Federated States of Micronesia

Kosrae Joint State Action Plan for Disaster Risk Management and Climate Change

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FOREWORD

Kosrae is blessed with an abundance of natural resources, upon which our people's livelihoods are sustained. Our marine and terrestrial environments provide a rich source of food, water and materials. These environments provide economic benefits to our people and, along with Kosraen culture, draw visitors to our shores. Our social and cultural systems provide communities with a strong source of resilience that has traditionally sustained us through disaster events such as typhoons, storms and high sea and swell events.

Climate change, and the associated impacts including sea-level rise, increasing temperatures and changing rainfall patterns, poses a significant threat to our livelihoods in Kosrae. High sea and swell events, such as those experienced in recent years, as well as climate-related disease outbreaks such as dengue fever, provide a glimpse into what the future may hold as the impacts of climate change become manifest across all elements of the Kosraean society.

This Joint State Action Plan (JSAP) for Kosrae represents an important step towards addressing climate and disaster risks in a holistic and integrated manner. Aligning with our Strategic Development Plan and developed using a highly participatory and inclusive approach, this JSAP places Kosrae in good stead for a future that protects our people's livelihoods and environment. With specific actions identified for six key sectors, and with pre-identified leading and supporting agencies, this JSAP supplements Kosrae's SDP, and is a step towards risk-proofing our future.

I am pleased to support this JSAP as it highlights the importance of mainstreaming a climate and disaster risk reduction approach across all our sectors in Kosrae. By working together and with all stakeholders taking responsibility for reducing risk, the future of Kosrae and our next generations will be assured.

Sincere thanks and commendation is offered to all stakeholders involved in the development of the JSAP, including government and community representatives, as well as the support and guidance from Office of Environment and Emergency Management (OEEM) and SPC.

Lyndon H. Jackson

Governor

ACKNOWLEDGEMENTS

The Kosrae State leadership is indebted to the efforts of all those who contributed to the development of this State Joint Action Plan for Disaster Risk Management and Climate Change.

The active participation of the various segments of our community was encouraging and reaffirms the concerns they are now facing and the eagerness of enhancing their safety and resilience. The contributions made by the government representatives, mayors, church leaders, women groups, youth groups and persons with disabilities were valuable, ensuring that the plan is realistic and relevant.

The leadership displayed by the FSM's national Office of Environment and Emergency Management (OEEM) and the Secretariat of the Pacific Community (SPC) is commendable. Their professional input and guidance has been captivating and engaging, encouraging the full participation of the Kosraen stakeholders in developing the plan.

The funding support from the European Union through the EU ACP Building Safety and Resilience in the Pacific (BSRP) project being implemented by SPC is greatly appreciated without which the development of the plan would have been impossible.

SPC Secretariat of the Pacific Community

SPREP Secretariat of the Pacific Regional Environment Programme

IOM • OIM

EUROPEAN UNION

SPC Secretariat of the Pacific Community

Building Safety and Resilience in the Pacific Project

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ACRONYMS

ADB	Asian Development Bank
CCA	Climate change adaptation
CCCPIR	Coping with Climate Change in the Pacific Island Region
DCO	Disaster Coordination Office
DREA	Department of Resources and Economic Affairs
DRM	Disaster risk management
DRR	Disaster risk reduction
DT&I	Department of Transport and Infrastructure
ENSO	El Niño–Southern Oscillation
EOC	Emergency Operations Centre
FEMA	Federal Emergency Management Agency (US)
FSM	Federated States of Micronesia
HFA	Hyogo Framework for Action 2005 – 2015
HSD	Health Service Department
GDP	Gross domestic product
GEF/UNDP	Global Environment Facility of the United Nations Development Program
IOM	International Organization for Migration
JRMN	Joint Risk Management Network
JSAP	Joint State Action Plan
KCSO	Kosrae Conservation and Safety Organization
KIRMA	Kosrae Island Resource Management Authority
KUA	Kosrae Utility Authority
M&E	Monitoring and Evaluation
MRCS	Micronesia Red Cross Society
NDTF	National Disaster Task Force
NIWA	National Institute of Water and Atmospheric Research (NZ)
OEEM	Office of Environment and Emergency Management
PACC	Pacific Adaptation to Climate Change
PIFACC	Pacific Islands Framework for Action on Climate Change 2005 – 2015
PIFS	Pacific Islands Forum Secretariat
RFA	Pacific Disaster Risk Reduction and Disaster Management Regional Framework for Action 2005 – 2015
SDP	Strategic Development Plan
SOPAC	Applied Geoscience and Technology Division
SPC	Secretariat of the Pacific Community
SPREP	Secretariat of the Pacific Regional Environment Program

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COUNTRY AND STATE CONTEXT

1.1 GEOGRAPHY

Kosrae is the eastern-most island in FSM, and has an area of 112 km^2. It is a volcanic island surrounded by mangroves and coastal strand forests. The island has steep, heavily-vegetated watersheds with unstable slopes, rising to a 2064 ft peak (Mt Finkol). These uninhabitable slopes account for around 70% of Kosrae's total land area. Kosrae's forests have been historically used for lumber and fuel by residents; however, intense rainfall denudes exposed soil in areas of deforestation. Invasive vegetation is prolific and has taken a foothold in every watershed.

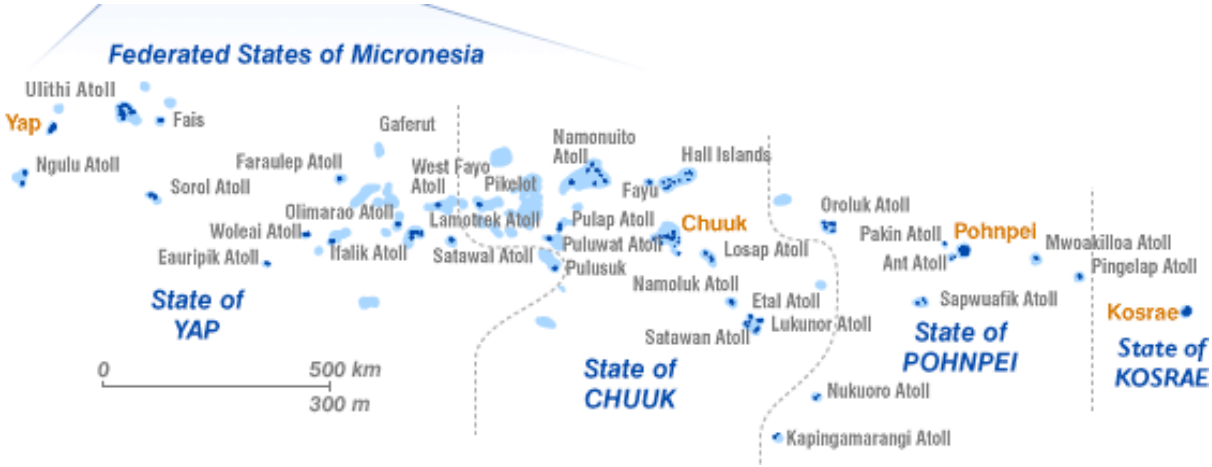


Figure 1: Map of the Federated States of Micronesia.

The island is surrounded by a shallow fringing reef. Seventy-five percent (75%) of Kosrae's housing and infrastructure is located in the coastal zone, and is at risk of damage due to storm surges. Kosrae has around 10.3 km^2 of land suitable for agriculture and around 64.5 km^2 of forested land.

In FSM, there is little seasonal variation in temperature, with less than 1.5 ºC 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. Kosrae is considered one of FSM's wet islands, receiving over 300 inches of rainfall a year.

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.

The state of Kosrae is divided geographically and administratively, into four municipalities: Lelu, Malem, Tafunsak and Utwe (see Figure 1) and land is both privately and State owned, while aquatic areas are managed by the State as public trusts.

1.2 POPULATION AND CULTURE

> *"The legend says that at the beginning of time the powerful gods planned to create this mountainous island in the shape of a man. Later they thought that if they made it into the shape of a man it would not produce seeds known as people. So they created the mountains in the shape of a sleeping woman instead. The island of the sleeping lady was borne."*

The total population of the FSM is approximately 102,843 persons. Kosrae has the smallest population of any of the FSM states, at 6,616 (2010 Census).

Figure 2: Map of Kosrae with the four municipalities defined.
Source: http://web.mit.edu/12.000/www/m2009/finalwebsite/during_evacuation.html

The population of FSM is predominantly Micronesian but there are some Polynesian enclaves, primarily in the Pohnpei State. English is the official language of FSM; however, eight indigenous languages are spoken in the FSM, including Kosraean, which predominates in the State of Kosrae. Kosraean traditional culture was highly influenced by the missions in the mid-19th century, and religious activities continue to influence much of the lives of Kosraeans.

Each of the FSM states, being separated by large expanses of water, has maintained their own distinct culture, traditions, customs and languages. However, some centuries-old economic and cultural bonds between the states exist.

1.3 ECONOMY

In 2009, FSM's GDP was US$274 million. Annual growth was at -3.2% while inflation was at 2.8%. Around 70% of households across FSM have an annual income below US$15,000, and the unemployment rate across FSM is at 22 %. The incidence of families with incomes below the poverty line in FSM is among the highest in the Pacific region, as is inequality of income.

FSM runs a large trade deficit, with imports being around ten times larger than exports. Food and fuel represent a significant proportion of this – comprising 46.6% of total imports to FSM in 2007. FSM is highly, and increasingly, dependent on these food imports, and total food imports showed a steep increase from US$17 million to US$43.6 million in the nine years to 2009 (FSM Agriculture Policy). Rising global food and oil prices means the costs of imports will continue to rise, and will have serious implications for FSM's terms of trade.

Subsistence farming and fishing are key elements of the Micronesian economy. Unlike other parts of the Pacific, tourism income is limited due to a lack of access and facilities. A small number of hotels have opened in Kosrae, somewhat increasing tourism income; however, these opportunities remain limited due to inadequate air transport infrastructure.

The vast majority or FSM's exports are tuna fish, as FSM has one of the largest tuna fisheries in the Pacific. Agricultural exports from FSM include betel nuts and kava. Kosrae exports citrus, banana and root crops; however, these are very small. According to the 2012 Agriculture Policy, an opportunity exists to diversify the agricultural base into high-value-added activities.

National and state level governments in FSM employ over half of the country's workers. Government services and public enterprises account for 38% of GDP.

The FSM public sector is highly dependent upon development funding. US aid and compact funding provides about 65% of revenue for national government and 75% of revenues for the states.

Kosrae's gross domestic product (GDP) in 2007 was around $15.9 million, making its contribution to national GDP around 8%. While the population of Kosrae is partially dependent upon fishing and farming for their livelihoods, non-farm activities contribute significantly to income (see Table 1 below). The reopening of a fish processing and cold storage plant in Kosrae contributed to a reported 4% national economic growth rate in 2010.

Table 1: Main sources of income and livelihood opportunities of respondents in Kosrae.

	Percentage of households	N=	Percentage of income
Non-farm activities	68	247	59.1
Remittances (money and goods)	64	234	21
Other sources	23	85	9.2
Crop cultivation	71	256	3.1
Tree crops	74	269	2.5
Fishing	70	252	2.1
Livestock	71	256	1.6
Farm labour	4	15	1.6

Source: Monnereau and Abraham (2013).

1.4 GOVERNANCE

FSM was administered by Spain, Germany, Japan and the USA before establishing a constitution and achieving independence in 1986. It then joined the United Nations in 1991.The FSM is a constitutional democracy in free association with the United States (US). The FSM entered into a Compact of Free Association with the US with the first funding period being 1986-2003 (worth US$1 billion), and the second being 2004-2023 (worth US$1.8 billion).

The FSM has three levels of government: national, state, and municipal. The national parliament is comprised of 14 representatives from the states, and the President is elected from within this parliament. The national government exercised only certain powers expressly delegated to it by the constitution.

The four state governments of Chuuk, Pohnpei, Yap and Kosrae are relatively autonomous. A Governor is elected to head each of the four states. The state government of Kosrae is the smallest in FSM. The Governor heads the Executive branch of the government, with cabinet members heading the government departments and offices.

Legislation is often a shared responsibility between the state and national levels, which at times leads to duplication and other time gaps where lines of responsibility are unclear. A "Joint Opinion" regarding state and national jurisdiction over certain environmental issues was developed by state and national Attorneys General and while not signed notes states remain responsible for environmental issues such as;

- ecosystem protection (such as reefs and mangrove swamps);
- land use, land management; and
- agriculture, forestry and watershed protection.

Regulatory authority is transferred to the national government in instances where issues have a visible effect on foreign or interstate commerce or concerns public health.

The states have devised their own strategies for development, while an integrated perspective for the federation is provided by the national government.

1.5 RISK AND RESILIENCE CONTEXT

1.5.1 Natural vulnerability and resilience

Natural variability contributing to vulnerability in Kosrae includes:

- Natural climate variability resulting in shoreline repositioning.
- El Niño Southern Oscillation (ENSO) events affecting rainfall and sea levels (2-5 year cycles).

- Decadal/Inter-decal Pacific Oscillation (20-30 year cycles).
- Typhoon activity.

Kosrae also has considerable natural resilience through its natural resources and defence systems. For example, mangroves provide a level of natural resilience through direct coastal protection to around 22% of Kosrae's coastline. Reef flat mangroves, harbour mangroves and lagoon mangroves each provide various degrees of coastal protection depending on their location and context.

As noted in the Kosrae State Biodiversity Strategy (2004), biodiversity should be seen as the foundation of the island's long-term economic self-sufficiency. For example, of over 335 species of fish are found within Kosrae's waters, 250 are considered as food. A vegetation survey indicated a presence of over 100 plant species; with 45 of these being food crops including fruits, vegetables, aroids and tubers.

1.5.2 Human-induced vulnerability and resilience

Development impacts

Development practices, such as building in hazardous areas, can enhance levels of vulnerability and even worsen the impacts of coastal hazards. In Kosrae, where much of the critical infrastructure is located close to the coast, key human-induced drivers of vulnerability include:

- Sand and coral rubble removal from the reef flat (particularly along Kosrae's east coast between Finaunpes and Mosral).
- Beach mining (removal of sand, gravel and cobbles) from the beach, primarily for construction aggregates.
- Dredging of the reef flat in front of Tafunsak village.
- Stream outlet repositioning, or changing swamp drainage patterns and flows.
- Inappropriate building of seawalls, exacerbating erosion elsewhere or resulted in further development in high risk areas.
- Land reclamation in areas already prone to flooding.
- Shoreline protection solutions which disregard coastal hazard risk reduction.
- Road development across wetland/mangrove areas and reclaimed land (Ramsay et al., 2013).

Climate change has the potential to enhance these hazards in Kosrae. See Section 2.2 for climate change impacts on key sectors in Kosrae. Table 2 provides an overview of the key natural and human-induced hazards for Kosrae.

Table 2: Kosrae's natural and human-induced hazards.

Key natural hazards	Key human-induced hazards
Higher-than-normal high tides (occur every year usually between December and February and associated with strong phases of La Nina)	Fire
Large sea swells (caused by North Pacific storms, occur once in a generation)	Contamination of water supply
Tropical storms and typhoons (occur once in a lifetime and usually affect the eastern southern and northern coastlines)	Outbreak of epidemic diseases
Drought	Commercial transport accidents
Rain-induced landslide (primary forest is still intact which decreases the risk of landslides)	Dam failure (no recorded events amongst Kosrae's 12 water tanks/catchments)
Earthquake (no reported events)	Hazardous materials accident
Tsunami (no recorded disaster events)	

Inundation from high tides is of particular concern in the following areas:

- Lelu Island (reclaimed areas and canal sections).
- Pukusruk (reclaimed land, landward of the road).
- Utwe village (reclaimed land).
- Walung (section of coast between Insiaf and Pilyuul).
- Tafunsak (communities at Malsu, Yekula, Finfukul and Sialat).

