

CLIMATE CHANGE PROFILE



FEDERATED STATES OF MICRONESIA

VERSION 2, JULY 2013

GLOBAL CLIMATE CHANGE ALLIANCE: PACIFIC SMALL ISLAND STATES PROJECT





Federated States of Micronesia États fédérés de Micronésie



Contents

ACRONYMS	4
OBJECTIVE OF THE CLIMATE CHANGE PROFILE	5
COUNTRY BACKGROUND	5
Government	5
National and Sector Policies and Strategies	6
Economy	7
Financial Management	8
Aid Delivery and Donor Support	9
RESPONSE TO CLIMATE CHANGE	9
Current and Future Climate	9
Current Climate.....	9
Expected Future Climate.....	10
Institutional Arrangements for Climate Change	12
Ongoing Climate Change Adaptation Activities	12
National Climate Change Priorities	17
Gaps and Constraints	Error! Bookmark not defined.
Annex 1 State Profiles	19
KOSRAE STATE	19
POHNPEI STATE	20
CHUUK STATE	20
YAP STATE	21
References	22

Acronyms

ADB	Asian Development Bank
ADF	Asian Development Fund
CCCPIR	Coping with Climate Change in the Pacific Island Region project implemented in partnership with Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) on behalf of the German Federal Ministry for Economic Cooperation and Development (BMZ)
CSP	Conservation Society of Pohnpei
ENSO	El Niño Southern Oscillation
EPA	Environment Protection Agency
FFA	Forum Fisheries Agency
FSM	Federated States of Micronesia
GCCA: PSIS	Global Climate Change Alliance: Pacific Small Island States Project
GDP	Gross Domestic Product
GEF	Global Environment Facility
IMF	International Monetary Fund
IOM	International Organization for Migration
MC	Micronesia Challenge
MCT	Micronesia Conservation Trust
MDG	Millennium Development Goals
MHMP	Multi-State Hazard Mitigation Plan
PACC	Pacific Adaptation to Climate Change Project
PACCSAP	Pacific Australia Climate Change Science and Adaptation Planning Project
PEFA	Public Expenditure and Financial Accountability Framework Assessment
PFM	Public Financial Management system
PIFS	Pacific Islands Forum Secretariat
SDP	Strategic Development Plan
SDP/IDP	Strategic Development Plan/Infrastructure Development Plan
SPC	Secretariat of the Pacific Community
SPREP	Secretariat of the Pacific Environment Programme
TNC	The Nature Conservancy
UNDP	United Nations Development Programme
UNFCCC	United Nations Framework Convention on Climate Change
WSO	Weather Service Office

OBJECTIVE OF THE CLIMATE CHANGE PROFILE

This second version of the climate change profile for the Federated States of Micronesia (FSM) has been prepared as part of the Secretariat of the Pacific Community's (SPC) Global Climate Change Alliance: Pacific Small Islands States (GCCA: PSIS) project. The Coping with Climate Change in the Pacific Island Region (CCCPIR) project funded by Germany (GIZ) also assisted with the preparation. The goal of the GCCA: PSIS project is to support the governments of nine Pacific smaller island states, namely Cook Islands, Federated States of Micronesia, Kiribati, Marshall Islands, Nauru, Niue, Palau, Tonga and Tuvalu, in their efforts to tackle the adverse effects of climate change. The purpose of the project is to promote long term strategies and approaches to adaptation planning and pave the way for more effective and coordinated aid delivery on climate change, including the delivery of streamlined adaptation finance, at the national and regional level.

This climate change profile is specific in nature and seeks to inform the GCCA: PSIS project as well as the larger SPC climate change support team. It commences with a section on the country's background, including geography, economy, financial management and aid delivery. This is followed by a section focusing on the country's response to climate change, including climate change projections, institutional arrangements, ongoing adaptation activities and climate change priorities. The profile is a work in progress and will be revised and enhanced as the project develops.

COUNTRY BACKGROUND

Country Information ⁱ	
Geographic coordinates	Lat. 1°S - 14°N, Long. 135°W - 166°E
Total land area	701km ²
Length of coastline	6112km
Exclusive Economic Zone area	2,980,000km ²
Population (2011 estimate)	102,360
Population forecast (2015)	100,609
Annual population growth rate	0.4%
Population density	146 people per km ²
Access to improved water supply (2006 est.)	94 % ^{1a}
Access to improved sanitation facilities (2013 est.)	26% ^{ib}
Human Development Index	0.645 ^{ii 1}

FSM is a group of 607 islands in the western Pacific Ocean. These islands vary in size from small islets that disappear at high tide to atolls to large volcanic islands of more than 80km². Approximately 65 of the islands are inhabited. The most striking physical characteristic of the FSM is the small land area spread over a great expanse of water.ⁱⁱⁱ The country is comprised of four states: Chuuk, Kosrae, Pohnpei and Yap which each have a considerable degree of autonomy. Annex 1 provides provided further details about the individual states.

Government

FSM was administered by Spain, Germany, Japan and the USA before establishing a constitution and achieving independence in 1986. It joined the United Nations in 1991. The FSM is a constitutional democracy in free association with the United States with a national government supporting four relatively autonomous state governments: Chuuk, Pohnpei, Yap and Kosrae. The population is predominantly Micronesian but there are some Polynesian enclaves. The capital is in Pohnpei and the SPC North Pacific Regional Office is also located here. The country's government is modelled after the federal system of the United States

with a national president and four state governors with respective legislatures and judiciaries.^{iv}

Table 1: Key National Cabinet Members:

Executive Branch	
Office of the President	
Department of Education	DOE
Department of Finance and Administration	F&A
Department of Foreign Affairs	FA
Department of Health and Social Affairs	DHSA
Department of Justice	DOJ
Office of Public Defender	OPD
Department of Resource & Development	R&D
Department of Transportation, Communication, and Infrastructure	TC&I
Office of Environment & Emergency Management (OEEM)	OEEM
Office of Statistics, Budget & Economic Management, Overseas Development Assistance & Compact Management (SBOC)	SBOC
Office of National Archives, Culture & Historic	NACH
National Independent Agencies – these government agencies have functions that provide oversight of government that relate to climate change	
Coconut Development Authority	CDA
College of Micronesia-FSM	COM-FSM
FSM Development Bank	FSMDB
FSM Social Security Administration	SSA
FSM Telecommunications Corporation	FSMTC
FSM Banking Board	
FSM Election Office	
FSM Insurance Board	
FSM Postal Service	FSMPS
FSM Social Security	FSMSS
MiCare Health Insurance	
National Fisheries Corporation	NFC
National Oceanic Resource Management Authority	NORMA
Public Auditor	

National and Sector Policies and Strategies

Each FSM state has its own set of environmental laws and regulations geared to protect the islands from the effects of climate change. Under the Compact II, Article VI and section 161 of Title II, FSM is committed to applying the National Environmental Policy Act of 1969 and “to develop and implement standards and procedures to protect its environment.”

