

**Annex 3: Revised proposal document with tracked changes addressing comments made by the secretariat in its initial review**



**ADAPTATION FUND**

**REQUEST FOR PROJECT/PROGRAMME  
FUNDING FROM THE ADAPTATION FUND**

The annexed form should be completed and transmitted to the Adaptation Fund Board Secretariat by email or fax.

Please type in the responses using the template provided. The instructions attached to the form provide guidance to filling out the template.

Please note that a project/programme must be fully prepared (i.e., fully appraised for feasibility) when the request is submitted. The final project/programme document resulting from the appraisal process should be attached to this request for funding.

Complete documentation should be sent to:

The Adaptation Fund Board Secretariat  
1818 H Street NW  
MSN P4-400  
Washington, D.C., 20433  
U.S.A  
Fax: +1 (202) 522-3240/5  
Email: [afbsec@adaptation-fund.org](mailto:afbsec@adaptation-fund.org)

# 1. CONTENTS

<b><u>Contents</u></b> .....	<b>11</b>
<b><u>PART I: PROJECT INFORMATION</u></b> .....	<b>14</b>
<u>Project / Programme Background and Context:</u> .....	15
<u>National and Local Level Context</u> .....	15
<u>Geography and Climate</u> .....	15
<u>Political and Legislative</u> .....	17
<u>Institutional Arrangements for Climate Change</u> .....	18
<u>Demography</u> .....	19
<u>Economy</u> .....	19
<u>Water Security Problems in Outer Islands</u> .....	20
<u>Proposed Focus Area</u> .....	22
<u>Yap State</u> .....	22
<u>Chuuk State</u> .....	22
<u>Pohnpei State</u> .....	23
<u>Kosrae State</u> .....	23
<u>Climate Change Impacts and Risks</u> .....	24
<u>Sea Level and Extreme High Tides</u> .....	25
<u>Rainfall</u> .....	26
<u>Vulnerability Assessment</u> .....	27
<u>National Level Response to Vulnerability</u> .....	29
<u>Water and Sanitation</u> .....	31
<u>The Significance of Local Decision-Making to Water Security Adaptation in FSM</u> .....	31
<u>Existing Resilient Practices in Water Security</u> .....	31
<u>Existing Resilient Practices in Coastal Management</u> .....	33
<u>Project / Programme Objectives:</u> .....	34
<u>Project Components and Financing:</u> .....	35
<b><u>PART II: PROJECT JUSTIFICATION</u></b> .....	<b>36</b>
A. <u>Project Components and Activities</u> .....	36
<u>Component 1: Strengthening policy and institutional capacity for integrated coastal and water management at national, state levels and outer islands</u> .....	36

<a href="#"><u>Activity 1.1.1: Review of National-level legislation and policies for (i) infrastructure to identify climate change requirements; and (ii) regulatory and policy framework for climate change</u></a>	37
<a href="#"><u>Activity 1.1.2: Develop guidance based on recommendations from the review of coastal and marine management legislation and policy and monitor progress of recommendations uptake through relevant Departments</u></a>	37
<a href="#"><u>Activity 1.2.1: Review of State-level legislation and policies for infrastructure to identify climate change requirements</u></a>	37
<a href="#"><u>Activity 1.2.2: Develop guidance based on recommendations from the review of coastal and marine management legislation and policy and monitor progress of recommendation uptake through relevant Departments</u></a>	38
<a href="#"><u>Activity 1.3.1: Support the implementation of State-level Water Outlook and Investment Plans</u></a>	38
<a href="#"><u>Component 2: Demonstration of water security and sanitation measures in outer islands of Yap, Chuuk and Pohnpei</u></a>	39
<a href="#"><u>Activity 2.1.1: Arrangements for demonstrations of water technologies</u></a>	40
<a href="#"><u>Activity 2.1.2: Carry out ground-truthing assessments</u></a>	41
<a href="#"><u>Activity 2.2.2: Repairing household rainwater harvesting and storage systems</u></a>	42
<a href="#"><u>Activity 2.2.3: Constructing community rainwater harvesting and storage systems</u></a>	44
<a href="#"><u>Activity 2.2.4: Implementation of a monitoring and maintenance programme</u></a>	44
<a href="#"><u>Activity 2.3.1: Sanitation measures assessed and piloted in outer islands in Yap, Chuuk and Pohnpei</u></a>	45
<a href="#"><u>Component 3. Demonstration of adaptation measures for coastal communities in Kosrae State</u></a>	46
<a href="#"><u>Activity 3.1.1: Survey and design road and related infrastructure to ensure climate change resilience</u></a>	46
<a href="#"><u>Activity 3.2.1: Coastal protection works</u></a>	49
<a href="#"><u>Component 4: Knowledge management for improved water and coastal protection</u></a>	52
<a href="#"><u>Activity 4.1.1: Undertake knowledge management, communication, and engagement activities</u></a>	52
<a href="#"><u>Activity 4.1.2. Capture and document data and information generated by the project</u></a>	53
<a href="#"><u>B. Social, Economic, and Environmental benefits</u></a>	54
<a href="#"><u>C. Cost-effectiveness of the Proposed Project</u></a>	62
<a href="#"><u>D. Consistency with National Strategies</u></a>	73
<a href="#"><u>E. Technical Standards</u></a>	76
<a href="#"><u>F. Project Duplication</u></a>	79