Kosrae is rarely affected by cyclone events, with the last major cyclone being in 1905. When they do occur, cyclones usually track to the north and west of the island. Given the high exposure of the vast majority of Kosrae's infrastructure (roads, utilities, properties, public buildings), should a typhoon hit Kosrae, it would cause significant damage, as existing coastal defences would do little to shelter land or property.

Socio-cultural resilience in Micronesia

Micronesians demonstrate significant socio-cultural resilience and resourcefulness through their culture and their understanding of the environment upon which they have traditionally been dependent. Kinship and exchange networks between islands of varying vulnerability enable communities to deal with extreme events and natural disasters. In the past, mechanisms such as travel, migration and formal ceremonial exchange systems served communities well in dealing with extreme events. Today, the heritage practice of keeping 'exchange paths' active through kinship relations can be seen as a source of resilience and a strategy to cope with climate change (see Henry and Williams, 2008).

Another traditional source of resilience in Micronesia is through food preservation for offsetting seasonal variations in food availability, to provide nourishment in times of disasters when crops are likely to be destroyed or damaged. As noted by Campbell (2006), such methods in Micronesia include:

- Fermentation of breadfruit in pits.
- Creating pandanus and arrowroot flour.
- Leaving yams in the ground.

1.5.3 Recent damaging events

Recent disaster events are provided in Table 3, which shows flooding from distant storms and high tides and typhoons contributing to the damaging events over the last century.

Table 3: Recent known damaging events affecting Kosrae.

Damaging event	Known impacts
Large swells from distant storms	
October 13 and 14, 1961	Large waves inundated parts of Walung, causing damage to property at Insiaf and Leap. The waves caused a coconut tree to fall resulting in the deaths of two small children
December, 1969	Affected the north coast of Kosrae
November, 1979	A swell wave event damaged the old school buildings in Walung
8 and 9 of December, 2008	Flooding affecting northern coastline (Tafunsak, Walung and parts of the Lelu coastline)
January 2013	Affected east coast of Kosrae from Paal to Mosral in Malem
December 20, 2013	Affected northern part of Walung
High tides combined with La Niña	
December, 1999 to January, 2000	Higher sea levels and inundation
November, 2007 to February, 2008	Higher sea levels and inundation
Typhoons	
1835 or 1837	No details of impacts available
15 March, 1874	Severe storm or typhoon from the south sinks Bully Hayes ship
3-4 March, 1891	Typhoon from the south. All but six houses left standing and virtually all breadfruit and coconut trees destroyed. This typhoon deposited a bank of coral rubble on to the reef flat along much of the eastern coastline which acted as a breakwater, sheltering the environment of wave energy and leading to the growth of mangroves around streams on the east coast.
1900?	Typhoon
19-23 April, 1905	Most recent severe typhoon, lasting seven hours with much destruction of property and trees
19 May, 1986	Typhoon Lola passed to the north west of Kosrae
5 January, 1972	Typhoon Axel passed 75 km north of Kosrae. Maximum sustained winds of up to 80 knots were recorded resulting in severe crop losses, trees and vegetation damaged, and some wooden and tin-roofed structures destroyed.
17 December, 2001	Tropical Storm 31W (Faxia) tracked west of Kosrae causing over washing on the east coast

Damaging event	Known impacts
Drought	
1997/1998	Associated with the El Nino event, this event affected all of the FSM including Kosrae (considered one of the "wet" states)
Flood	
7 April 2014	Inundate 218 houses in Tafunsak and 4 houses KCSO office in Tofol
23 July 2014	Inundate houses in Utwe
Landslide	
23 July 2014	Landslide at Utwe missing houses hence not causing significant damages

Source: DCO (2014), Ramsay et al. (2013); URS (2005).

1.6 SECTOR AND POLICY CONTEXT

1.6.1 National policy context

Key national policies of relevance to disaster risk management and climate change are found in Table 4, with key policy goals and/or priority actions highlighted.

Table 4: FSM's national policies and key goals/priority actions.

National sector policy for FSM	Key policy goals/Priority actions	
National Strategic Development Plan (2004-2023)	The National Strategic Development Plan has four main objectives: • 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. • 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. • Improved education and health status – use of the annual Compact grant to support the provision of basic services in education and health. • 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.	
Nation Wide Integrated Disaster Risk Management and Climate Change Policy (2013)	Strategic outcomes: • Economic resilience • Food, water and energy security • Infrastructure and settlements • Waste Management and Sanitation • Health and Social Protection • Education	Strategic Objectives: • Capacity Building and Public Awareness • Disaster Risk Management • Climate Change Adaptation • Greenhouse Gas Emissions Reduction • Enabling Environment
Agriculture Policy (2012)	• Achieve national food security, safety and nutritional health. • Improve farm incomes and livelihoods with particular focus on gender and vulnerable groups. • Strengthen socio-cultural safety nets. • Preserve and protect culture, traditional knowledge and practices. • Support sustainable economic growth and improve the balance of trade. • Improve natural resource management.	
Energy Policy (2012) and State Energy Action Plans	Vision: To promote the sustainable social and economic development of FSM through the provision and utilization of cost-effective, safe, reliable and sustainable energy services. Goals: • An effective, coordinated, resilient and dynamic joint states and national energy sector. • A safe, reliable, cost-effective and sustainable energy supply. • An efficient, attentive, responsive and competitive energy sector. • A diversified energy resource base. • The environmentally sound and efficient use of energy.	

National sector policy for FSM	Key policy goals/Priority actions
Framework National Water And Sanitation Policy (2011)	Vision: To ensure that the people of the Federated States of Micronesia's right to secure access to safe and clean drinking water is met, and that the use of the nation's freshwater resources is planned in a manner that maximises the benefits of this scarce and fragile resource for island communities, now and in the future. Goals: • To create an environment at the national level, in which collaboration and partnership in addressing water resource and wastewater management issues, between all stakeholders, and at all levels is fostered and encouraged. • To enhance the mainstreaming of Integrated Water Resource Management and Water Use Efficiency Principles into National and State Development Planning.
Infrastructure Development Plan FY2004-FY2023 (2004)	• Electric Power: ensure that all areas of the country are provided with electric power in an efficient and effective manner. • Water/Wastewater: Meet the demand for water supply and wastewater infrastructure in an effective and efficient manner. • Solid Waste Management: Meet the demand for solid waste infrastructure in an effective and efficient manner. • Roads and Pedestrian Facilities: To provide the infrastructure to enable transportation facilities to be adequate in terms of condition, capacity, reliability and safety to enable market opportunities to be realised for all areas of the country, including labour market opportunities. • Maritime Transportation: To provide the facilities necessary to enable market opportunities to be realised for all areas of the country, including labour market opportunities. • Education: To ensure that the learning experience is enhanced and diversified. • Health: To construct modern and efficient hospital facilities to meet the health needs of the nation. • Government Administrative Buildings: To construct modern and efficient facilities required for government personnel to effectively undertake their functions.
National (and States) Biodiversity Strategy and Action Plan (2002)	Eleven strategic themes, each with strategy goals: • Ecosystem Management • Species Management • Genetic Resource Use • Agro biodiversity • Ecological Sustainable Industry Development • Biosecurity • Waste Management • Human Resources & Institutional Development • Resource Owners • Mainstreaming Biodiversity • Financial Resources
Information, Communication & Technology Policy (2012)	Vision: Secure, efficient and affordable ICT to achieve equitable communication for the people of FSM. Goals: • Achieve accessible and affordable communications for all. • Strengthen ICT human resources and increase human resource development opportunities through ICT. • Improve economic growth and sustainable development through ICT. • Utilize ICT for good governance. • Create an enabling ICT environment through policy reform and improvements in legal frameworks.
Multi-State Multi-Hazard Mitigation Plan (2005)	National goals: • Promote disaster resistant existing and future development. • Increase public understanding and support for effective hazard mitigation. • Build and support local capacity and commitment to become less vulnerable to hazards. • Improve hazard mitigation coordination and communication with federal, state, and local governments. • Reduce the possibility of damage and losses to existing assets, including people, critical facilities/infrastructure, and public facilities due to all identified hazards.

National sector policy for FSM	Key policy goals/Priority actions
Five Year Environment Sector Plan (2008)	Strategic goals: • Mainstream environmental considerations, including climate change, into national policy and planning as well as in all economic development activities. • Improve/enhance human environment and pollution control. • Reduce energy use and convert to renewable energy sources/minimise emissions of greenhouse gases (GHG). • Enhance the benefits of sustainable use of the FSM's genetic resources and ensure benefits are fairly shared amongst stakeholders. • Manage and protect the nation's natural environmental; protect, conserve and sustainably manage a full and functional representation of the FSM's marine, freshwater and terrestrial ecosystems. • Improve environmental awareness and education and increase involvement in citizenry of FSM in conserving natural resources. • Establish biosecurity (border control, quarantine) programs to effectively protect FSM's biodiversity from impacts of alien species. • Create sustainable financial mechanisms for environmental and sustainable resource initiatives. • Enhance and employ in-country technical capacity to support environmental programs.
National Climate Change and Health Action Plan (2012)	Key recommendations include: • Review, discuss and consider implementation of the adaptation strategies. • Emphasise importance of community engagement and involvement with Adaptation activities. • Initial focus should be on diseases considered to be "high risk" with respect to climate change in FSM (vector-borne and water-borne illnesses and malnutrition/food security). • The FSM EpiNET team should mainstream climate change and health issues into their program activities, with the Environmental Health Coordinator acting as the key contact for climate change and health, with input from representatives from OEEM, Resource and Development (R&D), Weather Service Office (WSO) and other national agencies and Offices as needed. See National Climate Change and Health Action Plan for the Federated States of Micronesia for details.

1.6.2 State sector policy context

Table 5 has specific policies and plans for Kosrae state.

Table 5: Kosrae state's sector policies and key goals/priority actions.

State sector policy for Kosrae	Key policy goals/Priority actions
Kosrae State Hazard Mitigation Plan (2005)	1. Promote disaster-resistant existing and future development. 2. Increase public understanding and support for effective hazard mitigation. 3. Build and support local capacity and commitment to become less vulnerable to hazards. 4. Improve hazard mitigation coordination and communication with FSM federal, state and local governments. 5. Reduce the possibility of damage and losses to existing assets, including people, critical facilities/infrastructure, and public facilities due to coastal erosion/rising sea level/storm surge/ tsunami. 6. Reduce the possibility of damage and losses to existing assets, including people, critical facilities/infrastructure, and public facilities due to flood. 7. Rain-induced landslides. 8. Typhoon. 9. Drought/extreme heat. 10. Wildfire/structure fire. 11. Reduce the possibility of an epidemic. 12. Other hazards (including earthquake, dam failure, hazardous materials, and terrorism).

Kosrae Shoreline Management Plan (2013)	Eight key strategies: 1. Continued development and strengthening of community awareness (focus on effective natural coastal defence and Kosrae-relevant climate change impacts and adaptation options). 2. Amendment of the Kosrae Island Resource Management Authority (KIRMA) regulations for development projects to incorporate climate change considerations. 3. Develop primary coastal road network and associated infrastructure inland over next one/two generations. 4. Ensure new development is located away from areas at risk. 5. Implement a program to encourage existing residential property owners to reposition homes away from areas of high risk. 6. Housing loan program to include grants to encourage new property to be constructed in areas of lower risk. 7. Commence community and state discussions to develop a relocation strategy and identify potential approaches to support relocation. 8. Adopt a strategic approach for the ongoing provision of coastal defences.
Kosrae State Land Use Plan (2003)	• To assist with the orderly physical development of the resources of Kosrae. • To protect ecologically important or unique natural resources and habitat areas. • To assist with the review and permitting of development projects. • To assist with the planning of Government activities and use of government resources. • To provide guidelines for the sustainable use of natural resources.
Kosrae State Biodiversity Strategy and Action Plan (2004)	Vision: The State of Kosrae will have a more extensive, diverse, and higher quality of marine, freshwater, and terrestrial ecosystems, which meet human needs and aspirations fairly, preserve and utilize traditional knowledge and practices, and fulfill the ecosystem functions necessary for all life on Earth. Goals: • To develop, review, and enforce policies and regulations for sustainable harvesting of natural resources. • To create and implement educational and awareness programs in the community that address biodiversity conservation. • To improve, manage and preserve vital ecosystems. • To minimize waste contributing to the pollution of our environment. • To implement programs and practices for the security of our genetic resources and local knowledge. • To develop programs for restoring biodiversity and species habitat.
Kosrae's Strategic Development Plan (2014 – 2023)	Targets exist for five sectors below, with overall goal being to achieve economic advancement and budgetary self-reliance. Key sectors: • Health • Education • Private Sector Development • Environment • Culture & Social

Kosrae is the only of FSM's four states to have a state land-use plan. The plan has 'Areas of Special Concern' highlighted, with a number of management strategies proposed to cover forests (mangroves, freshwater wetlands, upland, and watershed components); the shoreline and reef (ocean waters and Trochus sanctuary components); waste management; the Utwe-Walung Marine Park; and cultural and historic site reservation.

1.6.3 Disaster and climate change policy context

FSM's 2005 Multi-State, Multi-Hazard Mitigation Plan includes details of Kosrae's critical hazard related exposure to specific hazard types. See Appendix A for details. The Plan also identifies the following hazards as priorities for addressing:

- Coastal erosion/rising sea level/large storm swells;
- Floods;
- Rain-induced landslides;

- Typhoons;
- Drought/extreme heat;
- Wildfires/structure fires; and
- Epidemics.

FSM's Multi-State, Multi-Hazard Mitigation Plan includes specific goals and actions for Kosrae, with the top ten actions being prioritised. Progress and actions could be reviewed and again prioritised given nine years have passed since their development.

In addition, laws and regulations relevant to disaster risk management and climate change include:

- the Disaster Relief Assistance Act of 1989 (outlining powers and responsibilities of both the national and state levels of government – see Appendix B for details).
- the Disaster Mitigation Act of 2000.

In 2008, USAID assumed responsibility for disaster assistance (response and reconstruction) to FSM (along with the Republic of the Marshall Islands) from the US Federal Emergency Management Agency (FEMA). This change aims to reflect the transition of FSM to an independent country.

A Nationwide Climate Change Policy was adopted by FSM in 2009, and overseen by the Office of Environment and Emergency Management (OEEM). The focus is to mitigate climate change, particularly at the international level, and adaptation at the national, state and community levels to reduce vulnerability of the FSM to climate change impacts. In 2013, a Nationwide Integrated Disaster Risk Management and Climate Change Policy was put in place which, amongst other things, focuses on adaptation at the national, state and community levels to reduce vulnerability of the FSM to climate change and disaster risks.

Governance of disaster risk management and climate change is delivered through the FSM Climate Change Country Team and the FSM National Disaster Task Force (NDTF). These structures are complemented by the divisions of Emergency Management and Environment and Sustainable Development in the OEEM.