The FSM government has put in place national frameworks for adaptation: The Strategic Development Plan (SDP) and the Infrastructure Development Plan (IDP) are based on several frameworks which provide mitigation and adaptation measures to limit the impacts of climate change. Mitigation and Adaptation activities are on-going at the government and agency sectors.

The Strategic Development Plan (SDP) for FSM provides a road map for social and economic development for the 20 years, 2004 - 2023.^v

The SDP has four main objectives:

- 1) Stability and security - to maintain economic assistance at levels that support macroeconomic stability; achievement of this objective requires levels of funding close to prevailing levels, to avoid the large periodic step downs in funding that were a characteristic of the first 14- year Compact funding package.
- 2) Improved enabling environment for economic growth - to be achieved through the FSM commitment to economic reform and the provision of an enabling environment to support open, outward - oriented and private sector led development.
- 3) Improved education and health status – use of the annual Compact grant to support the provision of basic services in education and health.
- 4) Assured self - reliance and sustainability - to be achieved through establishment of a Trust Fund that would, after a period of time, replace the annually appropriated transfers from the US.

A Council on Environmental Management and Sustainable Development (or Sustainable Development Council) chaired by the Vice-President was established through Presidential Order No. 14. The functions and purposes of the Sustainable Development Council are to advise and make recommendations to the President on matters affecting the environmental management and sustainable development of the FSM. The Sustainable Development Council had not been very active since inception and the coordination of climate change has been mainly through the Climate Change Country Team^{vi}.

Economy

Economic Information	
Gross Domestic Product (GDP) (2009)	USD\$274 million
GDP per capita (2009)	USD \$2,476.
Annual growth (2007):	-3.2%
Inflation rate (2007):	2.8%
Unemployment rate (2000 estimate):	22%

The mainstays of the Micronesian economy are subsistence farming and fishing. There is limited tourism in the area due to lack of access and facilities. Geographical isolation and poorly developed infrastructure are major impediments to FSM's long-term growth. Over the years, agriculture's socio-cultural role as a safety net for the disadvantaged has greatly diminished. Inequality of income and the incidence of families with incomes below the poverty line are among the highest in the Pacific region. Poverty is a concern and FSM has, in general, made only limited progress towards achieving the Millennium Development Goals (MDGs) by 2015.^{vii}

In recent years, FSM has earned between US\$18 and 24 million annually from licensing fees paid by foreign vessels fishing for tuna in the country's Exclusive Economic Zone. Some locally-owned fishing operations and on-shore processing have also been initiated, along with farming of giant clams and other marine products. Small scale commercial agriculture has had some successes, especially in niche export markets, e.g. kava (sakau), betel nut, black pepper, cooked breadfruit, and processed noni.

Tourism has increased in recent years with a number of small hotels opening in Pohnpei, Yap and Kosrae, some with facilities for diving. However, large-scale investment in this sector is constrained by limitations in air transportation, land-use issues and competition with other countries that are closer to major tourist markets.^{viii}

The FSM government sector plays a central role in the economy; the national and state-level governments employ over half of the country's workers and Government services and public enterprises account for 38% of GDP. Since the 1995 Economic Summit, the private sector has been a focus of economic development. There are now 22 private, locally-owned construction companies. All road maintenance is performed by locally-owned companies. The Telecommunications Corporation has been privatized as has the Pohnpei Public Utilities Corporation. This has resulted in more reliable power and water in the capital.

FSM's external transactions continue to be characterised by a heavy and increasing reliance on imports without a comparable increase in exports. In 2004, the country had a negative trade balance of more than USD \$130 million. The total value of exports, including tourism, is only around 10% of the value of imports.

The Asian Development Bank's (ADB) Country Operations Business Plan indicates that in 2010, the economy grew by an estimated 4%, supported mainly by public sector infrastructure investments, the reopening of a fish processing and cold storage plant in Kosrae, and rising agriculture production. The sectors that seem to offer the greatest potential for near-term income generation are fisheries and tourism. Agriculture also has some potential, especially for inter-island trade, but the small land area available for larger-scale farming will always be a constraint. The country also possesses high-grade deposits of phosphate.

The ADB analysis indicated economic growth in the medium term is not expected to exceed 0.6%. This is due to a number of factors including limited new private sector initiatives, scheduled decline in the annual Compact of Free Association grants, outward migration and volatility of commodity prices.

Financial Management

According to the ADB the FSM continues to exhibit the characteristics of a fragile state. Development management capacity is limited, and governance systems are underdeveloped. However they do indicate reform initiatives have been undertaken in recent years to improve fiscal prudence, economic stability, and to support sustainable growth; including reform of state specific financial management and the national taxation system. Improving the efficiency and effectiveness of FSM national and state governments is a national priority to achieve economic sustainability.

The 2011 International Monetary Fund (IMF) analysis found the banking sector remains liquid, but contributes little to economic growth. Activities by the public development bank and credit unions are currently not regulated and IMF recommended they be brought under the supervision of the Banking Board. Insurance supervision has recently been separated from banking supervision, but its supervisory capacity is inadequate, particularly in the area of captive insurance.

The President of the FSM has requested support from ADB to review the structure of the three branches of the national government and develop a reform agenda. This will include a review of the government's organizational structure and systems, including the national public services system. The review will be based on constitutional mandates for the FSM and each state, the Strategic Development Plan of the FSM, and the manner in which the mandates and structures of government departments support the Strategic Development Plan and the states. Technical assistance amounting to \$0.7 million is proposed in 2012 to improve on public service delivery. Loans have been included for 2014 in the amounts of \$3.0 million from the Asian Development Fund (ADF) and \$2.0 million from ordinary capital.^{ix}

FSM's Public Expenditure and Financial Accountability (PEFA) assessment and initial public finance management (PFM) consultations are scheduled for 2012/2013. This process should provide detailed analysis of FSM's PFM and also provide an opportunity to review climate change finance options.

