lg=2&id_datadir_family=1&extlink=8&sw=detail&id_datadir_sheet=8
[263] GEF, http://www.thegef.org/gef/sites/thegef.org/files/documents/document/09-16-08-SCCF.pdf
[264] AusAID, http://www.ausaid.gov.au/country/pacific/climate_change.cfm

Name		Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
		good environmental outcomes. The Initiative has funded activities such as the replanting of coastal mangroves to protect shorelines, the construction of rain water tanks in islands affected by seasonal drought, the trialing of versatile crop varieties and the recording of traditional knowledge about disaster preparation.			building			Islands, Tonga, Tuvalu and Vanuatu
			In Vanuatu: more information needed.					
7.	Coastal and Marine Resources Management in the Coral Triangle of the Pacific (under the Pacific Alliance for Sustainability Program and the Coral Triangle Initiative)[265]	To promote the conservation and sustainable use of globally significant coastal and marine resources in the Coral Triangle region through the introduction of integrated and ecosystem-based coastal and marine resources management in five Pacific countries. Includes the implementation of pilot adaptation measures to enhance resilience and increase capacity to respond to the adverse impacts of climate change on coastal and marine ecosystems.	GEF-SPA; Japan; Australia; United States *Budget:* US$27,568,183	ADB	Capacity building, Research; Field implementation	2008–2013	Coastal zone management; Marine management	*Regional:* FSM, Fiji, Palau, PNG, Solomon Islands and Vanuatu *Plus:* Timor-Leste
			In Vanuatu: more information needed.					
8.	Strengthening the Capacity of Pacific Developing Member Countries to Respond to Climate Change (Phase 1)[266]	Incorporation of climate risk management, adaptation practices, and greenhouse gas mitigation measures into infrastructure and key sector investment plans and project designs. Adaptation related actions include: • Pacific Climate Change Program–will assist participating countries to improve their resilience to climate change impacts through (i) mainstreaming of the adaptation in their policies, plans,	ADB, Canada *Budget:* US$4.965 million	ADB	Capacity building; Policy formation and integration	2009–?	Government	*Regional:* Cook Islands, Fiji, FSM, Kiribati, Marshall Islands, Nauru, Palau, PNG, Samoa, Solomon Islands,

[265] GEF, http://www.gefonline.org/projectDetailsSQL.cfm?projID=3591
[266] ADB, http://pid.adb.org/pid/TaView.htm?projNo=43071&seqNo=01&typeCd=2#timetable

Name		Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
		programs, and projects; and (ii) strengthening their systems and capabilities to foster the adaptation process; and • Adaptation preparation–up to five countries will be supported in preparing the implementation of climate change adaptation plans, including further capacity building						Tonga, Tuvalu, Vanuatu. *Plus:* Timor-Leste
			In Vanuatu: To be determined					
9.	Pacific Mangroves Initiative[267]	In this project data will be collected and analyzed to identify climate risks and assist participating countries to create policies for management and restorations of mangroves and associated ecosystems. Public awareness will also be part of the project.	German Federal Environment Ministry *Budget:* €2,297,249	IUCN, University of the South Pacific, SPREP	Research; Capacity building	2009–2013	Coastal zone management; Government	*Regional:* Fiji, Samoa, Solomon Islands, Tonga, Vanuatu
			In Vanuatu: To be determined					
10.	Coping with Climate Change in the Pacific Island Region[268]	Enhance the competence and capabilities of the local population, the national governmental authorities and regional organizations—SPC and SPREP—in order to cope with the effects of climate change and combat its causes. It includes reviewing policies and integrating adaptation considerations into them, and focuses on the management of land and coastal natural resources, as well as tourism. At the regional level, the program aligns with the Pacific	German Federal Ministry for Economic Cooperation and Development *Budget:* €17.2 million	GIZ, SPC	Capacity building; Policy formation and integration; Field implementation	2009–2015	Agriculture; Forestry; Tourism	*Regional:* FSM, Fiji, Kiribati, Marshall Islands, Nauru, Palau, PNG, Samoa, Solomon Islands, Tonga,

[267] BMU, http://www.bmu-klimaschutzinitiative.de/en/projects?p=1&d=525
[268] GIZ, http://www.gtz.de/en/weltweit/asien-pazifik/27718.htm and SPC, http://www.spc.int/lrd/index.php?option=com_content&view=article&id=478&Itemid=44