The FSM NDTF is made up of Secretaries of the Departments, and Directors of offices and agencies that comprise Cabinet. This committee serves as an advisory body to the President on policy matters pertaining to the dispensing of the National Government disaster assistance to the state(s) stricken by disaster. The NDTF is responsible for guiding and supporting the development and implementation of disaster management programmes. A disaster risk management (DRM) 'network' exists amongst the Government of FSM and its main disaster risk reduction (DRR) partners.

Each FSM state has its own set of environmental laws and regulations geared to protect the islands from the effects of climate change. The Governor of each state has primary responsibility for the formulation of policies and procedures to deal with natural disasters and mitigation activities within their state. The Governor's Disaster Committee for each state includes all department, office and agency heads. The Committee serves as an advisory body to the Governor in the formulation of policies and coordination of the disaster response efforts.

1.6.4 Key sectors – background context

Water resources and sanitation

Rainfall in Kosrae, as for all the states of FSM, usually occurs in short, heavy downpours. Rainfall is collected in water tanks/catchments across Kosrae as a primary source of water for drinking, cooking and daily living. Around three-quarters of Kosrae households use water catchment tanks or drums as their primary water source for drinking and cooking. Around 99% use the public water system for non-potable uses such as laundry, washing, crops and animal feeding since the public water system is not fit for drinking purposes. Threats to Kosrae's water resources include climate change, deforestation of the watersheds and sanitary controls on the watershed activities through both human and animal interferences.

Most households (93%, reported in 2005) have flushed toilets and private septic tanks, with draining services available. Lelu is the only municipality maintaining a public sewer system, with raw sewage from each household or commercial unit being treated through a primary treatment process. Once the primary tanks are full, homeowners will pay $100 to the Department of Transport & Infrastructure to drain the septic tanks and transport the sewage to the oxidation pond.

Agriculture

Agricultural exports from Kosrae are very small in comparison to other states of FSM and consist mainly of citrus, bananas and root crops. Reliance on imported food is high in FSM and particularly so in Kosrae, which has a lower level of subsistence livelihoods (approx. 8.5%) compared to other states (up to 30% in Yap).

Human health

Kosrae's health system is provided by the public sector, with only one hospital. Given the limited extent of specialist services, a referral system to hospitals in Hawai'i, Guam and the Philippines exists for Kosrae.

FSM health-care spending per capita is relatively high when compared to the Pacific region as a whole, with Cook Islands and Marshall Islands being the only countries with rates higher.

Non-communicable diseases have been increasing over the past two decades in FSM; however as a whole, the people of FSM have a relatively high level of health care.

Vaccine-preventable diseases have declined over time in FSM; however outbreaks of the zika virus, dengue fever, Hepatitis A and multidrug-resistant tuberculosis have been observed, while leprosy is also prevalent in the population. The World Health Organization has noted that a strategic plan is needed to continue improving health services, public health surveillance and information systems.

Infrastructure

Since the World War II, development in Kosrae has predominantly occurred on the coastal fringe with property and infrastructure built in flat and low-lying coastal areas prone to flooding. Most households are built with iron sheets for roofs and cement and wood for walls. Sea-level rise and associated coastal impacts such as shoreline erosion and inundation threatens infrastructure of coastal areas of Kosrae where much of the critical infrastructure is located.

The 2005 Multi-State, Multi-Hazard Mitigation Plan for FSM notes the absence of building codes, zoning ordinance and other special purpose ordinances (e.g. floodplain management, storm water management, hillside or steep slope ordinances, wildfire ordinances, hazard setback requirements) at national and state level.

Kosrae's residential and commercial buildings risk and exposure is found in Table 6.

Table 6: Potential exposure of residential and commercial buildings in Kosrae.

2005 data		Residential buildings at risk		Commercial buildings at risk	
Municipality	Population	Building count	Potential exposure (x$1000)	Building count	Potential exposure (x$1000)
KOSRAE	7696	1087	6522	24	3600
Utwe	1067	156	936	1	150
Malem	1571	248	1488	3	450
Tafunsak	2457	326	1956	10	1500
Lelu	2591	357	2142	10	1500

(Source: URS, 2005)

Fisheries, coastal ecosystems and biodiversity

While there is sparse knowledge of FSM's biodiversity, it is understood that Kosrae has rich terrestrial and marine biodiversity, comprised of various terrestrial vegetation (cloud forests in cloud shrouded mountainous peaks; upland forest and agroforest, comprising 70% of Kosrae's vegetation, endemic swamp forests and mangroves). The endemic and only remaining stand of Terminalia carolinensis trees (locally known as Ka) is found in Kosrae. Introduced and invasive species are a continual threat to Kosrae's environment.

Native terrestrial mammals include fruit bats, while introduced species include rats, pigs, dogs and cats, as well as goats and cattle. Resident and migratory birds are also found in Kosrae and across FSM.

Marine and coral reef biodiversity is high across FSM; however, decreases from west to east (Government of the Federated States of Micronesia, 2002), with Kosrae recording lower diversity than the western states. State governments manage inshore marine resources including coral reefs and associated lagoonal and coastal ecosystems. Kosrae has one protected marine area – the Utwa-Walung Conservation Area on the north-west coast of Kosrae. FSM also has a National Biodiversity Strategy and Action Plan, with states responsible for its implementation.

Energy

As for other FSM States, Kosrae has its own state-owned power utility authority, which for Kosrae is the Kosrae Utility Authority (KUA). At the national level, the Division of Energy operates under the Department of Resources and

Development, with responsibility for promotion of energy efficiency and the development of renewable and indigenous sources of energy, and coordination with the state governments on sustainable use of fuel energy. In 2012, Congress adopted FSM's National Energy Policy (see Table 4 for key policy goals).

FSM is heavily reliant on imported petroleum for its energy needs, which comprise 86% of gross energy supply, with the remaining 14% supplied by biomass. As noted in a 2013 report on renewable energy opportunities, 8% of households rely on wood for cooking, the lowest of all of FSM's states. Kosrae has the highest rate of access to electricity in FSM, at 98% coverage.

FSM's vulnerability to external fluctuations in global prices of food and fuel is significant due to heavy reliance on imports. Global fuel prices are volatile, and there is a time of increased concern over existing energy reserves and the transition globally to focus more on renewable energy.

Renewable energy options do exist for FSM and for Kosrae in particular (especially solar); however, no incentives currently exist for renewable energy technology development at either state or national level.

Private sector

The private sector contributes little to the GDP of Kosrae, with private-sector employment mainly comprised of wholesale and retail trade and automobile repairs. Subsistence livelihoods are still common, mainly through small-scale fishing and farming. Most formal employment is through the government, predominantly through the Public Administration and Defense or Social Security Departments (URS, 2005).

Tourism is a key area in Kosrae's Strategic Development Plan (SDP) that is highlighted for development. Tourism operators include hotels, snorkelling, diving and boating operators.

The Asian Development Bank (ADB) has worked with FSM and Kosrae administrations to work towards reforming the investment environment with a view to boost the local economies, in light of plans to gradually reduce compact-funded support over coming decades. However, Kosrae's constitution disallows foreign investors to buy land, only allowing them to set up long-term lease contracts with Kosraeans.

Education

State governments in FSM have responsibility for education. All children in FSM are required by law to attend school through to eighth grade, and many continue to college after graduating high school. As a result, FSM has a high literacy rate. All students learn English as it is the official language of FSM.

The National Infrastructure Development Plan earmarked US$135.4 million for education infrastructure spending across 20 years between 2004 and 2023.

Kosrae has seven public schools, one of which is a high school. Around 2,300 students attended these schools in 2004. All of these schools are community-managed, and are in excellent condition.

The National Infrastructure Development Plan describes issues relating to education infrastructure including poor maintenance (including failure of water and power supplies); a number of schools in a highly deteriorated state; a shortage of supplies includes furniture, equipment, books and tools; a lack of diverse facilities (such as music rooms, auditoriums, vocational training facilities); inadequately qualified teachers; inappropriate school curricula; and a lack of vocational training.

Grants and US education programs are used to support many FSM students to attend the College of Micronesia, the University of Guam and US colleges.

Transport

Roads and pedestrian facilities are a key priority sector for expenditure under the Infrastructure Development Plan, with US$120.9 million earmarked for spending in the sector in the 20 years to 2023. An additional US$88.5 million investment for maritime transportation and US$68.4 million for air transportation has also been planned.

Most residents of the main islands of FSM own vehicles, making roads a crucial infrastructure sector. In 2003, Kosrae had around 19 paved miles and 6-7 unpaved miles circumferential roads and a paved airport access road. These roads were reportedly in good condition; however, most lacked sidewalks. The paving of the entirety of the circumferential road was deemed to be a priority to avoid deterioration. Poor transportation was identified in the FSM Agriculture Strategic Action Plan as a key limiting issue for agriculture, resulting in limited market opportunities for farmers in FSM.

FSM depends heavily upon maritime transportation, and potential tourism income derives strongly from exploitation of marine resources – for which adequate maritime transportation infrastructure is required. Kosrae's main port is Okat

Port, a natural harbour on the northwest coast of Kosrae. The port serves only a small number of vessels and is capable of only serving one vessel at any time. In 2003, the storage facilities of the port were earmarked for upgrade through the Infrastructure Development Plan.

Each of the four FSM states has a small international airport. Generally, facilities at these airports are inadequate for accommodating cargo, and interface with public transportation is poor. Kosrae is in need of a cargo terminal with cold storage facilities.

2

CLIMATE CHANGE

2.1 CLIMATE CHANGE PROJECTIONS FOR KOSRAE

2.1.1 Observations

Situated in the east of the FSM, Kosrae's climate is characterized by regular rainfall and high humidity, with an annual average temperature of 81 degrees Fahrenheit

(27.2°C). Observational data shows annual and seasonal maximum and minimum temperatures in FSM have increased in Pohnpei since records began in 1952. Data relating to the wet season shows a decreasing trend in rainfall since 1950. There is no clear trend for dry-season rainfall.

Sea-level rise has occurred in the ocean surrounding FSM at a rate of 10 mm per year since 1993. This rate is above the global average of 2.8-3.6 mm/per year. The ocean has also become more acidic as a result of the ocean's absorption of carbon dioxide.

2.1.2 Future climate

Temperature

Temperature projections for the eastern part of FSM, where Kosrae is located, are shown in Figure 3. The figure shows a temperature increase for all emission scenarios, and climate models also indicate sea-surface temperatures are projected to increase.

Consistent with global projections, Kosrae will experience an increase in the number of hot days and warm nights and a general decline in cool weather.

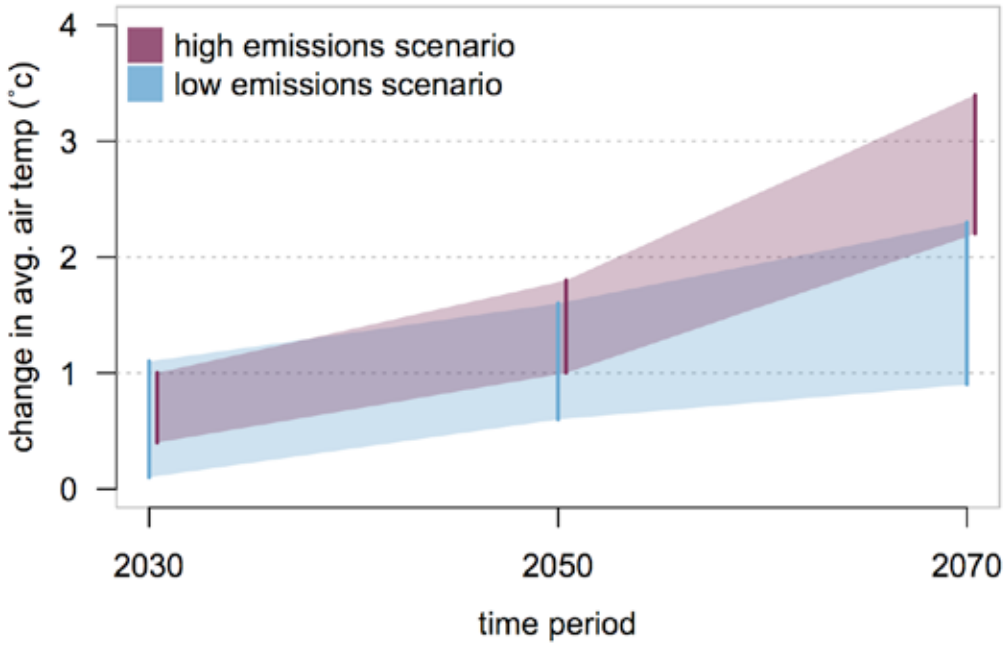


Figure 3: Projected annual average air temperature changes for the Federated States of Micronesia for high and low emission scenarios and 3 time periods.

Note: Values represent 90% of the range of the models and changes are relative to the average of the period 1980-1999. Source: Australian Government Bureau of Meteorology, 2011.

Rainfall and drought

Rainfall projections from global climate models carry some uncertainty, with more common inconsistent results than for temperature.

Despite this, almost all models predict an enhanced hydrological cycle, with increases in annual and seasonal rainfall and a reduced frequency of droughts. Rainfall patterns are also linked closely to El Niño Southern Oscillation (ENSO) cycles; however, there is considerable uncertainty in how climate change will affect ENSO in the future.

Severe weather

Projections for typhoon frequency and severity in FSM show a decrease in typhoon frequency in the 21st century as well as a decrease in severe storms. Again, considerable uncertainty surrounds such projections and there remains a chance for typhoons and severe storms to affect Kosrae.

Sea-level rise

Sea level is expected to continue to rise across FSM consistent with current trends. Figure 4 shows projections for FSM up to 2070 for the three emission scenarios while Figure 5 shows observational data up to 2005 and projections to 2100.

Combined with natural variability, sea-level rise will enhance impacts of storm surges and flooding in Kosrae. For Kosrae, approximately 97% of all current high tides are less than 2 m high. Sea-level rise will alter these statistics as follows (see Ramsay et al., 2013):

- In the 2030s, the high-tide level of 2 m will be exceeded by 12% of all high tides.
- In the 2050s, the high-tide level of 2 m will be exceeded by 27% of all high tides.
- In the 2070s, the high-tide level of 2 m will be exceeded by 69% of all high tides.
- In the 2090s, the high-tide level of 2 m will be exceeded by 95% of all high tides.

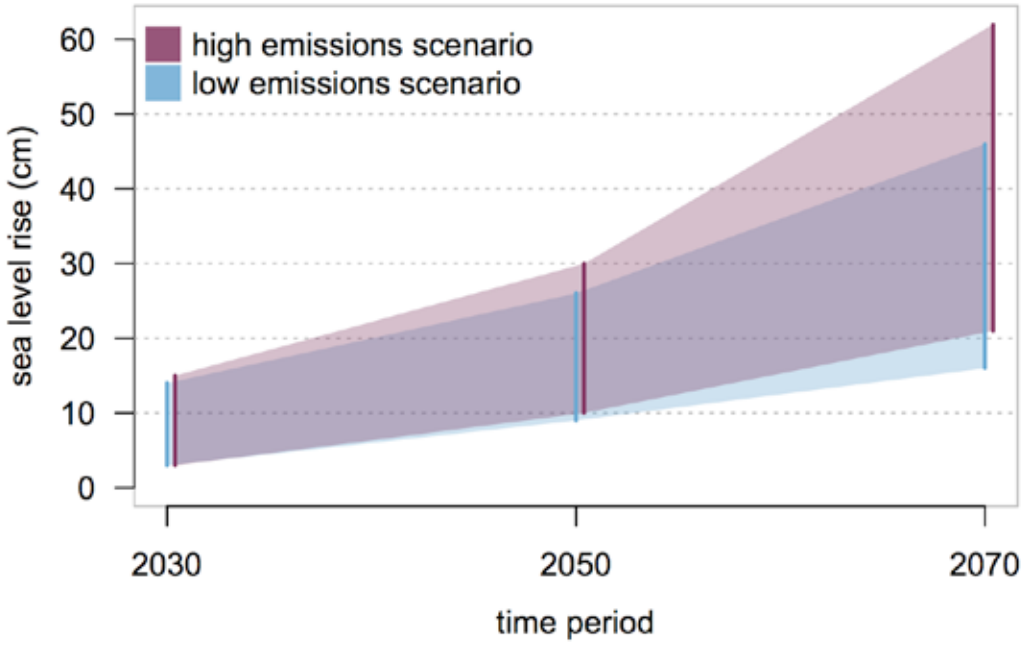


Figure 4: Sea-level rise projections for FSM under two emission scenarios and three time periods.