Aid Delivery and Donor Support

FSM currently relies on development partners to supplement its national budget. Alongside foreign earnings, development aid from foreign governments and international financial institutions plays a key role in the social and economic development of FSM. International and regional development partners provide approximately 60% of the annual government budget expenditures, equivalent to more than one-third of GDP. Of major importance is the financial grant arrangement between the governments of the United States and FSM.

FSM's relationship with the USA is formalised through the Compact of Free Association, an agreement that went into effect in 1986, was subsequently amended in 2004 and has been negotiated to extend until 2024. Under the Compact, the US pledged \$1.3 billion in aid during the period 1986 to 2001. However, by the mid-1990s, it became apparent that a variety of obstacles were hindering the pace of development, and that dependence on US aid was not diminishing at the anticipated rate. Efforts were made by the US through ADB to improve economic development and this resulted in an amended Compact.

The amended Compact provides funding for the health, education, environment and infrastructure sectors, as well as for capacity building and private sector development, but at a reduced level compared with the original Compact. It also establishes a trust fund to which the US and FSM make annual contributions, with the aim of providing annual payouts in perpetuity after 2023. However the IMF states that lower than anticipated returns on the government's trust fund imply a large projected revenue shortfall in FY2023. Closing this revenue gap would require a medium-term fiscal surplus of about 5.75% of GDP.^{iv}

The Government of FSM engages with a range of multilateral and bilateral development partners, including several United Nations agencies, such as the United Nations Children's Fund (UNICEF), United Nations Development Programme (UNDP) and United Nations Population Fund; agencies making up the Council of Regional Organisations in the Pacific (CROP), including SPC as well as the Forum Fisheries Agency (FFA); and other regional commissions such as the Western and Central Pacific Tuna Commission. Key bilateral development partners include Australia, European Union, Japan, New Zealand, China and USA. Other development partners include ADB, IMF and the World Bank. An important provision of the Compact allows FSM citizens to live and work in the USA with little restriction, which has contributed to ongoing out-migration. A Donor Forum is to be held in November 2012 which will include climate change on its agenda.

RESPONSE TO CLIMATE CHANGE

Current and Future Climate

Current Climate

In FSM there is little seasonal variation in temperature, with less than 3°F (1.5°C) between the average hottest and coolest months. The country has two distinct seasons – a wet season from November to April and a dry season from May to October. Due to the geographical spread of the islands in FSM, the climate can vary across the FSM region, and thus recent studies by the Pacific Climate Change Science Programme have divided the country on an east-west basis for analysis.^x

Rainfall in FSM is affected by the movement of the Convergence Zone (ITCZ). During the wet season, the ITCZ strengthens and moves north close to FSM. The West Pacific Monsoon also impacts rainfall, bringing additional rain during the wet season.^{xi}

FSM’s climate varies considerably from year to year due to the El Niño-Southern Oscillation (ENSO). El Niño events are associated with drier conditions and occasional droughts. Fires, water shortages and food shortages occur during severe dry events. During La Niña events above-average numbers of tropical storms occur as well as more rainfall. Droughts, typhoons, storm waves, flooding and landslides all affect FSM.

Expected Future Climate

Projections (based on the Pacific Climate Change Science Program 2011) for all emissions scenarios show that temperatures will continue to rise in FSM, as will sea level and ocean acidification. The intensity and frequency of days of extreme rainfall are projected to increase (high confidence) and tropical cyclone numbers are projected to decline in the tropical North Pacific Ocean basin (0–15°N, 130°E –180°E) (moderate confidence). As there is no consistency in projections of future ENSO activity it is not possible to determine whether interannual variability in rainfall will change in the future. However, ENSO is expected to continue to be an important source of variability for the region.

Table 2: Climate change projections for FSM for 2030 and 2055 under the high emissions scenario (A2) In the summary table differences in projections across FSM are noted Eastern (E) and Western (W).^{xiii}

Climate Variable	Expected Change	Projected Change 2030 (A2)	Projected Change 2055 (A2)	Confidence level
Surface air temperature (°C)	Average air temperature will increase	+0.7 ± 0.3°C	+1.4 ± 0.4°C	High
Maximum temperature (°C) 1-in-20-year event	Increased number of very hot days	N/A	+1.5 ± 0.5°C E +1.5 ± 0.6°C W	Low
Minimum temperature (°C) 1-in-20-year event	Decline in cooler weather	N/A	+1.4 ± 1.5°C E +1.4 ± 1.6°C W	Low
Annual total rainfall (%)	Increase in average rainfall	+4 ± 11% E +2 ± 7% W	+7 ± 11% E +4 ± 9% W	Moderate
Dry season rainfall (%) November- April	Fewer droughts expected	+4 ± 14% E +2 ± 10% W	+8 ± 18% E +5 ± 17% W	Moderate
Wet season rainfall (%) May-October	Slightly increased rainfall expected	+4 ± 12% E +2 ± 8% W	+7 ± 13% +4 ± 7%	Moderate
Annual sea-surface temperature	Sea surface temperature will increase	+0.6 ± 0.4°C E +0.7 ± 0.4°C W	+1.3 ± 0.5°C	High

Climate Variable	Expected Change	Projected Change 2030 (A2)	Projected Change 2055 (A2)	Confidence level
(°C)				
Annual maximum aragonite saturation state (Ωar)	Ocean acidification will continue to increase	+3.4 ± 0.2 Ωar E +3.3 ± 0.2 ΩarW	+3.0 ± 0.2 Ωar E +3.0 ± 0.1 ΩarW	Moderate
Annual mean sea level (cm)	Sea level will continue to rise	+6 to +24cm	+10 to +50cm	Moderate

Institutional Arrangements for Climate Change

FSM has ratified the UNFCCC and its Kyoto Protocol as well as Montreal Protocol (also known as the ozone treaty). In 2009, the FSM was awarded a Climate Protection Award from the U.S. Environmental Protection Agency for its contributions to Climate Protection under the ozone treaty.

FSM has a Multi-State Hazard Mitigation Plan 2005, which was developed after an extensive process of consultation, led by what was then the National Emergency Management Office^{xii}, involving stakeholders across all states within and outside government.

FSM has commenced integration initiatives from a common institutional platform for disaster risk reduction and climate change adaptation overseen by the Office of Environment and Emergency Management.