Name		Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
		Island Framework for Action on Climate Change 2006–2015. Originally only involving Fiji, Tonga, Vanuatu, the project has been expanded and extended.						Tuvalu, Vanuatu
			In Vanuatu: Pilot projects undertaken as part of this project include the development of radio programming on climate change and, on the island of Pele, formation of a forestry association to promote reforestation and income generation.[269]					
11.	Cities and Climate Change Initiative Asia Pacific[270]	This initiative aims to strengthen the climate change response of cities and local governments. The main objectives are to: promote active climate change collaboration between local governments and associations; to enhance policy dialogue on climate change; to support local governments in preparing climate action plans; and to foster awareness, education and capacity building.	UN-Habitat *Budget:* US$10 million	Local governments, universities	Capacity building; Knowledge communication; Policy formation and integration	2010–?	Urban areas	*Asia Pacific:* China, Fiji, Indonesia, Mongolia, Nepal, Papua New Guinea, Samoa, Sri Lanka, Vanuatu and Viet Nam
			In Vanuatu: provide information on their project's objectives to the National Advisory Committee on Climate Change (NACCC) for cooperation and integration with the national and local governments and international stakeholders; conduct assessments on climate risk and mitigation initiatives; introduce climate change to existing plans and strategies; educational awareness on climate change, literature review on recent studies and commitments on rapid urbanization.[271]					

D. Proposed Adaptation Action

Vanuatu's NAPA identifies several priority areas and projects for climate change adaptation. Many of the programs have cross-sectoral benefits, have a focus on sustainable economic development, and include traditional ecological knowledge and/or community involvement (NACCC, 2007). Many of these proposed adaptation actions are currently being implemented through the country's LDCF financed project.

[269] GIZ, http://www.gtz.de/en/weltweit/asien-pazifik/27718.htm
[270] CCCI, http://www.fukuoka.unhabitat.org/programmes/ccci/index_en.html
[271] UN-Habitat, http://www.fukuoka.unhabitat.org/programmes/ccci/pdf/Port_Vila_flyer_July_2010.pdf

Table 3: Proposed Adaptation Projects from the Vanuatu's NAPA (NACCC, 2007)

Name		Objectives	Type of project	Priority Sector(s)	Geographic focus (if any)
1.	Agriculture and Food Security	The overall goal of the project is to enhance food security and hence the resilience of the economy to the adverse effects of climate change.	Capacity building	Agriculture	Vanuatu
			Notes: The project will be implemented by the Department of Agriculture and Rural Development under the Technical Section.		
2.	Sustainable Tourism Development	Enhance adaptation to climate change in the tourism sector for Vanuatu.	Capacity building	Tourism	Vanuatu
			Notes: The project will be executed by the National Tourism Development Office and the Vanuatu Tourism Office, which will work closely with the Vanuatu Hotel and Resort Association, Chamber of Commerce and Ministry of Tourism. The overall guidance for the project will be provided by NACCC.		
3.	Community Based Marine Resource Management Programs	Enhance adaptive capacity and resilience of vulnerable communities to the impacts of climate change. To develop community based marine resource programs, embracing both traditional and modern practices.	Capacity building; Community based adaptation	Marine management	Vanuatu
			Notes: The project will be executed by the Department of Fisheries in close consultation with other departments and ministries engaged in activities related to the coastal zones and marine issues.		
4.	Sustainable Forestry Management	To mainstream climate change issues in the country's sustainable forest management policies and practices.	Policy formation and integration	Forestry	Vanuatu
			Notes: The Department of Forestry will have the overall mandate for the project which will be undertaken in consultation with the Departments of Agriculture, Livestock, Lands and Environment. NACCC will serve as the Advisory Committee for the project		
5.	Integrated Water Resource Management	Enhanced resilience of watershed through integrated water resource management.	Capacity building; Community based adaptation	Watershed management	Vanuatu
			Notes: The project will be implemented by the Departments of Geology, Mines and Water Resources and Agriculture, working closely with the Departments of Forestry, Lands and Environment, with NACCC acting as the Advisory Committee		

E. Assessment

Through its National Communication and NAPA, Vanuatu has identified the following as priority areas for adaptation: agriculture, human health, water, coastal resources, coastal marine environments, forestry, social and cultural impacts, and addressing the broader economic impacts of climate change. Much of the adaptation underway in the country addresses these concerns—particularly those

related to agriculture, coastal resources and disaster risk reduction. Adaptation action is also taking place in a range of other sectors, such as urban adaptation, education, and conservation. Gaps appear to the absence of adaptation action directly specifically at the health needs of Vanuatu's population in a changing environment, gender disparities and marine resource management. At the policy level, the government has established a foundation for future action that will be enhanced through completion of its National Climate Change Adaptation Strategy, and appears to be committed to the planning and execution of climate change adaptation programs.

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