Source: Australian Government Bureau of Meteorology (2011).

Ocean acidification

Increased ocean acidity is predicted under all three emission scenarios for FSM. Reef ecosystem health is likely to be affected by such changes, with additional pressures such as coral bleaching and storm damage compounding the impacts.

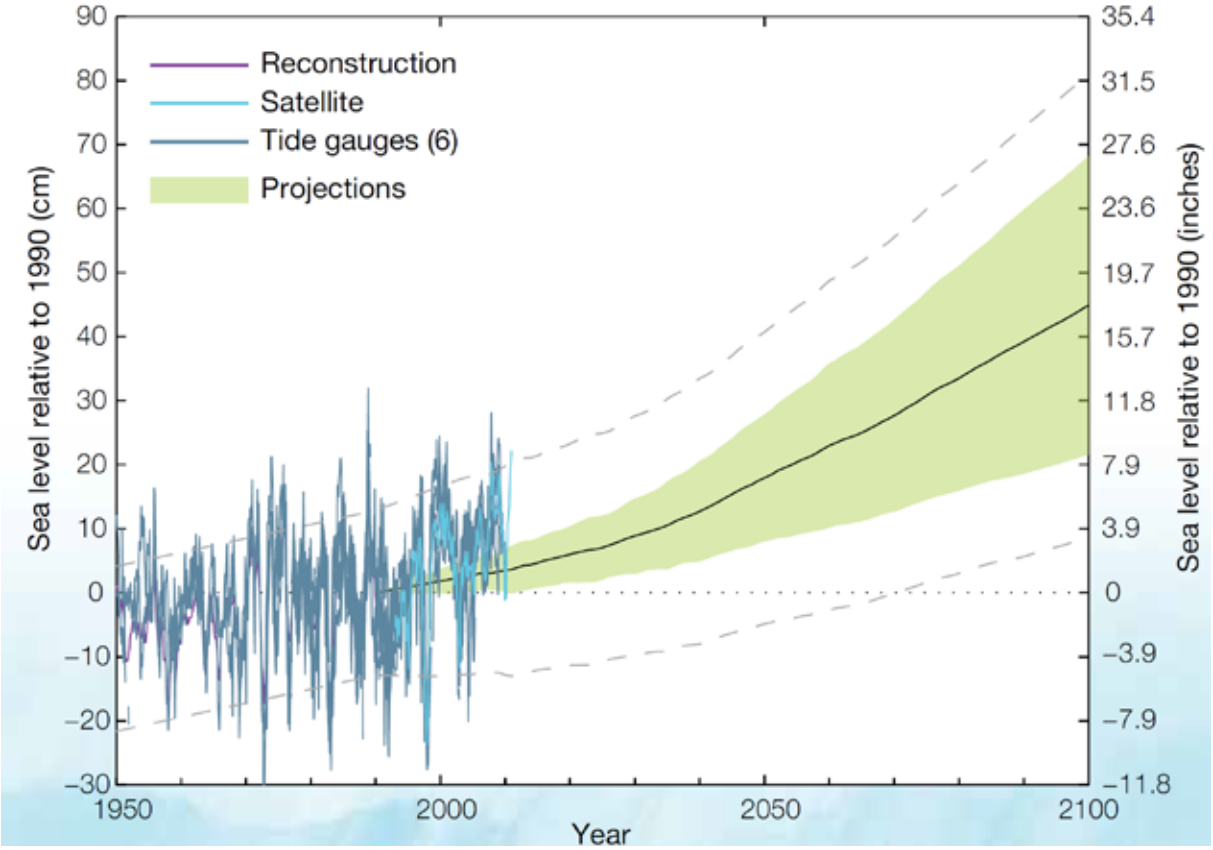


Figure 5: Observed and projected sea-level rise near Federated States of Micronesia.

Source: Australian Bureau of Meteorology (2011) Figure 6.

2.2 SECTOR VULNERABILITIES

As noted in Kosrae's Shoreline Management Plan (2013) which was developed through funding from German Federal Ministry for Economic Cooperation and Development (BMZ), adaptation 'will mean a much greater emphasis on preventative measures that remove exposure to the hazard', rather than a primary focus on impact reduction (e.g. through continuing to build seawalls). Preventative measures, particularly to cope with coastal erosion, are already being undertaken by many people in Kosrae, through both autonomous (initiated by individuals or households) or planned (initiated by governments and non-governmental organizations). Some adaptation measures, such as building seawalls and land filling, are short-term measures and considered to be unsustainable, given their potential to increase risks of coastal hazards. Greater consideration of where and how development and infrastructure is built, along with boosting natural protections (e.g. tree planting and protecting reef ecosystems) are far more sustainable adaptation and risk reduction measures. Table 7 describes how Kosrae's key sectors are vulnerable to climate change.

Table 7: Kosrae's key sectors and their vulnerabilities to climate change.

Sector	Projected climate change impacts
Water resources and sanitation	Kosrae is considered one of FSM's 'wet' states, each year receiving over 300 inches of rainfall. Climate change, and potential alterations to rainfall patterns, therefore poses only a moderate risk to water resources through drought, except when associated with intense El Niño events such as the event that caused the 1998 drought.
Agriculture	As noted in the Agriculture Policy, food and farming systems do not address the impacts of climate change sufficiently with gaps relating to biodiversity, sufficient skilled labour and supporting infrastructure. It is likely that sea-level rise will result in salinization of agricultural land, with coastal areas of Kosrae vulnerable to high seas and storm surge. Land loss via erosion is also likely, further reducing the availability of suitable land to grow crops.

Human health	Climate change is likely to enhance the risks for the potential of outbreaks of vector-borne diseases such as dengue fever due to an increase in mosquito breeding sites associated with a warmer climate and potentially higher rainfall conditions. Higher temperatures may also lead to increased transmission of water-borne diseases; for example, prolonged periods of high temperatures can enhance the conditions favourable to some types of diarrheal diseases and gastroenteritis. There is also an enhanced risk of outbreaks of diseases such as typhoid and cholera with contaminated water during and after flooding. As noted in FSM's National Climate Change and Health Action Plan, there is also a growing concern that climate change-induced impacts on crops and fisheries will exacerbated poor nutrition amongst FSM's populations. Furthermore, projected high temperatures may decrease the degree of physical activity, potentially increasing non-communicable diseases such as heart disease and diabetes. The rate of hospitalizations and deaths of the very old, very young and those with non-communicable diseases and other chronic illnesses such as cancer and cognitive impairment may also be impacted.
Infrastructure	Coastal erosion, driven by the combined effects of sea-level rise and development practices, will continue to threaten coastal infrastructure in Kosrae. Sea-level rise, combined with high sea swell events (as experienced in the recent past) pose a risk to infrastructure.
Fisheries, coastal ecosystems and biodiversity	Climate change stress will adversely affect Kosrae's natural protective ecosystem functions provided by coral reef systems, seagrass beds, mangrove strands, wetland areas and the coastal berm. Substantial negative impacts on coastal and marine ecosystems are likely. Rising ocean temperatures and ocean acidification (via increased concentration of carbon dioxide) may have significant adverse impacts on coral reefs, coastal ecosystems, and migratory fish stocks such as tuna, which represent a substantial economic resource for Kosrae.
Private sector	While only relatively few in Kosrae, private sector stakeholders represent a diverse cross-section of the economy, thus climate change impacts vary on Kosrae's businesses. Tourist operators are concentrated in the coastal zone, with sea-level rise, high seas/swell events and changes in heavy rainfall and severe weather posing as greatest threats to their businesses. Climate change impacts on marine ecosystems, in particular coral reefs; often a drawcard for tourists visiting Kosrae, are likely to be negatively impacted by rising sea surface temperatures and ocean acidification. Additional impacts include the potential of high seas/swell events to disrupt commercial transport access, posing a risk to both incoming people and supplies for the island.

2.3 FSM'S INSTITUTIONAL RESPONSE

Actions to address risks associated with climate change and disasters have already been taken through the development of legislation, policies and plans in FSM and Kosrae, and these are described below.

Nation Wide Integrated Disaster Risk Management and Climate Change Policy (2013) – superseding the Nation Wide Climate Change Policy of 2009

As noted in Section 1 (Governance Arrangements) and also due to the cross-cutting nature of disaster and climate risk management, implementation of the national policy for climate change and DRM is a shared responsibility between government, private sector, civil society and communities. The policy notes that national and state governments will lead the promotion, coordination and monitoring the implementation of the policy.

The constitutional arrangements in FSM require the state governments to be responsible for implementing the Disaster Risk Management and Climate Change Policy.

Local government, private sector, civil society and development partners are also noted to have roles to play in implementing the policy.

Climate Change Act (2013)

The Climate Change Act introduces legal obligations for certain national government departments and agencies of FSM. The Act states that by 1 October, 2014 certain departments must prepare plans and policies on climate change (consistent with the National Wide Integrated Policy) and the OEEM is responsible for overall implementation. Annual progress reporting of implementation of the policy is also stated under the Act.

Disaster Relief Assistance Act (1989)

This Act provides details of roles and responsibilities for times of disaster, including presidential authority, national government authority and state responsibilities. States are required to develop state disaster plans to qualify for national assistance. States wishing to request overseas support must first submit their request to the President. The Act also

describes the Disaster Relief Fund, with contributing funds from the Congress of FSM, State legislatures, US grants and international organizations. Funds can be drawn upon after formal declaration of a disaster by the State Governor, and authorization by the President.

Multi-State Multi-Hazard Mitigation Plan (2005)

FSM's Multi-State Multi-Hazard Mitigation Plan was developed in 2005 and includes considerable detail regarding identification of risks and potential actions to overcome them. The Plan also includes details regarding governance in times of disaster at both national and state levels.

Kosrae State Law No. 10-2 (2011)

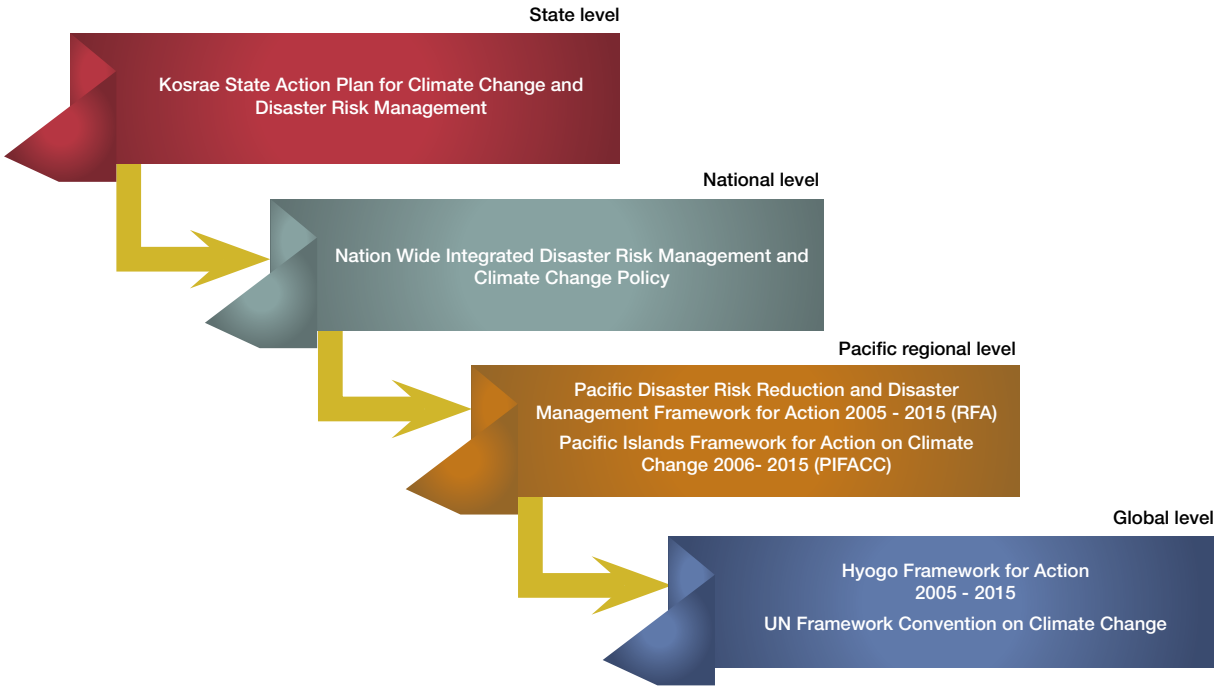
This law requires climate change and adaptation to be formally taken into consideration for future development activities and mainstreamed into sector plans.

Kosrae Disaster Preparedness Plan (2011)

The plan establishes the Kosrae State Disaster arrangements DCO.

2.4 LINKAGES TO NATIONAL, REGIONAL AND INTERNATIONAL POLICIES AND FRAMEWORKS

Kosrae's State Action Plan for Climate Change and Disaster Risk Management represents the operational plan for action, which fits into the nested hierarchy of policy instruments to address climate and disaster risk from local to global level.



At the regional level, work is being undertaken to integrate strategies for climate change and disasters through the Strategy for Climate and Disaster Resilient Development in the Pacific that will replace the RFA and PIFACC, post-2015. Kosrae's State Action Plan will support this strategy through its integrated approach of addressing local disaster and climate change risks. As noted in FSM's National Wide Integrated Policy for Climate Change and Disaster Risk Management, instruments such as Kosrae's Joint State Action Plan will assist in meeting regional and international treaty obligations and objectives to which the Government of FSM has agreed.

3

APPROACHES TO RISK REDUCTION

3.1 CURRENT AND RECENT APPROACHES

Current and recent projects relating to disaster risk management and climate change in Kosrae include:

- Pacific Adaptation to Climate Change (PACC) Project (SPREP): Building resilience to climate change for Pacific communities – for FSM Kosrae was selected as the PACC location, with a focus on climate proofing roads and disseminating relevant climate proofed road standards.
- Pilot Program for Climate Resilience (SPREP, SPC, PIFS, ADB and the World Bank): piloting and demonstrating ways in which climate risk and resilience may be integrated into National, Sectorial and Local development planning and action.
- Installation of Tide Gauge in Lelu Harbour (KIRMA, NIWA, SPREP and FSM PACC, funded by GEF/UNDP).
- Coping with Climate Change in the Pacific Islands Region (CCCPIR): In partnership with NIWA, this project updated the Shoreline Management Plan.
- CADRE program – School Sea Wall Project (IOM).
- PASAP (Agriculture).
- Community Disaster Response Training (MRCS): Bridling community resilience by empowering community members in disaster management skills and climate change awareness.