A Nationwide Climate Change Policy was adopted by FSM in 2009. The focus is to mitigate climate change especially at the international level, and adaptation at the national, state and community levels to reduce the FSM's vulnerability to climate change adverse impacts. The Policy outlines the integration of climate change into the Strategic Development Plan/Infrastructure Development Plan (SDP/IDP) and into other policies, strategies and action plans, including disaster preparedness and mitigation, as necessary.^{xiii} The Office of Environment and Emergency Management is designated as the focal point for all government climate change activities by law under Title 25 the FSM Environmental Protection Authority Act

The Nationwide Climate Change Policy identifies the following sectors and the agency responsible for implementing climate change adaptation actions:

- Department of Education
- Department of Health and Social Affairs
- Department of Resources and Development
- Department of Transportation, Communication & Infrastructure
- FSM Weather Service Station
- National Oceanic Resource Management Authority
- Office of Environment and Emergency Management
- Office of President

FSM is presently in the process of developing a joint policy for climate change adaptation and disaster risk management. This will be implemented through State Joint Action Plans for Climate Change and Disaster Risk Management, Different states may take different approaches such as stand-alone plans or integration into other strategies currently being pursued by States such as Kosrae.

On-going Climate Change Adaptation Activities

Title and Timeframe	Description, country focus and agencies responsible
Micronesia Challenge (MC) <i>2006 - ongoing</i>	Sub-regional conservation initiative which enhances community resiliency by using traditional knowledge and ecosystem strategies to conserve vulnerable coastal land resources by 2020; goals are to effectively conserve at least 30% of near-shore resources and 20% of terrestrial resources. The MC includes: Micronesians in Island Conservation Network (MIC); Pacific Islands Managed and Protected Area Community (PIMPAC); Locally Managed Marine Area

Title and Timeframe	Description, country focus and agencies responsible
	<p>Network – Micronesia Node (LMMA); Micronesia Challenge Young Champions</p> <p>Agencies responsible: Micronesia Chief Executives (Guam, Mariana Islands, FSM, Palau and RMI); The Nature Conservancy (TNC); NOAA. Micronesia Conservation Trust (MCT)</p>
<p>Micronesia Conservation Trust (MCT)</p> <p><i>2002 - ongoing</i></p>	<p>MCT was formally established by TNC in 2002 as a charitable and irrevocable corporation organized to manage and provide funds for the accomplishment of the following mission: “to support biodiversity conservation and related sustainable development for the people of Micronesia by providing long term sustained funding.”</p> <p>In 2006, MCT was selected as the financial mechanism for the MC and has since fully regionalized its Board and organizational structure and services.</p> <p>MCT is administered under FSM law, has a Board of Trustees.</p>
<p>Pacific Adaptation to Climate Change Project (PACC)</p> <p><i>2009 - 2013</i></p>	<p>The PACC Project is designed to promote climate change adaptation as a key pre-requisite to sustainable development in Pacific Island countries. Its objective is to enhance the capacity of the participating countries to adapt to climate change and climate variability, in key development sectors. Mainstreaming, demonstration and communications are implemented at the community and country levels. The project aims to assist FSM develop its food preservation and security needs, coastal management needs, and water management needs.</p> <p>Kosrae was chosen as pilot State focusing on coastal infrastructure e.g. roads that are already experiencing erosion from sea level rise and flooding.</p> <p>- Agencies responsible: UNDP (implementing agency); GEF, AUSAID (funding agencies); SPREP(implementing partner). FSM Kosrae Island Resource Management Authority (KIRMA)</p>
<p>International Climate Change Adaptation Initiative-Pacific Adaptation Strategy Assistance Program (ICCAI PASAP),</p> <p><i>2011-2013:</i></p>	<p>Aims to enhance the capacity of partner country to assess key vulnerabilities and risks, formulate adaptation strategies and plans and mainstream adaptation into decision making. The major output of the PASAP project is: Country (FSM)-led vulnerability assessment and adaptive strategies informed by best practice methods and improved knowledge. The project activities included community participatory surveys conducted in Yap which included Ulithi and Fais Atolls; evidence-based field research conducted on drought and salt tolerant varieties of sweet potatoes and sweet taro in Dinay and Wugeem, Yap; etc.</p> <p>Agencies responsible: Australian Department of Climate Change and Energy Efficiency (DCCEE), SPREP, SPC. COM-FSM CRE, State Departments of Agriculture, NGOs, and community members.</p>
<p>Geospatial Analysis for Food Security Adaptation</p> <p><i>2013-2015</i></p>	<p>Trying to find suitable places to relocate the agricultural areas (particularly taro) with the help of geospatial analysis (GPS, remote sensing) and geographic information systems.</p> <p>funded by a three-year, \$150,000 grant from the U.S. Forest Service</p> <p>Queens University of Charlotte, Yap State R&D</p>
<p>Pacific - Australia Climate Change Science and Adaptation Planning Program (PACCSAP)</p>	<p>PACCSAP: supporting the government of FSM develop improved climate change projections and adaptation planning activities. FSM and 14 other Pacific countries are part of this AUD\$32 million project which builds on the foundation of the Pacific Climate Change Science Programme and the Pacific Adaptation Strategy Assistance Programme.</p>

Title and Timeframe	Description, country focus and agencies responsible
2011 - 2013	Agencies responsible: AUSAID; Australian Department of Climate Change and Energy Efficiency (DCCEE); Australian Bureau of Meteorology, CSIRO, FSM OEEM
<p>Implementing Sustainable Water Resources and Wastewater Management in Pacific Island Countries (Pacific IWRM)</p> <p>2008–2013 with Phase 2 (2013-2015) and 3 (2015-2018) being planned.</p>	<p>Pacific IWRM is developing “Ridge to Reef – Community to Catchment” integrated water resource management (IWRM) activities in the 14 participating Pacific Island Countries.</p> <p>The FSM’s GEF Pacific IWRM Demonstration Project entitled “Ridge to Reef: Protecting Water Quality from Source to Sea” has strengthened national coordination in the water and sanitation sector and has enhanced community collaboration to improve water resource management. It has three main foci—(i) protected areas (improving existing ones and creating new ones), (ii) managing ecosystems outside protected areas, and (iii) improving agro ecosystems.</p> <p>Agencies responsible: GEF; SPC Applied Geosciences and Technology Division, FSM R&D</p>
<p>Water and Environmental Research Institute of the Western Pacific (WERI),</p> <p>1985 ongoing</p>	<p>Their mission is to seek solutions through research, teaching and outreach programs, to issues and problems associated with the location, production, distribution and management of freshwater resources in Micronesia. Current projects and programs include watershed management program, rooftop rain catchment sizing, groundwater and aquifer research, atoll hydrologic modelling, water quality production and distribution, water resources management and GIS.</p> <p>Agencies Responsible University of Guam, FSM? Island Research,</p>
<p>Global Climate Change Alliance: Pacific Small Island States (SPC-GCCA:PSIS)</p> <p>2011 – 2014</p>	<p>The overall objective of the GCCA: PSIS is to support the governments of nine Pacific smaller island states, including FSM, in their efforts to tackle the adverse effects of climate change. Overall available funding is 11m EUR.</p> <p>In FSM the key adaptation activity focus of the project is addressing coastal water and food security in the outlying islands of</p> <p>Agencies responsible: European Union (EU); SPC (Implementation); SPREP. FSM OEEM</p>
<p>University of the South Pacific European Union Global Climate Change Alliance Project (USP-EU GCCA Project)</p> <p>2011 – 2014</p>	<p>The USP-EU GCCA project addresses the challenges of climate change impacts in the 15 Pacific ACP countries, including FSM, through capacity building, community engagement, and applied research. The objective of this project is to develop and strengthen the Pacific ACP countries' capacity to adapt to the impacts of climate change. Overall available funding is € 8 m.</p> <p>Agencies responsible: EU;USP,.FSM- MFA?</p>
<p>North Pacific ACP Renewable Energy and Energy Efficiency Project (North-REP)</p> <p>2010 – 2014</p>	<p>The overall objective of North-REP is to improve the quality of life on the outer islands by increasing access to basic electricity and reducing dependency on fossil fuels through energy efficiency and increased penetration of matured renewable energy technologies in the North-REP countries (FSM, RMI and Palau).</p> <p>Overall available funding for FSM is 10m USD.</p> <p>Agencies responsible: EU; SPC (implementing agency); FSM R&D.</p>
Coping with Climate	CCCPIR covers 12 Pacific Island Countries and six components ranging from regional and national mainstreaming of climate change, implementation of adaptation

Title and Timeframe	Description, country focus and agencies responsible
Change in the Pacific Island Region (CCCPiR) <i>2009 – 2015</i>	activities on the ground, and climate change related to tourism, energy and education. In FSM CCCPIR is undertaking mainstreaming climate change, and integrated land and marine resource management at the national and local level. Overall available funding is 17m EUR. FSM is eligible for up to 440,000 USD depending on project design. Agencies responsible: German Ministry for Economic Cooperation and Development (BMZ, funding); German International Cooperation (GIZ, implementing agency); SPC (regional partner), FSM OEEM, R&D
ADAPT Asia – Pacific Annual Forum on Adaptation <i>2012 onwards</i>	Designed to help Asia-Pacific country governments understand the technical and scientific demands required to apply for climate finance. Agency responsible: USAID, FSM OEEM
National Climate Change and Health Action Plan (NCCHAP) <i>2010-2013</i>	Regional framework for action to protect human health from effects of climate change in the South East Asia and Pacific region. Agencies responsible: WHO, FSM DHSA, State EPAs, OEEM, WSO
Technical Assistance (TA) to the Federated States of Micronesia for Strengthening Infrastructure Planning and Implementation <i>2011-2013</i>	TA will support state utilities within the FSM) in executing infrastructure projects more effectively by having an agreed upon approach to systems and procedures for project planning, design, and management across the country; and build capacity in the Department of Transportation, Communications and Infrastructure (DTCI) to plan, design, and oversee project execution. The Government of FSM has requested ADB to finance \$700,000 equivalent. Agencies responsible: ADB, Japan Fund for Poverty Reduction, FSM TC&I
Second National Communications to the UNFCCC <i>2006-2012</i>	National obligation under the UNFCCC to produce status report on national climate change measures and priorities. FSM is using a consultative approach involving a range of stakeholders to produce this report. USD 425,000 Agencies Responsible, GEF, UNDP, FSM – OEEM, R&D, State Environmental Protection Agencies
MAPCO ₂ Project <i>2011 - ongoing</i>	A MAPCO ₂ was deployed within the Chuuk Lagoon in November 2011. The goal of this joint effort is to establish a long term monitoring station in Micronesia as part of global ocean monitoring network system for coral reef areas. Agencies responsible: NOAA's PMEL Carbon Group; Korea Ocean Research and Development Institute. FSM R&D
Pacific Islands Climate Education Partnership (PCEP) <i>2011–ongoing</i>	Educates students and citizens across the Pacific about the urgency of climate change impacts in ways that exemplify modern science and honour indigenous cultures and environmental knowledge, so that students and citizens within the region will have the knowledge and skills to improve understandings of climate change and adapt to its impacts. US National Science Foundation (NSF); WestEd, FSM OEEM, National and State Departments of Education, Pacific Resources for Education and Learning (PREL)
Unite for Climate	Children's vulnerability to climate change and disaster impacts in East Asia and the Pacific. Agency responsible: UNICEF, FSM Department of Health and Social Affairs,
Pacific Regional	Strives to enhance Pacific Island communities' abilities to understand, plan for, and