Organizations with responsibility and interest in disaster and climate change related issues in Kosrae include the following:

- Disaster Coordination Office (DCO).
- Kosrae Island Resource Management Authority (KIRMA).
- Kosrae Women Association.
- Micronesia Red Cross Society (MRCS).
- Pacific Adaptation to Climate Change (PACC) Project Management Unit.
- College of Micronesia (Kosrae campus).
- Kosrae Women in Farming.
- Kosrae Youth Development Association.
- Kosrae Conservation and Safety Organization (KCSO).
- Kosrae State Department of Resources and Economic Affairs (DREA).

Recent disaster risk reduction and climate change-related achievements are presented in Box 1.

As part of the consultation process in 2012 for the Hyogo Framework for Action 2005-2015, an assessment was made regarding the factors contributing to the achievements listed in Box 1. These include:

- Growing political appreciation for the importance of disaster risk reduction and climate change.
- Increased engagement of regional and international development organizations on issues of disaster risk management and climate change.
- Multi-sectoral nature of disaster risk management and climate change ensures that awareness of these issues is raised in a broad range of national agencies, mostly through their sectoral channels of regional and international cooperation.
- Importance attributed to disaster risk management and climate change as a development issue at the regional and international level.

Box 1: Recent achievements for FSM

- Nation Wide Integrated Policy for Climate Change and Disaster Risk Management and Climate Change Act to institutionalise mandatory consideration of climate and disaster risks.
- Kosrae Emergency Operation Centre (EOC) completed in 2011-2012.
- Kosrae State Law No. 10-2 (2011) takes climate change and its adaptation into consideration for future development activities.
- Upgrade of communication systems for Early Warning. Installation of systems in the islands ongoing with completion date of March, 2013.
- A Climate Change Tool Kit developed by the Micronesian Conservation Trust and The Nature Conservancy offers a standardized methodology for addressing vulnerability and adaptation participatory assessment research and planning.
- IOM has developed a standardized template for collection of data relevant for contingency planning (logistical).
- Increased use of sector-specific risk assessments (e.g. agro-forestry, mangrove management, coastal erosion, coral bleaching and in-shore sedimentation).
- The FSM Infrastructure Policy and Implementation Committee (IPIC) developed design criteria in 2006 for use by engineers designing projects funded under the Compact Infrastructure Sector Grant. The design criteria addresses increased wind speed, seismic vulnerability, flooding from both rainfall and tidal surges.

Source: HFA Consultation (2012).

3.2 GAPS AND FUTURE NEEDS IN KOSRAE

Numerous studies of vulnerability and approaches to address various risks have already been undertaken for both FSM and Kosrae. Table 8 consolidates some of these prioritised actions that may be addressed in Kosrae's State Action Plan for Climate Change and Disaster Risk Management.

Table 8: Areas for action to address current and future risk in Kosrae.

Area for improvement/action	Source of information
Community-level action needed: Greater focus on implementation of community level activities and need for a dedicated government budget to support activities at the community level. The need to provide communities with good examples of risk reduction activities; and adopt whole-of-community approaches where the population at large must assume responsibility for such change.	HFA Review Process 2012; Kosrae Shoreline Management Plan
Increased awareness and understanding of CC and DRM: Improve understanding of DRR and climate change among government planners to enhance recognition of DRR and CC as a core government development function. Reinforce the integration of DRR and CC into development planning and reporting through regular formal reminders during the annual planning cycle. Strengthen accountability through improved community monitoring and participation; and climate change is viewed as having its origins in developed countries and the feeling was that developed countries should pay for the negative impacts on small island countries.	HFA Review Process, 2012
Strengthen the governance capacity: Support for the under-resourced National and State Disaster Management Offices in terms of core operating budget, staff and equipment; and National and State Disaster Management Offices are under-resourced in terms of core operating budget, staff, and equipment; and no dedicated government budget for community-level DRM and CC activities.	HFA Review Process 2012
Development and Infrastructure planning: Strengthen the integrity of the development consent process and environmental impact assessments; and the need to rigorously apply land-use planning and actively enforce building codes.	HFA Review Process 2012
Improved understanding of decision makers: Simplification and clarification of the concepts and terms used in the post-2015 regional and global DRR and climate change frameworks; and need for awareness raising on and dissemination of regional and global DRR and climate change frameworks at national level; and in a highly competitive environment, government planners do not see DRM and CC as a core government development function, preferring to rely on funding from development partners; and greater emphasis on how to achieve sectoral integration as DRR does not yet feature strongly in sectoral planning; and DRM and CC are exploited for political gain – politicians are quick to respond after a disaster, often with unrealistic promises of assistance.	HFA Review Process 2012

Private Sector Development: Small Business Development Centers (SBDCs) assist the development of small businesses are located in each of the four states. They provide business advisory services and training and in some cases help clients to prepare loan applications. Chuuk, Kosrae, and Yap SBDCs have become part of the University of Guam's Pacific Island Small Business Centre Development Network and are partially financed by the United States Small Business Administration under cooperative agreements. SBDCs have generally recorded increases in the annual number of trainees and community awareness programs, but the agriculture sector has not yet managed to take full advantage of these services.	Agriculture Policy (page 31)
Strengthening investment criteria and the Development Review Permit process: This action is suggested to limit new development in areas at risk from present and future coastal hazards. An additional suggestion from the Plan is to develop incentive mechanisms to encourage development/redevelopment away from areas at risk from present and future coastal hazards.	Kosrae Shoreline Management Plan
Incorporating appropriate climate-proofing guidance into existing policy and legislation: This would ensure new infrastructure and buildings are designed to withstand weather and climate extremes including the future effects of climate change (climate proofing) over the proposed design life of the structure.	Kosrae Shoreline Management Plan
Leverage adaptation finance: Take advantage of international adaptation financial support available now and recognise that such opportunities may not be as accessible into the future as the effects of climate change increase for all nations.	Kosrae Shoreline Management Plan
Disaster preparedness and response: Kosrae state has limited legal and regulatory capabilities regarding disaster mitigation. It is recommended that such capabilities are addressed as a priority to reduce risk of disasters and climate change, as well as to boost development planning in Kosrae.	URS, 2005 – Table 5.3-3

4

JSAP DEVELOPMENT PROCESS

JSAP development in Kosrae began with a broad suite of consultations with key stakeholders in late August/early September 2014. The consultation process was coordinated by the Disaster Coordination Office, with support from the national Office of Environment and Emergency Management (OEEM) and SPC. From Kosrae State Government, JSAP development was led by Kosrae State Government's Emergency Taskforce, which is comprised of representatives from the following departments and agencies:

- Disaster Coordination Office (DCO).
- Pacific Adaptation to Climate Change (PACC).
- Kosrae Port Authority.
- Kosrae Broadcast Authority.
- Kosrae Utilities Authority.
- FSM Telecom.
- Department of Transportation and Infrastructure.
- Department of Administration & Finance.
- Department of Resources and Economic Affairs (DREA), Division of Agriculture.
- Department of Health.
- Department of Education.
- Kosrae Island Resource Management Authority (KIRMA).
- Public Health and Emergency Program.
- Micronesia Red Cross Society (MRCS).

Consultation then consisted of one-on-one meetings with government, followed by multi-stakeholder workshops with key groups to facilitate the development of actions to address outstanding vulnerabilities for Kosrae. Individuals and groups for consultation ensured a range of perspectives were included, as seen in Figure 6 and photos in Figure 7. Representatives from the Pacific Adaptation to Climate Change (PACC) project were also key stakeholders who both assisted with the process as well as provided critical detail and understanding of the climate change context in Kosrae.

Figure 6: Organizations consulted in the JSAP development process.

Figure 7: Photos from Kosrae JSAP consultations (August-September 2014).

Given the relevance of the Kosrae Strategic Development Plan (SDP), the JSAP development process was framed in such a way that clear links to the SDP were constantly made. This alignment reassured stakeholders that the SDP remained a key and 'living' document for Kosrae, and the JSAP could be seen as an action plan that 'climate and risk-proofs' the SDP. This is seen is Figure 8 below.

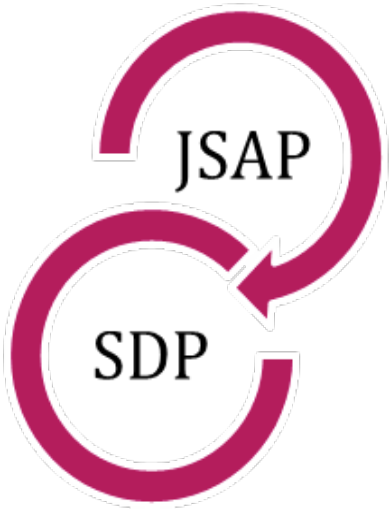


Figure 8: Links between SDP and JSAP.

Consultation with all groups consisted of a series of steps to ensure discussions were framed with the disaster and climate change lens, while at the same time considered in terms of sectors present, and actions already identified, in the SDP. The steps taken consisted of the following:

Step 1

Identification of key hazards affecting Kosrae (from literature, and from personal experience). Overall results from participants are seen in Figure 9, showing high sea/swell events dominating as the key hazard as identified by stakeholders.

Step 2

Identified key vulnerabilities (considering key hazards and climate change projections for Kosrae).

Step 3

Identified key strengths/capacity in communities and government (considering key hazards and climate change projections for Kosrae).

Step 4

Ranking the five elements of capacity, given vulnerabilities and strengths. This step involved stakeholders using a matrix which included the five elements of capacity (human, social, natural, physical, financial), and individually rating how they saw each element in Kosrae. Combined results for all stakeholders revealed where the strengths and gaps were for the development of actions (see next step, and results in Figure 10).

Step 5

Development of key actions to address gaps, and identification of responsible agencies to lead the action. This step was undertaken in two phases, firstly in small groups during group consultations, and secondly at the multi-stakeholder workshop through a visioning exercise (using 'back-casting' techniques).

The government's Emergency Taskforce then met to verify and validate actions and leading agencies, and to review objectives under each sector. Sub-actions were also identified to allow for estimated costs to be developed for each activity.

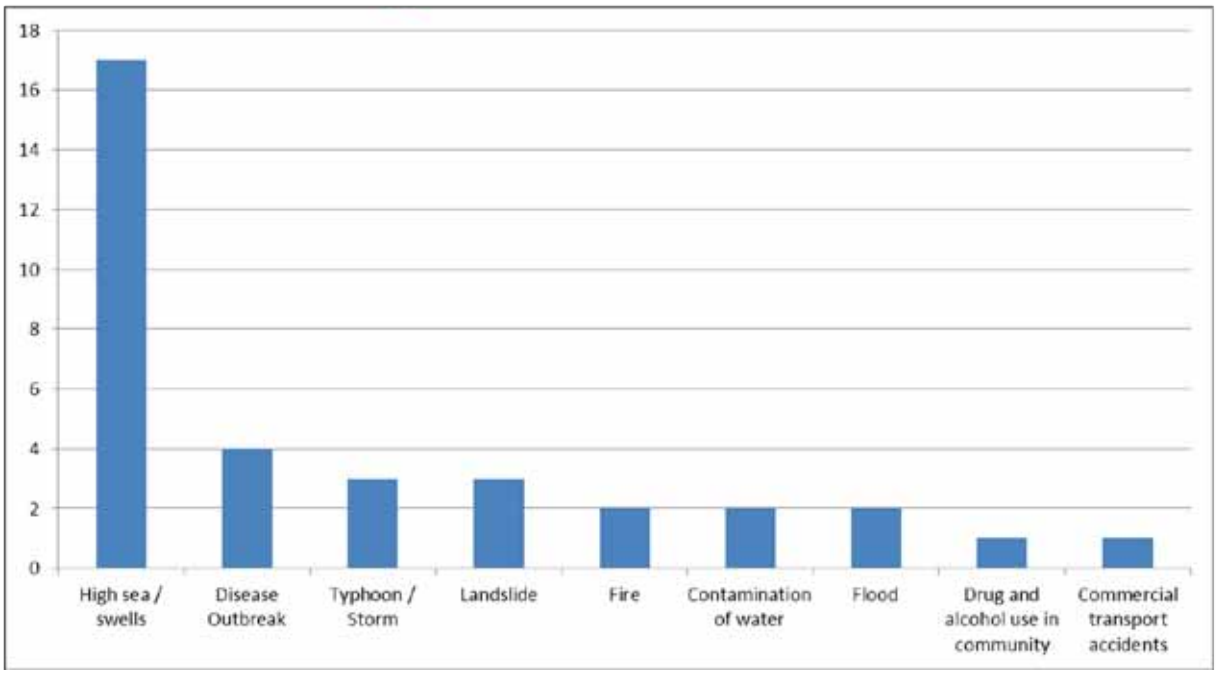


Figure 9: Key hazards identified from stakeholder consultations.

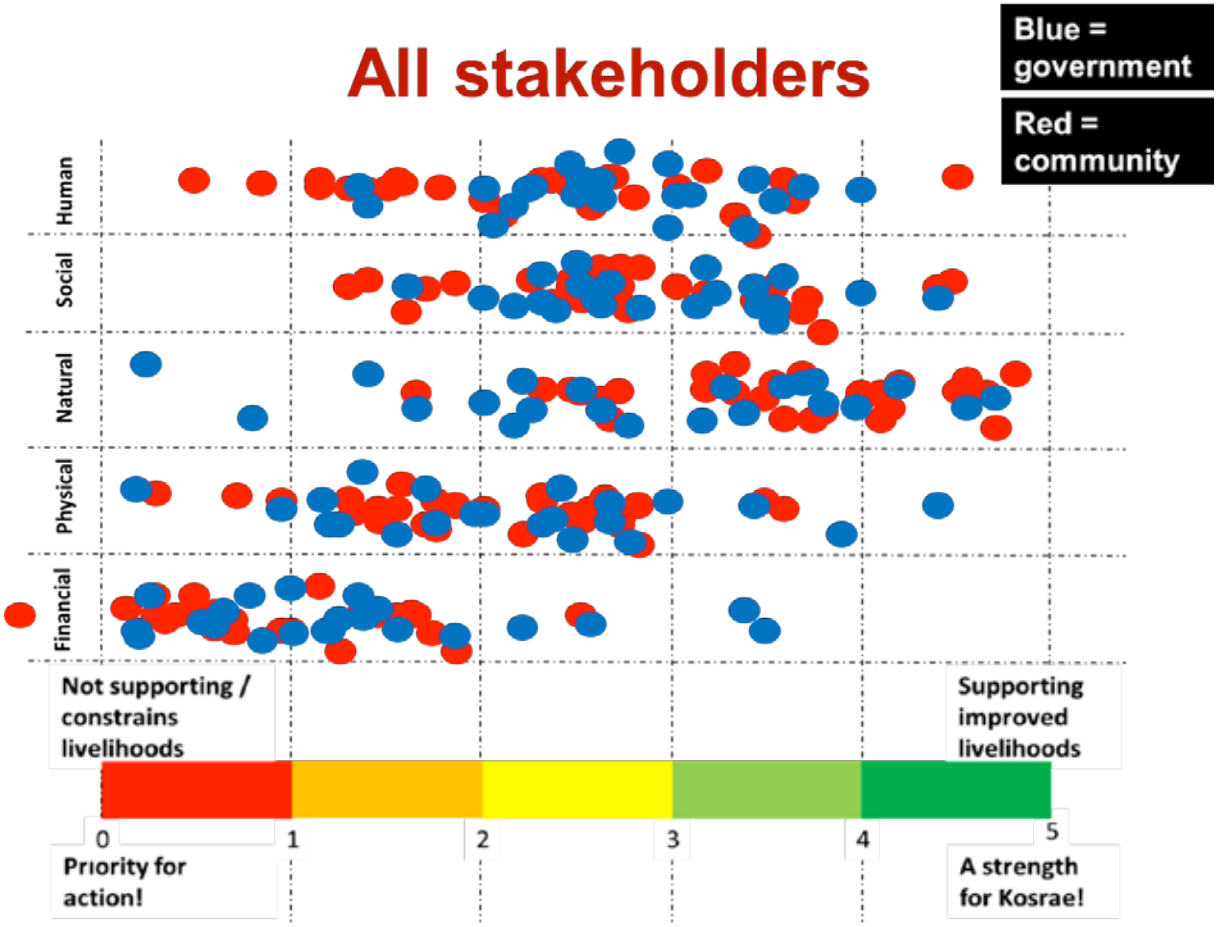


Figure 10: Results from consultations – rating of elements of capacity.