Title and Timeframe	Description, country focus and agencies responsible
Integrated Sciences and Assessments (Pacific RISA) <i>1995 -ongoing</i>	respond to a changing climate. Emphasizing the engagement of communities, governments, businesses, and scientists by translating scientific research into information and materials that are valuable for stakeholders in key sectors such as water resources. Climate focused water sector education and outreach is part of Pacific RISA's core mission . Agencies Responsible National Oceanic and Atmospheric Administration (NOAA) WSO.
Schools of the Pacific Rainfall Climate Experiment (SPaRCE) <i>1995-ongoing</i>	The SPaRCE programme seeks to increase awareness of the younger generations about global environmental issues, such as climate change, with hands-on experience by involving them in the collection of rainfall data. Agencies Responsible: University of Oklahoma, FSM DoE, WSO
Climate Adaptation, Disaster Risk Reduction and Education (CADRE) <i>2011 -2014</i>	Aims to build resilience of vulnerable communities to natural hazards particularly those that are climate induced. Will target approximately 10,000 school aged students at up to 50 schools with climate adaptation, disaster risk reduction and education program. Track 1 educational component, including capacity building of students, teachers, administrators and the local community; technical assessments of climate change impact and disaster risk on schools grounds, and the surrounding community. Track 2 roll out of adaptation measures stemming from the recommendations contained within the change impact assessments and exercising of the climate adaptation and disaster risk management plans Agencies responsible: USAID, AusAID, IOM, FSM OEEM, National and State Departments of Education
FSM Joint National Action Policy and State Action Plans for Climate Change Adaptation and Disaster Risk Management <i>2013-2018</i>	Following a request by FSM in 2012, CROP agencies are providing assistance for the FSM and its States with the development of this policy and plans. Agencies Responsible: SPC, EU, SPREP, FSM OEEM
U.S. Peace Corps Small Project Assistance (SPA) for Adaptation, <i>2013-2017</i>	This project will extend USAID's reach to remote communities by supporting the following efforts of Peace Corps volunteers: (1) development of youth camps that promote environmental awareness, knowledge and skills among the youth to become responsible natural resource stewards; (2) trainings that support community adaptation to climate change and build capacity for disaster risk reduction (DRR); and (3) small-scale community projects that can demonstrate application of climate change and DRR principles. Implementing Organization: U.S. Peace Corps, USAID, FSM

Title and Timeframe	Description, country focus and agencies responsible
Coastal Community Adaptation Project (C-CAP), 2013-2017	<p>This project aims to build the resiliency of vulnerable coastal communities in the Pacific region to withstand more intense and frequent weather events and ecosystem degradation in the short-term, and sea level rise in the long-term. The project has three components: (1) rehabilitating or constructing new, small-scale community infrastructure; (2) building capacity for community engagement for disaster prevention and preparedness; and (3) integrating climate resilient policies and practices into long-term land use plans and building standards.</p> <p>USAID Implementing Organization: Development Alternatives, Inc. (DAI), University of the South Pacific (USP); Kramer Ausenco Papua New Guinea Limited, FSM OEEM</p>
Pacific Catastrophe Risk Assessment and Financing Initiative (PCRAFI) 2007- 2015	<p>Aims to provide the Pacific Island Countries (PICs) with disaster risk modeling and assessment tools to help them better understand, model, and assess their exposure to natural disasters, and to engage in a dialogue on integrated financial solutions for the reduction of PICs financial vulnerability to natural disasters and to climate change. The initiative is part of the broader agenda on disaster risk management and climate change adaptation in the Pacific region.</p> <p>Responsible Agencies: SPC, WB and ADB, Japan, Pacific Disaster Centre, with technical inputs from GNS Science, Geoscience Australia, and AIR Worldwide</p>

National Climate Change Priorities

Climate change remains an important policy priority for the FSM. In the 2004 - 2023 SDP, Strategic Goal 1 in the Environment Section recognized the need to mainstream climate change into national planning as well as in all economic development activities. In December 2009 the President of the FSM issued an Executive Order directing all relevant sectors to update existing plans and complete them as a measure to bolster responses towards mitigating and adapting to climate change. The sectors include agriculture (and food security), energy, water, infrastructure, transport, finance, health, gender and other relevant sectors (FSM Climate Change Policy 2009^{xiv}). The SDP and the Infrastructure Development Plan (IDP) provide a strong foundation for the Nationwide Climate Change Policy focuses on the following adaptation activities:

- 1) All development agencies in FSM to take into account projected climate change in the design and implementation as stipulated in the FSM SDP/IDP.
- 2) Use ecosystem-based approaches where applicable.
- 3) Encourage and strengthen the application of traditional knowledge on conservation practices and other relevant areas.
- 4) Develop and implement appropriate strategies to improve food production and other relevant sectors.

Specific priorities include:

- Develop a national climate education program implemented through state, Non-Governmental Organizations (NGO), and community groups.
- Install and maintain climate-monitoring stations throughout FSM.

- Prepare maps of inundation risk and vulnerability and develop an inundation timeline that can inform state and national plans.
- Create a national climate risk management plan and road map for managing climate risk, supported by individual state plans that emphasize community-based adaptation.
- Build food and water resiliency.

FSM has recently completed its draft on the Second National Communications (status report on climate change) in the country to the United Nations Framework Convention on Climate Change (UNFCCC) for submission in 2012. This report captures progress on assessing and addressing climate change within FSM that has been made since the Initial National Communications was submitted in 1997 and its addendum in 1999.

Key Challenges to Adaptation

The Government of the FSM highlighted its priority needs for adaptation to climate change in the Climate Change Policy 2009 and other documents. The Nationwide Climate Change Policy, the National Biodiversity Strategy and Action Plan, the National Energy Policy and State Action Plans, and the National Action Plan to Combat Land Degradation are but a few of the National and State-level plans and policies that the FSM is implementing in order to address major threats to the sustainability and economic and social viability of the country. The FSM has made progress in addressing climate change issues, documenting the climate-related risks faced by the nation, in developing relevant policies and plans, and in establishing and strengthening National and State institutions with mandates for managing climate and related risks, including disaster risk management, with the support of its regional and international development partners. However, some key challenges still remain and will compromise future long term efforts unless effectively addressed.

Climate change events, chronic problems, data gaps, lack of master planning, breakdowns in coordination between national and state levels and entrenched land uses decrease the sustainability of the FSM communities in the face of changing climate conditions. Challenges include: (i) vulnerability to natural hazards and difficulty recovering from natural hazards; (ii) culture as traditional practice is replaced by imported resources; (iii) increased vulnerability to global warming; (iv) growing pressures on national and state resources; (v) problem solving by crisis management.⁽ⁱⁱ⁾; and (vi) availability of internet communications technology that varies across FSM, thus affecting educational outreach options for climate change and disaster management

Traditional land use and tenure, unstable slopes among the high islands, complexities in groundwater availability, alternative plans for using watershed lands by owners and various groups, low motivation and appreciation of climate risk, data gaps, and lack of adequate financing all signal that managing climate risk will be challenging. The situation could lead to displaced communities lacking real economic underpinning and low social standing. Moving and upgrading basic infrastructure will be expensive. There is little public land, and landownership is a complex and traditional foundation of political power in the FSM.

Considerable effort has been put into undertaking vulnerability and adaptation assessments, at a variety of spatial scales and for various sectors, with a focus on food security as a priority theme. However, there is still not a comprehensive understanding of vulnerability to climate change at National, State, island or community levels, assessments are not being informed by the results of systematic analyses of current or future risks, and identification of appropriate adaptation measures remains at a very generic level. The FSM has yet to develop the full range of sector level policies and strategies that will ensure climate change

considerations are reflected a meaningful way in all its development and social economic plans and activities.

Of particular note are capacity constraints. There are generally a limited number of highly skilled personnel, in permanent positions, to take on the task of managing climate change risks over the near and long term. Short term personnel and project personnel only go some way to addressing this gap, Climate change education at primary, secondary and tertiary levels, short term training, on-the-job training and job attachments are critical to address the capacity gap. So too is the need to develop innovative ways to retain skilled personnel in country through appropriate levels of remuneration and other means.

Raising public awareness about climate change risks is another important activity that needs to be implemented through a planned process thereby moving away from ad hoc approaches.

Given that many of climate change activities implemented in the FSM are project based, with 3-5 year time frames, the results and outcomes may not always be sustainable or replicated in other states. The FSM is already making efforts or/considering ways to prepare a financing strategy for disaster risk management and climate change activities and to tailor new projects to address specific gaps in their national agenda, and this approach needs to be maintained and expanded. There is a need to work with lending institutions such as the FSM Development Bank, the Rural Development, and the Pacific Islands Development Bank, as well as commercial banks, to encourage them to give more consideration to climate change when providing loans for building and other development initiatives. Incentives, such as offering lower interest rates for loans through which climate risks are addressed, are one initiative that banks might consider. Development partners should also be encouraged to ensure that climate-related risks and opportunities are given due consideration.

Integration of climate change into national, sector and community programmes, projects and activities is needed on a continual basis over the long term and there is a need to create an enabling environment for engaging with both local communities and national level government.

Another key challenge for the FSM is to ensure that gender-sensitivity and disability inclusiveness is addressed in its climate change programmes, projects and activities. Climate change affects communities and individuals in different ways and it is important to ensure that climate change activities are fully inclusive of these special groups.

The Second National Communications to the UNFCCC suggests that successfully achieving climate adaptation within the FSM may be facilitated by four initiatives: (i) establishing FSM as a National Implementing Entity in order to improve access to international funding, thereby increasing the flow of financial resources to the FSM and its States; (ii) forming international partnerships to aid adaptation efforts; and (iii) continuing the development of internal policies and legislation focused on building resilient and sustainable communities, including ensuring that development efforts do not make FSM more at risk to climate change and making a developer liable for actions that reduce the resilience of a community and/or island.

Annex 1 State Profiles

KOSRAE STATE^(i,ii)

The island of Kosrae is the easternmost island in FSM. Kosrae has an area of 112 km². It is a volcanic island surrounded by mangroves and coastal strand forests that have been

historically used for lumber and fuel by residents. There is a shallow fringing reef spotted with boulders of limestone eroded from the fore-reef by high-energy wave events. There are no outer islands. The island has steep, heavily vegetated watersheds with unstable slopes. Intense rainfall denudes exposed soil in areas of deforestation. Invasive vegetation is prolific and has taken a foothold in every watershed. The population of approximately 8,247 is largely dependent upon fishing and farming for their livelihood.

Kosrae has unique needs with regard to climate risk management and adaptation. The majority of the coastline is experiencing chronic erosion, in places related to engineering projects that have caused down-drift sediment deficiencies over the past four decades. Additional causes of erosion include offshore mining of the reef flat for construction materials, beach mining for sand and gravel resources. In some areas erosion is occurring for reasons that are not entirely known. The widespread coastal armouring has contributed to beach loss in front of seawalls and revetments. In addition, 75% of the housing and infrastructure is located in the coastal zone and is at risk of storm surges. The maximum over-wash elevation, plus 1m represents a base flood elevation for new construction and for renovation of existing buildings.

POHNPEI STATE ^(i,ii)

Pohnpei is a high volcanic island, having a rugged, mountainous interior with some peaks as high as 760m. It measures about 130km in circumference and is roughly circular in shape. Pohnpei Island is the largest, highest, most populated, and most developed island in FSM. A coral reef surrounds the island, forming a protected lagoon. There are no beaches on Pohnpei and the coast is surrounded by mangrove swamps. Several smaller islets, many of them inhabited, lie nearby within the lagoon-reef complex.

The population of Pohnpei is approximately 34,840. Pohnpei is more ethnically diverse than any other island in the FSM. This is largely due to it being home to the capitol of the national government, which employs hundreds of people from the other FSM States having distinct ethnic and cultural origins. The indigenous makeup also includes people from the outer islands within the State, which comprise multiple regional ethnicities. Outer islands in Pohnpei include Pingelap, Mokil, Ant, Pakin, Ngatik, Nukuoro, and Kapingamarangi. These are atoll islets that were severely impacted during the marine inundation events of 2007 and 2008.

Pohnpei's climate is tropical and humid. Kolonia town receives about 4.95m of rain annually. Typhoons rarely hit Pohnpei; more often they are spawned in Micronesia and move on to Guam and the Commonwealth of the Northern Marianas Islands. Every several years or so (on average), a mildly damaging tropical storm or depression will affect Pohnpei. Strong El Niño events can cause prolonged droughts lasting weeks or months, as was seen in 1997-1998. Torrential rainstorms can also strike Pohnpei. These rainstorms have caused serious landslides and mud slides in the past and represent a natural hazard. The tidal surges of 2007 and 2008 caused significant damage to coastal infrastructure in low-lying areas.^(i,ii)

There is a need for a specific plan to manage coastal problems.

CHUUK STATE ^(i,ii)

Chuuk Lagoon is one of the largest semi-closed circular oceanic atoll lagoons in the world, sitting high upon a Pacific Ocean seamount in Micronesia, western Pacific (Latitude 7.68°N - 7.38°N, Longitude 151.76°E -151.8°E). The 225 km-long protective barrier reef, roughly triangular in outline, encloses a natural harbour. The total area of the lagoon is 2131.5 km² with the total land area of about 99 km².