5

INSTITUTIONAL ARRANGEMENTS

The institutional arrangement for the integration of DRM and CCA in Kosrae is illustrated in the figure below.

The responsibility of the JSAP will reside with the Joint Risk Management (JRM) Network as well as the Task Force. The JRM Network will include membership from the NGOs and private sector while the Task Force are mainly from government agencies.

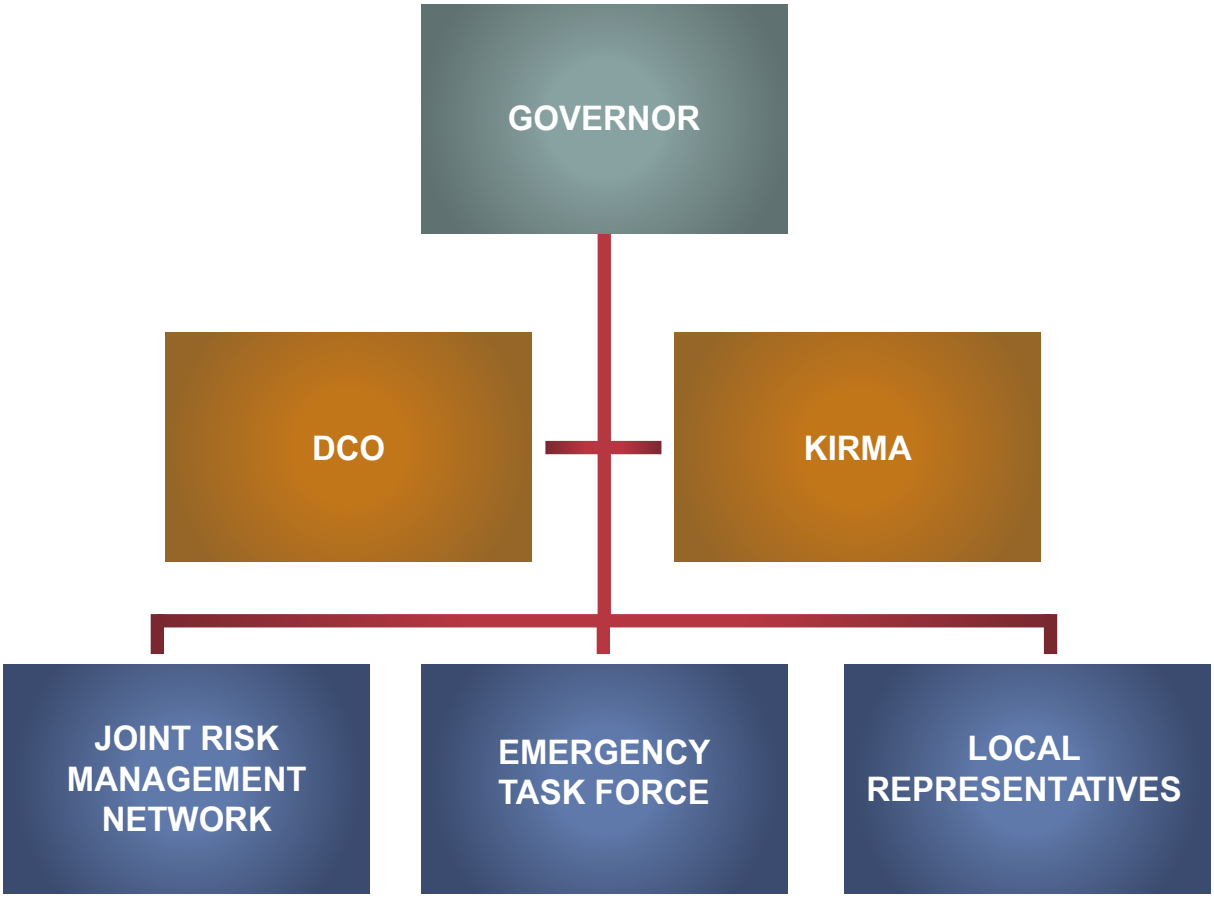


Figure 11: Kosrae's JSAP implementation arrangements.

MONITORING AND EVALUATION

The monitoring and evaluation (M&E) of the JSAP is intended to achieve a number of objectives:

1. To provide for regular reports to the Kosrae State Government on the progress of JSAP implementation.
2. In relation to 1, provide a mechanism to stimulate discussion and identify new initiatives that may evolve from the implementation of targeted actions.
3. To provide a mechanism for feedback and acquittals to donor partners and organizations of the funds used and progress made in relation to JSAP implementation.

The responsibility for monitoring and evaluation of the JSAP will be vested in the JRM Network and the Emergency Taskforce, who will work closely with the OEEM at the national level, in the data gathering and analysis phase. Members of the JRM Network and the Emergency Taskforce will develop appropriate templates for all M&E reports; however, pre-existing frameworks (such as those developed for the Strategic Development Plan) will be drawn on to allow for close alignment of Kosrae's state strategies and reducing duplication in reporting requirements. Additional components of the JSAP M&E framework are as follows:

- Setting of specific, well defined, tangible goals and indicators.
- Monitoring on a quarterly basis to coincide with government budgetary requirements.
- Reviewing the M&E framework regularly to ensure it maintains feasibility and is meaningful in tracking progress.
- Including quantitative and qualitative measures of progress.
- Including innovative tools for monitoring change, and potential benefits, at the community level.
- Ensuring results of M&E are taken back to the communities.
- Regular meetings of the JRM Network and the Emergency Taskforce to report to monitor JSAP progress.

In order to ensure that the outcome of M&E reports lead to further strategic planning in relation to climate change and disaster risk management (and thus in turn ensure that a dynamic process of planning is maintained), members of the JRM Network and the Emergency Taskforce will instigate a formal review of the JSAP following the first three years of implementation. The result of such a review may be adapted as the 'second phase' of a rolling JSAP program. Ultimately, the challenge is to formally mainstream or incorporate the issues related to climate change and disaster risk management into the state and national sustainable development strategy, sectoral and corporate plans and budgets.

7

ACTIVITY MATRIX

Table 9 provides a description of the sectors for the JSAP (aligning with Kosrae's SDP), along with actions, sub-actions and the lead and supporting agencies.

Table 9: JSAP activities.

SECTOR 1: HEALTH			
Objective 1.1: Strengthen policy and technical capacity of the health sector in Kosrae			
Action	Sub Action	Source of Action	Lead and Supporting Agencies
1.1.1 Increase immunization program for communities in Kosrae	Recruit additional manpower	JSAP Consultations	DHS, DHA, National DOH, CDC, WHO, SPC
	Undertake consultation and training		
1.1.2 Strengthen vector surveillance	Technical assistance to develop vector surveillance program	JSAP Consultations	DoH
	Training in vector surveillance		
	Procure relevant equipment and upgrade facilities		
	Enhance community partnerships and support		
	Review manual of procedures on vector surveillance		
1.1.3 Strengthen port and airport health quarantine	Develop regulations	JSAP Consultations	DoH
	Improve supplies and manpower		
1.1.4 Conduct fire safety assessment of the Kosrae State Hospital and implement recommendations	Technical assistance to assess fire safety	JSAP Consultations	DCO, DHS
	Procure additional fire equipment as identified in assessment		
1.1.5 Develop and disseminate Standard Operating Procedures (SoPs) on handling hazmat	Identify hazmat staff responsible for handling hazardous materials from current staff	JSAP Consultations	DHS, national DOH, WHO, SPC
	Purchase appropriate PPE		
	Undertake training and awareness programs		
1.1.6 Develop and implement health care Capacity Development Plan (Human Resource Development)	Support existing Human Resources for Health Plan	SDP	DHS, DOH, WHO, DFAT, JICA
1.1.7 Conduct regular facility and equipment maintenance through a facilities or infrastructure Maintenance Plan	Technical assistance (develop facility maintenance plan)	JSAP Consultations	DOH, DHS, national government, JICA, US PCV
	Training in specific roles required		
1.1.8 Train health staff on hospital waste management	See 1.1.5	JSAP Consultations	DOH, DHS
1.1.9 Amend existing laws/ policy to address health issues and challenges (i.e. SIN Tax)	Revolving Fund to be amended to also other needs other than medical supplies	JSAP Consultations	DoH, KSL, KSG
	A percentage of the SIN Tax collection to be added also for NCDs and other health programs		
	Promoting good health		
1.1.10 Facilities (e.g. storage) and transportation provided for proper transport, storage, inventory and dispensing	New hospital will address this	SDP	DoH

1.1.11 Strengthen blood donor capacity	Establish a donor database Train staff on blood bank management		DHS MRCS
1.11.12 First aid training for existing and potential responders	Update first aid certification Train additional responders including youth, women and community volunteers		DHS MRCS IOM
Objective 1.2: Strengthen and support the use of local traditional medicine			
1.2.1 Incorporate and support the practice and use of local medicines in the treatment and prevention of diseases	Consult local experts to develop a handbook on Kosrae local medicines	JSAP Consultations	DSH, DREA, PACC, SPC, WHO, Municipal government, KCSO
Objective 1.3: Raise the level of public education and technical awareness about health-related risks and the links to climate change and disasters			
1.3.1 Develop health sector specific communication and awareness raising strategy to contribute to State Wide Communications Strategy	Hire a health advocate position Conduct community workshops and training	JSAP Consultations	DoH, Municipal government
1.3.2 Health curriculum strengthened at the Elementary and Secondary Schools	Joint meeting of DOH and DOE to map out areas of strengthening	SDP	DoH, DoEd, PACC, OEEM
1.3.3 Tailor health awareness programs targeting school children and youths to increase their involvement in disease prevention & control	Develop and disseminate brochures and educational materials for schools Same workshop as in 1.3.1	SDP	DSH, DoEd, MRCS
1.3.4 Conduct an awareness program on the nutrition value of locally grown food	Utilize SPC chart on Local food values to conduct community workshops and training, same as 1.3.1	SDP	DSH, Municipal government
1.3.5 Develop awareness program with focus on promoting diet, inclusive of yellow variety crops, and exercise	Same position as in 1.3.1 Same position as in 1.3.1	SDP	DoH, Municipal government
1.3.6 Provide success stories of impacts on family livelihood, lessons learned and recommendations	Same position as in 1.3.1 Same position as in 1.3.1	SDP	DoH, Municipal government
1.3.7 Increase community awareness on disaster risk and epidemic disease	Same position as in 1.3.1 Same position as in 1.3.1	JSAP Consultations	DoH, MRCS, Municipal government

SECTOR 2: EDUCATION			
Objective 2.1: Develop and implement an ongoing climate change and DRM education and awareness program through the formal education system			
Action	Sub Action	Source of Action	Lead and Supporting Agencies
2.1.1 Strengthen capacity of teachers to deliver lessons incorporating climate change and disaster risk management	Provide training to all classroom teachers	JSAP Consultations	DoEd, IOM
	Collaborate with regional resource laboratories (SPREP, PREL, IOM, SPC, McREL, Northwest Eduction Laboratory, etc)		
	Invite environmental agencies (KIRMA, PACC, KCSO) to conduct educational program at schools on selected topics		
	Conduct classroom observations/Feedback		
	Develop integrated lessons to include CCA/DRM		
	Review lesson plans		
2.1.2 Develop materials and resources relevant to Kosrae climate change and disaster context	Develop scope of work for project	JSAP Consultations	DoEd, KIRMA, IOM
	Secure funding for project		
	Engage a local TA to support materials and resource development		
	Review scope of work with contractor(s)		
	Monitor implementation of project		
	Evaluate end product of project		
	Publish teaching materials		
2.1.3 Monitor curriculum delivery and teaching strategies all teachers through prepared and submitted lesson plans by each teacher	Review all lesson plans submitted by teachers	JSAP Consultations	DoEd
	Conduct classroom observations		
	Provide post-evaluation on teachers' observation		
	Conduct mini-workshops on best practices/lesson learned		
2.1.4 Provide appropriate facilities or environment inclusive of laboratories or shops, and information resource to support learning centers	Design a plan	JSAP Consultations	DoEd
	Seek & Secure Funding		
	Identify/designate science classrooms in existing structures		
	Remodel designated science classrooms to accommodate delivery of science instructional activities		
	Equip all science classrooms with scientific instruments/tools		
	Training of appropriate staff		
2.1.5 Disseminate all pertinent information regarding school activities and governance to the parents and stakeholders	Conduct quarterly PTA meetings	SDP	DoEd
	Conduct parental workshops		
	Provide newsletters, pamphlet, posters, radio announcement		
2.1.6 Revitalize use of traditional skills through education system	Invite senior citizens to share on traditional skills/ knowledge on CCA/DRR	SDP	DoEd
	Integrate lessons to include traditional skills/ knowledge		
Objective 2.2: Develop and implement an ongoing climate change and DRM education and awareness program through the formal education system			
2.2.1 Develop sector specific communication and awareness raising strategy to contribute to State Wide Communications Strategy	Pass out flyers, posters, newsletters to parents	JSAP Consultations	KIRMA, DCO
	Disseminate announcements to parents		

2.2.2 Develop outreach program / fellowships to share lessons learned in communities across Kosrae	Invite environmental groups (agencies) to school sites	JSAP Consultations	KIRMA
2.2.3 Incorporate CC/DRR into existing Community Awareness Programs	Request Community Awareness Groups to include CC/DRR in public awareness	JSAP Consultations	KIRMA,DCO, DHS, MRCS
2.2.4 Provide awareness program, workshops, trainings to all stakeholders on: - Disaster/Preparedness Plan - Disaster & Climate Change Risk Reduction/ Adaptation - State Disaster Plan	Conduct Quarterly PTA meetings/ Workshop	JSAP Consultations	KIRMA,DCO
	Develop schedule for appropriate environmental groups to meet with parents		
	Provide allowance for all participants		
2.2.5 Ensure public awareness activities reach to disability community and their carers	Conduct meetings with Kosrae Special Parents Network (KSPN)	JSAP Consultations	KIRMA,DCO, KSPN
	Provide available educational resources/ documents to parents		
2.2.6 Success of the PACC Project replicated in other sites in Kosrae	PACC seeks funding to replicate projects in other sites	SDP	PACC, KIRMA, DCO