The two major geographical divisions of Chuuk Lagoon are Faichuuk, the western islands, and Namoneas, the eastern islands. Most of the roads and transportation systems are poor or in disrepair. Potholes in the coastal road of the business district of Chuuk are often filled with either saltwater at high tide or runoff that cannot drain due to the low elevation. Drinking water is un-potable. Chuuk State, population 53,106, also includes several additional sparsely populated outer island groups, including the Mortlock Islands to the southeast, the Hall Islands (Pafeng) to the north, Namonuito Atoll to the northwest, and the Pattiw Region to west. The Pattiw Region is of particular interest in that it contains some of the most traditional islands in the Pacific which are culturally related to the outer islands of Yap.

On July 2, 2002, heavy rains from Tropical Storm Chataan caused more than 30 landslides that killed 47 people and injured dozens of others in the state's deadliest weather disaster. The landslides occurred throughout the day, some within just minutes of one another.

The tidal surges of 2007 and 2008 caused significant damage to coastal infrastructure, food resources, and housing.

Investment has been identified to refurbish the main road. Unfortunately, with current knowledge of projected climate change, some design elements of these large infrastructure projects are out of date. Adding to the elevation of the main road in Chuuk would likely permit avoidance of significant drainage problems related to sea-level rise for a period of years to decades.

YAP STATE

Yap consists of four islands with geology that is non-volcanic in origin. The four are very close together and joined within a common coral reef and entirely formed from uplift of the Philippine Plate. The land is mostly rolling hills densely covered with vegetation. Mangrove swamps line much of the shore although beaches are common in some areas. An outer barrier reef and lagoon surrounds the islands and their fringing reef. Colonia is the capital of Yap State. It administers both Yap proper and 14 atolls reaching to the east and south for some 800km, namely Eauripik, Elato, Fais, Faraulep, Gaferut, Ifalik, Lamotrek, Ngulu, Olimarao, Piagailoe (West Fayu), Pikelot, Sorol, Ulithi, and Woleai atolls, as well as the island of Satawa. The 2009 state-wide population was 11,780. The state has a total land area of 102 km².

The tidal surges of 2007 and 2008 caused significant damage to coastal infrastructure, food resources, and housing. Yap is well developed and has a generally high quality of life. Nonetheless, water on the main islands is non-potable and this is a major issue that has not been resolved despite several decades of effort.

The central business district of Yap is built around a harbour, the shoreline of which is armoured by walls and revetments. However, the top elevation of most of this coastal protection is only 0.3 -0.6 m above high tide. By mid-century or earlier, this coastal protection will need upgrading to protect the critical roads, fuel depots, buildings, and freight handling facilities lining the harbour.

Over the next decade, climate risk management can focus on building a community-based adaptation program.

References

- ^{iq}<http://www.factfish.com/statistic-country/micronesia,%20federated%20states%20of/improved%20water%20source,%20total>. Retrieved from the Internet April 26, 2013
- ^{ib}http://www.indexmundi.com/federated_statesofmicronesia/sanitationfacilityaccess.html Retrieved from the Internet April 26, 2013
- Asian Development Bank. 2011. Technical Assistance to the Federated States of Micronesia Strengthening Infrastructure Planning and Implementation. R257-11 29 November 2011.
- Asian Development Bank. Country Operations Business Plan – Federated States of Micronesia 2012 – 2014. Asian Development Bank.
- Australian Bureau of Meteorology and CSIRO. 2011. Climate change in the Pacific: Scientific assessment and new research. Volume 1: Regional overview. Volume 2: Country Reports. Chapter (4): Federated States of Micronesia.
- FSM National Weather Service Office, Pacific Climate Change Science Program. 2011. Current and Future Climate of the Federated States of Micronesia.
- Food and Agriculture Organization. 2008. Climate change and food Security in Pacific Island countries. Rome: Food and Agriculture Organization of the United Nations.
- Federated States of Micronesia's Strategic Development Plan (2004 – 2023)-The Next 20 Years: Achieving Economic Growth and Self-Reliance. Vol 2: Strategic Planning Matrices and Appendices. (February 13, 2008).
- Federated States of Micronesia's Strategic Development Plan (2004 – 2023)-The Next 20 Years: Achieving Economic Growth and Self-Reliance. Vol 3: Infrastructure Development. (February 13, 2008).
- Hay, J. and UNISDR. Federated States of Micronesia – Descriptions of national institutions and policies: Climate change adaptation and disaster risk reduction institutional and policy landscape in Asia and Pacific. Draft report. 31, July 2010.
- Government of the FSM. 2009. Nationwide Climate Change Policy 2009. Pohnpei: Government of FSM.
- 1997 Climate Change National Communication. Federated States of Micronesia. (July 14, 2009).
- Pacific Climate Change Science Program. Australian Bureau of Meteorology and CSIRO, 2011. Climate Change in the Pacific: Scientific Assessment and New Research. Volume 1 Regional Overview, Volume 2 Country Reports.
- Raphael Lam, W. and Lee, J. 2011. 2011 International Monetary Fund – Federated States of Micronesia: Statistical Appendix. IMF Country Report No. 11/36.
- Secretariat of the Pacific Community. 2007. Federated States of Micronesia Country Profile. Secretariat of the Pacific Community. (February 15, 2008).
- Secretariat of the Pacific Community. Graphics/Image publications - Map, 2012.
- Secretariat of the Pacific Community. 2011. Pacific Island populations – estimates and projections of demographic indicators for selected years. Noumea, New Caledonia: SPC
- Secretariat of the Pacific Community. 2010. 2010 pocket statistical summary. Noumea, New Caledonia: SPC.
- Staff Representative for the 2010 Consultation with the Federated States of Micronesia. 2010. Federated States of Micronesia: 2010 Article IV Consultation – Staff Report, Public Information Notice and a Statement by the Executive Director of the Federated States of Micronesia on the Executive Board Discussion. IMF Country Report No. 11/43.
- Wortel, O. 2010. Federated States of Micronesia – Fourth national report: Implementation of Article 6 of the Convention on Biological Diversity. Fourth country report from the Federated States of Micronesia to the United Nations Convention on Biological Diversity. Pohnpei: Government of FSM.

ⁱ Secretariat of the Pacific Community. 2011. Pacific Island populations – estimates and projections of demographic indicators for selected years. Noumea, New Caledonia: SPC

ⁱⁱ The human development index (HDI) is a comparative measure of life expectancy, literacy, education, and standards of living for countries worldwide. It is a standard means of measuring well-being, especially child welfare. It is used to distinguish whether the country is a developed, a developing or an under-developed country, and also to measure the impact of economic policies on quality of life.