SECTOR 3: ENVIRONMENT			
Objective 3.1: Improve coordination on disaster risk management and climate change adaptation			
Action	Sub Action	Source of Action	Lead and Supporting Agencies
3.1.1 Coordinate/facilitate DRR/CCA related activities - School Board / PTA - SIT - Joint Risk Management Network	Establishment and endorsement of JRMN	JSAP Consultations	DCO, KIRMA, PACC, JRMN members
	Organizing meeting and launching of JRMN		
Objective 3.2: Strengthen climate and disaster risk preparedness and response capacity			
3.2.1 Develop disaster response specific communication and awareness raising strategy to contribute to State Wide Communications Strategy	Develop and implement SAP	JSAP Consultations	JRMN, DCO
3.2.2 Establish community disaster plans for all villages and Municipal Governments	Include specific roles and responsibilities for groups in communities in times of disaster e.g. village leaders, women, youth, disabilities Conduct community disaster response training	JSAP Consultations	DCO, Municipal Governments, MRCS
3.2.3 Develop all sector's Disaster Plans, and ensure dissemination to all stakeholders	Assess and review existing Plans	JSAP Consultations	DCO and all sectors
	Develop Plans for missing sectors		
3.2.4 Businesses to develop disaster plans	Develop SOPs for businesses	JSAP Consultations	DCO and private sector
3.2.5 Establish Weather Station	Secure funding	JSAP Consultations	DCO and NWS
	Undertake capacity building		
3.2.6 Provide EOC with appropriate equipment	Maintain communications with OEEM regarding EOC needs	JSAP Consultations	DCO, OEEM

3.2.7 Improve evacuation routes (for flood and tsunami) and community awareness	Develop evacuation map	JSAP Consultations	DCO, PACC, KIRMA, DT&I, local government
	Publish map and conduct public awareness		DCO
	Install and maintain signage to direct the general public		DCO, DT&I
	Conduct a simulation exercise to test the map		DCO
	Maintain evacuation routes to be accessible at all times		DCO, DT&I, Municipal governments,
3.2.8 Conduct evacuation drills for all sectors (included in sector Disaster Plans) - Fire - High Surge - Flood/Tropical Storm	Support existing plans and strengthen plans at municipal level	JSAP Consultations	DCO, IOM and all sectors
3.2.9 Conduct training on Initial Damage Assessments (for mayors, sector leaders)	Identify relevant personnel	JSAP Consultations	DCO, MRCS,IOM
	Undertake training		DCO, IOM,MRCS
3.2.10 Undertake training for Search and Rescue operations	Support police and fisheries training	JSAP Consultations	DCO, OAG, DREA, KIRMA
3.2.11 Establish and strengthen local early warning systems	Develop MoU	JSAP Consultations	DCO, FSM Tel, Police, KUA, Municipal Offices, Churches
3.2.12 Review marine laws for boating regulations (include small boats) and strengthen as necessary	Support fisheries division	JSAP Consultations	DCO, DREA, OAG
3.2.13 Maintain Disaster Response Stockpiles	Maintain and improve storage facilities and information sharing with other partners		MRCS, DHS, DCO
Objective 3.3: Reinstate Fire Department			
3.3.1 Undertake certification of crew and volunteers	Develop MoU with Guam Fire Department	JSAP Consultations	DCO, OAG
3.3.2 Equip Fire Agency with appropriate equipment for domestic fires	Assess the need for, and costs of, fire equipment (trucks/protective gears)	JSAP Consultations	DCO, OEEM, OAG
Objective 3.4: Strengthen policy and technical capacity for shoreline management including monitoring and enforcement of regulations			
3.4.1 Strengthen awareness programs on environmental laws and regulations	Identify most appropriate range of approaches for community awareness	JSAP Consultations	KIRMA, PACC
	Undertake awareness raising (e.g. workshops, posters, radio announcements, brochures)		

3.4.2 Implement the Kosrae State Shoreline Management Plan	Continue developing and strengthening awareness programs with outreach activities focusing on natural coastal defence systems, climate change impacts and adaptation options		KIRMA, PACC, DT&I, DCO
	Development of inland primary road network and infrastructures from current locations over the next one to two generations		
	Ensure new development (property, infrastructure) is located away from areas at risk from present and future coastal hazards		
	Development of program to encourage existing property for resettlement to areas of low risk from present and future hazards		
	Incorporate a grant component into the loan programme to help encourage new property to be constructed in areas not exposed to hazards		
	Commence community and state discussions to develop a relocation strategy identifying potential approaches to support relocation from areas exposed to coastal hazards where no alternative land is available		
	Adopt a strategic approach for provisions of coastal defences to areas suitable for long term protection, and/or supporting enabling strategies for repositioning		
3.4.3 Strengthen and ensure enforcement of relevant environmental policies and laws	Support Kosrae Conservation Enforcement Taskforce (KCET) activities	JSAP Consultations	KIRMA, AG, KCET
	Undertake annual enforcement trainings		
3.4.4 Tree planting on coastal areas conducted at the community level	Continue to seek funds for tree planting projects	SDP	KIRMA and community groups, NGOs
	Undertake community consultations to encourage appropriate land use		
3.4.5 Strengthen and disseminate management scheme (zoning, re-plantation, etc…) for harvesting of mangrove trees	Undertake assessments to identify sites	SDP	KIRMA, DREA
	Undertake community consultations		
	Implement management scheme		
3.4.6 Identify resources/ equipment needs to support effective enforcement developed	Undertake inventory of equipment	SDP	KIRMA, OAG, K-CET
	Seek outside source for funds		
3.4.7 Financial resources for coastal protection measures secured from non-compact funding sources		SDP	KIRMA
3.4.8 Update, finalize and enforce Development Review Regulations	Adopted by Governor and KSL	SDP	** Discuss with KIRMA, K-CET
3.4.9 Environmental Impact Assessment Guidelines finalized and implemented	Revise document by stakeholders (consultation)	SDP	KIRMA, PACC, SPREP, OAG
	Adopt by Governor and KSL		
3.4.10 Alternatives to sand and cobbles explored and utilized	Promote use of glass as alternative to cobbles/ sand	SDP	KIRMA, Recycling Program
3.4.11 Review and assess Kosrae's 2003 Land Use Plan with new technical information (e.g. GIS on landslide risk)	Conduct consultations	JSAP Consultations	KIRMA, USGS, all relevant agencies
	Update plan, inclusion of disaster, hazard data/ maps		

Objective 3.5: Strengthen policy, technical capacity and community awareness for management of invasive species			
3.5.1 Review policy/ legislation on Quarantine Laws to prevent the spreading of invasive species	Undertake community consultation	JSAP Consultations	KIRMA, DREA, FSM Quarantine
3.5.2 Update Kosrae Invasive Species Taskforce – Strategic Plan	Conduct stakeholder consultations		
3.5.3 Consolidate invasive species programs under one agency	Endorsement of consolidation		
3.5.4 Amend Title 13 to allow KIRMA to board, inspect, all incoming vessels	Amend legislation		
Objective 3.6: Strengthen waste management			
3.6.1 Undertake clean up activities	Undertake community consultation on land and coastal environment	JSAP Consultations	KIRMA and community groups, DT&I, DHS
	Conduct island-wide terrestrial, coastal/marine clean-ups, followed with awareness programs		
3.6.2 Ensure appropriate implementation of Kosrae Solid Waste Management Plan	Develop legislation and policies to support effective, enforceable waste management activities		KIRMA, DT&I, DCO
	Amend legislation to clearly define roles and responsibilities for the different areas of solid waste management		
	Review Kosrae Solid Waste Management Plan to address post disaster wastes		
	Improve access to funding sources, including compact grants, to support all waste management activities		
	Ongoing collection of data on waste generation and composition, and usage to better inform decision making on solid waste management/ activities		
	Reduce waste going to landfill through application of community composting schemes, banning of plastic bags, wares, and inclusion of new recyclable items into existing program, promotion of alternative source to sand, cobbles		
	Conduct awareness raising activities and programs to address solid waste management objectives		
	Train staff to effectively manage and conduct solid waste management programs and activities		
	Develop collection system and improve landfill		
3.6.3 Develop Waste Water Management Plan	Undertake assessment and develop waste water management plan	SDP	Public Works, KIRMADHS

SECTOR 4: PRIVATE SECTOR			
Objective 4.1: Strengthen communication and partnerships between private sector and government			
Action	Sub Action	Source of Action	Lead and Supporting Agencies
4.1.1 Develop private sector specific communication and awareness raising strategy to contribute to State Wide Communications Strategy	Conduct training on appropriate adaptation measures to address salt water intrusion, coastal shores erosion and invasive species	SDP	Chamber of Commerce
4.1.2 Acquire more climate-tolerant crop varieties from SPC and Land Grant to increase the diversity of locally grown crops for the island	Undertake training of trainers	SDP	DREA, COM, PASAP, Communities
	Undertake community outreach		
	Collection and distribution, planting of materials		
4.1.3 Undertake disaster business continuity planning with the private sector	Develop business continuity plans during and after disasters	JSAP Consultations	DCO and Chamber of Commerce, KIRMA, DREA
4.1.4 Work with state government to extend the 60 days grace period for sales tax following disaster events	Review the State sale tax legislation to accommodate provisions for disaster times	JSAP Consultations	AG Department and Chamber of Commerce, KSL
4.1.5 Consult with the business community to create zoning laws	Introduce zoning concept	JSAP Consultations	KIRMA and Chamber of Commerce, KSL, communities, DREA
	Revisit Land Use Plan		
	Undertake community outreach		
Objective 4.2: Improve private sector risk management through the uptake of appropriate insurance policies			
4.2.1 Work with insurance industry to develop appropriate and feasible insurance policies for businesses in Kosrae	Chamber of commerce to pursue with insurance company for business coverage	JSAP Consultations	Chamber of Commerce, KSLDREA
Objective 4.3: Improve the regulatory environment to support local private sector and encourage appropriate levels of foreign investment			
4.3.1 Encourage bulk ordering for businesses to reduce impacts of potential commercial transport accidents	Feasibility study on additional shipping services to Kosrae	JSAP Consultations	Chamber of Commerce
4.3.2 Review current laws and legislation relating to foreign investment and policies for businesses (e.g. relating to tourism – diving, sailing, surfing)		JSAP Consultations	Chamber of Commerce and AG Department, DREA
4.3.3 Current legislation relating to fisheries improved and enforced	Undertake inventory of all boats	SDP	DREA
	Develop boating registration regulations		
	Undertake capacity building and awareness to relevant stakeholders		

4.3.4 Government to increase support (e.g. incentives) to commercial and trade activities (e.g. fisheries, agriculture, poultry)	Provide incentives for commercial farmers	JSAP Consultations	DREA, Chamber of Commerce
	Undertake business training for commercial farmers		

SECTOR 5: SOCIAL AND CULTURAL			
Objective 5.1: Develop a strategy that considers options for relocation			
Action	Sub Action	Source of Action	Lead and Supporting Agencies
5.1.1 Develop specific communication and awareness raising strategy regarding relocation to contribute to State Wide Communications Strategy	Set time lines	JSAP Consultations	KIRMA, PACC
	Monitoring and coordination		
5.1.2 Consider preparations for relocation to higher ground	Provide resources to those who are vulnerable (money, materials, accessible properties)	JSAP Consultations	DREA, ODA, Office of Planning , PACC, Municipal Offices
	Seek donors for road development (e.g. out of fishing fees)		
	Seek US Housing Development opportunities including rural development (agriculture etc)		
5.1.3 Develop plan to address low income families (i.e. assistance to undertake relocation)	Government to review the possibility of using unused properties (and land) for low income families)	JSAP Consultations	DREA, Land Court
	Private land properties be purchased and allow low income families to use		
	Seek Peace Corps response		
	Train local grant writers		
5.1.4 Looking for grant writers to assist in securing financial and grant support	Seek grant writers through AVI	JSAP Consultations	ODA
	Seek Peace Corps response		
	Train local grant writers		
5.1.5 Policy to promote relocation of settlement from coastal areas developed	Have Kosrae State Leaders, KSL, AG, Mayors to make legislation regarding coastal management	SDP	AG, DCO, KIRMA
5.1.6 Seek government and external support for the resettlement of businesses and communities	Local governments to follow up	JSAP Consultations	DCO, Chamber of Commerce, Mayors
Objective 5.2: Improve and strengthen cultural and traditional practices and knowledge			
5.2.1 Design and implement local skill trainings program to reflect cultural/traditional fishing, farming, family etc	Continue to enhance programs and activities run by social groups (senior citizens, women, youth) and government agencies such as DREA, DOE, Municipals government etc	SDP	DREA, DOE, Tourism, KYDA, Disability Groups
5.2.2 Promote use of local produce/traditional food at homes	DREA to help with agriculture projects	SDP	DREA,DHS
	Land Grant to enhance training		Land Grant
Objective 5.3: Strengthen family and community well-being			

5.3.1 Strengthen the capacity of women and children for climate change adaptation and disaster	Increased knowledge and skills provided to women to assist with first aid, protection of the environment, DRM, CC and natural resource management	SDP	KIRMA, KWA,MRCS
	Domestic Violence Bill L.B 10-20 enacted and implemented	SDP	AG, DHS, KWA
	Conduct leadership, advocacy and management training for women and youth	SDP	DOE, KWA, KYDA
	Women and girls mentored to undertake scholarship and leadership opportunities in Kosrae and regionally	SDP	DOE, KWA, KYDA
5.3.2 Youths capacity is strengthened for climate change adaptation and disaster	Youth organizations legally recognized and incorporated in local and state governments	SDP	KYDA
	Increase and expand fund raising activities at state and community youth organization levels	SDP	KYDA, ODA
	Lobby and support strengthening of education and awareness programs on youth health, social issues and promoting volunteer based activities	SDP	DOE, DHS, KYDA, MRCS
	Expand and strengthen substance use prevention education and awareness programs and/or services	SDP	DOE, DHS, KYDA
	Establish pre-marital counselling requirement for youth	SDP	DHS, Church
	Promote increased community-based unplanned pregnancy, STI education and prevention programs	SDP	DHS, DOE, KWA, KYDA,MRCS
	Encourage parents to spend more time with children and youth to teach them about their own development into adulthood	JSAP Consultations	DOE (PTA), Church, KWA, KSC
	Encourage parents to balance their time in teaching their kids in local language and culture alongside attending social activities	SDP	
	Recognising drug and alcohol use in communities and provision of education and awareness raising (parents/ teachers/ health staff) through workshops, training, brochures and leaflets, one-on-one counselling	JSAP Consultations	DHS, DOE, KYDA
	Provide community awareness/ workshops on skills to help control and manage increasing issues such as NCDs, children's use of drugs, alcohol, excessive TV viewing, cell phone use, internet (pornography, cyber-bullying, inappropriate access)	SDP	DHS, DOE, KYDA, KWA
5.3.3 Capacity for people with disabilities is strengthened for climate change adaptation and disaster	Appoint assistance to disabled individuals in times of disaster	JSAP Consultations	Government? Disability Association
	Provide accessible equipment such as wheelchair/crutches ramps (4)	JSAP Consultations	Government? Disability Association
	Build dedicated central facility for the disability community	JSAP Consultations	Government? Disability Association

SECTOR 6: INFRASTRUCTURE			
Objective 6.1: Review existing building codes and improve awareness of appropriate standards for all infrastructure			
Action	Sub Action	Source of Action	Lead and Supporting Agencies
6.1.1 Develop communication and awareness raising strategy on building and infrastructure standards to contribute to State Wide Communications Strategy	Undertake public awareness programs	JSAP Consultations	DT&I, DCO
	Assess legislation		
6.1.2 Assess and strengthen building code	Assess Building Codes relating to Energy Efficiency and Appliances	SDP	DT&I, DCO
	Identify areas where code would be implemented: buildings (structure, electrical, mechanical, plumbing, fire protection, solar installation in building and connection to grid)		
	Develop standards and regulations		
	Undertake public awareness programs		
	Submit endorsement of regulations to leadership		
	Implement the regulations		
6.1.3 Publish standards for climate resilient roads	Coordinate with PACC for documents	JSAP Consultations	PACC Project, DT&I
	Identify sites/Municipality roads		
	Reference will be the completed PACC climate proof road plan at Okat		
	Implement and publish the standards		
6.1.4 Engineering design of infrastructure and housing mainstream disaster and climate risk considerations and adaptation	Assess current data and standards for building and infrastructure	SDP	DT&I, DCO, PACC
	Secure new information and standards on climate proof buildings, roads and facilities		
Objective 6.2: Strengthen technical and policy capacity to address infrastructure issues in Kosrae			
6.2.1 Capacity building for personnel	Technical and specialised trade trainings undertaken	JSAP Consultations	DT&I, DCO
	Training on new technical practices and technology		
	Additional skilled manpower		
	Additional equipment and tools		
	Training on disasters and climate change		
6.2.2 Identify funding opportunities from loans and grants (e.g. RUS, World Bank, ADB, EU, JICA, China and other development partners)	Ongoing activity with KSG, ODA, KUA	JSAP Consultations	DT&I, KUA
6.2.3 Consider establishment of additional taxed to raise revenue for infrastructure projects (e.g. green tax, airport tax, road tax)	Public consultations – state and national legislation, environmental group consultation and implementation	JSAP Consultations	DT&I, KUA, FSM government, KSG legislature, PACC
6.2.4 Begin discussions with national government (DT&I) regarding co-funding of infrastructure upgrades		JSAP Consultations	DT&I, KUA

Objective 6.3: Improve critical infrastructure in Kosrae to withstand disasters and climate change			
6.3.1 Assess and upgrade critical infrastructure (roads, water, utilities, telecom) to withstand disasters and climate change	Inspections and assessments of facilities	JSAP Consultations	DT&I, DCO
	Implement upgrade plans		
6.3.2 Undertake pole hardening	Secure funding	JSAP Consultations	DT&I, KUA
	Procure materials, implement plan		
6.3.3 Review options for Kosrae terminal upgrading and maintenance	Verify status with DT&I	SDP	DT&I, KUA
	Build sea wall at airport area, elevate runway, develop pumping system	JSAP Consultations	DT&I, KUA
	Identify funding		
6.3.4 Connect inland roads to improve access	Undertake assessment for inland roads and develop plan	JSAP Consultations	DT&I, KUA
	Assess costs involved for connecting inland roads	JSAP Consultations	DT&I, KUA
	Consider options to develop alternate road (cross island road)	JSAP Consultations	DT&I, KUA
6.3.5 Consider options for relocation of Infrastructure, utilities, and improvement of Access Roads etc.	Undertake assessment for inland roads and develop plan	SDP	DT&I, KUA, PACC
	Assess costs involved for connecting inland roads		
	Consider options to develop alternate road (cross island road)		
6.3.6 Ensure schools & other structures identified as shelters are certified and upgraded as needed (for typhoon)	Inspections and assessments of facilities	JSAP Consultations	DT&I, DoEd
	Secure funding, construction		
6.3.7 Assess viability for public transportation system	Conduct a study and consultation with citizens	JSAP Consultations	DT&I
	Implement new system		
Objective 6.4: Improve drainage at key locations			
6.4.1 Maintain/develop proper drainage at key locations	Assess drainage at hospital (lack of supporting walls; inappropriate landscaping) and upgrade as appropriate	JSAP Consultations	DT&I, Municipalities
6.4.2 Assess and upgrade facilities to ensure safe and environmentally protective sewage (public and private)	Sewage system assessment	JSAP Consultations	KIRMA, DT&I, KUA
	Attain 2 septic pump truck		
Objective 6.5: Improve communications capacity			
6.5.1 Upgrade broadcasting facilities	Consider options for relocation of the station to higher ground	JSAP Consultations	KSG
	Install emergency power backup	JSAP Consultations	
6.5.2 Upgrade telephone and internet system - Fibre optics - Underground cables - 3 satellite system - Tools and equipment		JSAP Consultations	KSG, FSM Government, Telecom

Objective 6.6: Review options for alternate energy sources			
6.6.1 Increase the use of renewable energy (solar, wave, wind, hydro)	Assess alternate energy sources (solar, wave, wind, biogas etc) – ongoing study	JSAP Consultations	KUA
6.6.2 Assess options for waste to energy systems (waste oil etc)	Identify most applicable design from existing proposals	JSAP Consultations	KUA
6.6.3 Develop alternate fuel depot	Develop MOU between KUA and PetroCorp to use KUA fuel storage as stand by fuel farm	JSAP Consultations	KUA
6.6.4 Pre-electrification of Walung Village using lighting kits and offgrid solar systems for school and dispensary	Ongoing project with funding from SPC	SDP	KUA
6.6.5 Reduction of fuel usage in production of power through increased usage of Solar PV system and ultimately doubling the capacity of the grid connected PV system	Approved projects with funding from EU and Japan's PEC fund	SDP	KUA
Objective 6.7: Strengthen the efficiency and effectiveness of existing energy sources			
6.7.1 Upgrade power plants and substations (Lelu Island, Okat U/G)	Projects submitted for funding from World Bank, Japan (JICA) – request for $2M	JSAP Consultations	KUA
6.7.2 Replace one inoperative back up unit with the new	Projects submitted for funding from World Bank, Japan (JICA) – request for $2M	SDP	KUA
6.7.3 Generator of higher efficiency. Work with supplier for the most suitable unit for Kosrae	Projects submitted for funding from World Bank, Japan (JICA) – request for $2M	SDP	KUA
6.7.4 Prepare the existing diesel grid for a maximum penetration of renewable energy sources	Project approved with funding from PIGGAREP/SPREP	SDP	KUA
6.7.5 Conduct grid stability and study on smart substations with short term storage that will lead to optimizing and synchronizing the diesel generator with renewable energy sources	Project approved with funding from PIGGAREP/SPREP	SDP	KUA
6.7.6 Conduct Energy Awareness Programs to general public and government so that they will use the electricity wisely and conserve battery in the stand alone PV systems	Ongoing activity	SDP	KUA, KIRMA
Objective 6.8: Strengthen management of freshwater resources			
6.8.1 Assess storage and purification of water in communities	Improve treated water systems at all communities	JSAP Consultations	KUA, DT&I, municipal government
	Install simple water treatment system in the community water supply system	JSAP Consultations	KUA, DT&I, municipal government
6.8.2 Enhance Disaster-Proof Water Supplies	Elevate household water tanks	JSAP Consultations	KUA, DT&I, municipal government
	Inspection of water dams		
	Improvement of dam structure protections		

6.8.3 New dam in Mosral (laying pipes now)	Improvement and upgrading	JSAP Consultations	KUA, DT&I, Malem Municipality
6.8.4 New dam in Yeseng (looking for funds)	Improvement and upgrading	JSAP Consultations	KUA, DT&I, Malem Municipality
6.8.5 Construct a separate water supply line for the hospital water supply		JSAP Consultations	KUA, DT&I, DoH
6.8.6 Install water filtration system at the hospital	To be included in the new hospital construction	JSAP Consultations	KUA, DT&I, DoH
6.8.7 Provide safe and adequate running water in all education facilities	Secure funds Install individual filter system to school	JSAP Consultations	KUA, DT&I, DoEd, DOH

COSTING ESTIMATES

Costing estimates for activities are provided below. Costs include both financial and in-kind contributions for each of the six sectors.

Table 10: Cost estimates for Kosrae's JSAP.

Costing Estimates		
Sector 1: Health		
Objective		Total Costs (Financial and In-kind)
1.1	Strengthen policy and technical capacity of the health sector in Kosrae	$320,565
1.2	Strengthen and support the use of local traditional medicine	$45,331
1.3	Raise the level of public education and technical awareness about health-related risks and the links to climate change and disasters	$101,162
Sector 1: Health OVERALL TOTAL		**$467,057**
Sector 2: Education		
2.1	Develop and implement an ongoing climate change and DRM education and awareness program through the formal education system	$334,864
2.2	Develop and implement an ongoing climate change and DRM education and awareness program for communities	$43,123
Sector 2: Education OVERALL TOTAL		**$377,987**
Sector 3: Environment		
3.1	Improve coordination on disaster risk management and climate change adaptation	$3,115
3.2	Strengthen climate and disaster risk preparedness and response capacity	$269,322
3.3	Reinstate Fire Department	$20,405
3.4	Strengthen policy and technical capacity for Shoreline Management to enhance resilience and reduce vulnerability to climate change and natural hazards	$169,907
3.5	Strengthen policy and technical capacity, and community awareness of invasive species	$32,442
3.6	Address and improve management of solid waste	$447,852
Sector 3: Environment OVERALL TOTAL		**$943,044**
Sector 4: Private Sector		
4.1	Strengthen communication and partnerships between private sector and government	$56,792
4.2	Improve private sector risk management through the uptake of appropriate insurance policies	$0
4.3	Improve the regulatory environment to support local private sector and encourage appropriate levels of foreign investment	$545,855
Sector 4: Private Sector OVERALL TOTAL		**$602,647**

Sector 5: Social and Culture		
5.1	Develop a strategy that considers options for relocation	$161,928
5.2	Improve and strengthen cultural and traditional practices and knowledge	$0
5.3	Strengthen family and community well-being	$81,220
Sector 5: Social and Culture OVERALL TOTAL		$243,148
Sector 6: Infrastructure		
6.1	Review existing building codes and improve awareness of appropriate standards for all infrastructure	$96,697
6.2	Strengthen technical and policy capacity to address infrastructure issues in Kosrae	$104,648
6.3	Improve critical infrastructure in Kosrae to withstand disasters and climate change	$501,390
6.4	Improve drainage at key locations	$156,900
6.5	Improve communications capacity	$30,000
6.6	Review options for alternate energy sources	$0
6.7	Strengthen the efficiency and effectiveness of existing energy sources	$0
6.8	Strengthen management of freshwater resources	$289,846
Sector 6: Infrastructure OVERALL TOTAL		$1,179,480
Total cost (financial and in-kind)		$3,813,364

A summary of costs is provided in the Table below.

Table 11: Summary of JSAP costs

Cost Summary	
Sector	Total Costs
1. Health	$467,057
2. Education	$377,987
3. Environment	$943,044
4. Private Sector	$602,647
5. Social & Culture	$243,148
6. Infrastructure	$1,179,480
OVERALL TOTAL COSTS	$3,813,364

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APPENDICES

APPENDIX A: KEY DOCUMENTS CONSULTED

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URS (2005) Multi-state multi-hazard mitigation plan for the Federated States of Micronesia. Prepared for National Emergency Management Office, Pohnpei. URS Project No. 27654135.00500, September 2005.

United Nations Development Program Global Environment Facility (2006) Pacific Adaptation to Climate Change: Federated States of Micronesia, Kosrae State. Report of In-Country Consultations.

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APPENDIX B: SUMMARY OF POTENTIAL HAZARD-RELATED EXPOSURE IN KOSRAE STATE

This table is taken from FSM's Multi-State Multi-Hazard Mitigation Plan (URS, 2005)

		Residential		Commercial		Critical Facilities	
Hazard Type	Exposed Population	Number of Residential Buildings	Potential Exposure for Residential Buildings (x $1,000)	Number of Commercial Buildings	Potential Exposure for Commercial Buildings (x $1,000)	Number of Critical Facilities	Potential Exposure for Critical Facilities (x $1,000)
Coastal Erosion/Rising Sea Level/Storm Surge/ Tsunami	6,149[8]	2,021[9]	12,126[3]	81[10]	12,150[5]	79[11]	356,535[7]
Dam Failure*	7,686	1,087	6,522	24	3,600	88	396,150
Drought/Extreme Heat*	7,686	1,087	N/A	24	N/A	88	N/A
Earthquake*	7,686	1,087	6,522	24	3,600	88	396,150
Epidemic*	7,686	1,087	N/A	24	N/A	88	N/A
Flood	6,149[8]	2,021[9]	12,126[3]	81[10]	12,150[5]	79[11]	356,535[7]
Rain-Induced Landslide	6,149[8]	2,021[9]	12,126[3]	81[10]	12,150[5]	79[11]	356,535[7]
Tropical Cyclone	6,149[1]	978[2]	5,868[3]	81[4]	12,150[5]	79[6]	356,535[7]
Wildfire*	7,686	1,087	6,522	24	3,600	88	396,150
Man-made Hazard*	7,686	1,087	6,522	24	3,600	88	396,150

* *Estimates are based upon total exposure since no detailed information is available at the time of this Plan.*

[1] *Represents 80 percent of population (average number of people affected by Typhoon Sudal).*

[2] *Represents 90 percent of residential buildings (average number of residences affected by Typhoon Sudal).*

[3] *Represents average value of $6,000 per residence.*

[4] *Represents 90 percent of commercial buildings (average number affected by Typhoon Sudal).*

[5] *Represents average value of $150,000 per commercial building.*

[6] *Represents 90 percent of critical facilities (average number affected by Typhoon Sudal).*

[7] *Represents 90 percent of total critical facilities (total estimated at $396,150).*

[8] *Represents Represents 80 percent of population (approximation based upon coastal/storm surge/flood areas).*

[9] *Represents 90 percent of residential buildings (approximation based upon coastal/storm surge/flood areas).*

[10] *Represents 90 percent of commercial buildings (approximation based upon coastal/storm surge/flood areas). 11Represents 90 percent of critical facilities (approximation based upon coastal/storm surge/flood areas).*

Source: URS (2005).

APPENDIX C: DISASTER-RELATED ROLES AND RESPONSIBILITIES FOR KOSRAE

Table 12: Disaster-related roles and responsibilities for Kosrae

Organization/ Person	Roles and responsibilities
Governor	• Declare a state of emergency if needed • Designation of a state DCO • Designation of a command post • Designation of shelters • Declaration of various states of warning • Mobilization of the emergency task forces and initiation of necessary property and life-saving measures, evacuations, mass care, etc • Initiation of damage assessment as soon as feasible when a disaster occurs and communication to the FSM President when national and/or US FEMA or other foreign assistance is needed • Designation of a representative to work with NEMO who is the FSM point of contact on all disaster-related matters • Designation of a disaster application center and a disaster field office
State DCO	• Maintaining and updating the State Preparedness Plan • Developing public awareness and training programs in cooperation with other State departments and agencies • Coordinating the State sponsored training and public awareness programs with appropriate department and agency heads • Preparation of requests for disaster or mitigation assistance to the National government, or through the National government to foreign governments or other international organizations or agencies • Ensuring that warnings are issued to the public when the Governor declares different warning stages • Performing all other emergency coordination functions that may be necessary given the demands of the given disaster or emergency situation
Emergency Operations Center/Command Post	• Provides a point of centralized control, coordination and direction of emergency operations • Serves as a place for key staff to effectively work together, share information and decision-making, and assists in making the most effective use of resources • Staff report to the command post after a disaster has occurred or when the Governor declares that a treat has been identified