<a href="#">G. Learning and Knowledge Management</a>	79
<a href="#">H. Stakeholder Consultative Process</a>	81
<a href="#">I. Justification for Funding Request</a>	86
<a href="#">J. Sustainability</a>	92
<a href="#">K. Environmental and Social Impacts and Risks</a>	94
<b><a href="#">PART III: IMPLEMENTATION ARRANGEMENTS</a></b>	<b>100</b>
<a href="#">A. Institutional Arrangements</a>	100
<a href="#">Project Implementing Agency</a>	100
<a href="#">Project Executing Agency</a>	100
<a href="#">Project Management Unit</a>	100
<a href="#">Governance Structure</a>	103
<a href="#">Project Board</a>	103
<a href="#">B. Financial and Project Risk Management</a>	104
<a href="#">C. Environmental and Social Risk Management</a>	109
<a href="#">D. Monitoring and Evaluation Arrangements</a>	111
<a href="#">E. Project Results Framework</a>	114
<a href="#">F. Alignment with the Results Framework of the Adaptation Fund</a>	127
<a href="#">G. Project Budget</a>	133
<a href="#">H. Disbursement Schedule</a>	139
<a href="#">FSM Endorsement Letter</a>	<b>Error! Bookmark not defined.</b>
<a href="#">Kosrae State Endorsement Letter</a>	<b>Error! Bookmark not defined.</b>
<a href="#">Annex A. FSM land ownership</a>	141
<a href="#">Annex B. Environmental and Social Management Plan</a>	143
<a href="#">Annex C. Complementary programmes and projects</a>	111
<a href="#">Annex D. Implementation Phase: key outcomes from stakeholder consultations</a>	117
<a href="#">Annex E. Planning Phase: key meetings and findings</a>	118



## ADAPTATION FUND

# PROJECT PROPOSAL TO THE ADAPTATION FUND

## 2. PART I: PROJECT INFORMATION

<b>Project/Programme Category:</b>	Regular Project
<b>Country/ies:</b>	Federated States of Micronesia (FSM)
<b>Title of Project/Programme:</b>	Enhancing the climate change resilience of vulnerable island communities in the Federated States of Micronesia (FSM)
<b>Type of Implementing Entity:</b>	Regional Implementing Entity
<b>Implementing Entity:</b>	Secretariat of the Pacific Regional Environment Programme (SPREP)
<b>Executing Entity/ies:</b>	Department of Environment, Climate Change & Emergency Management (DECEM)
<b>Amount of Financing Requested:</b>	US\$9,000,000

# Project / Programme Background and Context

## National and Local Level Context

### Geography and Climate

The Federated States of Micronesia (FSM) is located near the equator about 4,000 km southwest of the Hawaiian Islands in the Western Pacific Ocean and within the Caroline Islands group. It is a group of 647 islands (84 of the islands are inhabited) covering 2,736 square kilometres (km<sup>2</sup>) in the western Pacific Ocean (Figure 1). The land area totals 704.6 km<sup>2</sup>, with 7,192 km<sup>2</sup> of lagoon area. The islands vary from small islets inundated at high tide to atolls and large volcanic islands with a land area larger than 80 km<sup>2</sup>. FSM's physical isolation, as well as the distance between States, and between islands within States, combined with limitations in transport, pose multiple development challenges.

The FSM is located north of Papua New Guinea, south of Guam, and east of the Philippines, has an exclusive economic zone covering approximately 2,589,998 km<sup>2</sup> (1,000,000 sq. mi). Four types of island occur: (1) volcanic high islands, which can be highly rugged in their basalt interiors and are typically surrounded by fringing or barrier reefs; (2) low lying atolls; (3) raised coral islands; and (4) low coral islands. Low lying atoll and coral outer islands are especially isolated and require significant effort to reach from the main islands by boat or small plane. The coral fringing and barrier reefs that surround each island are of great biological significance.

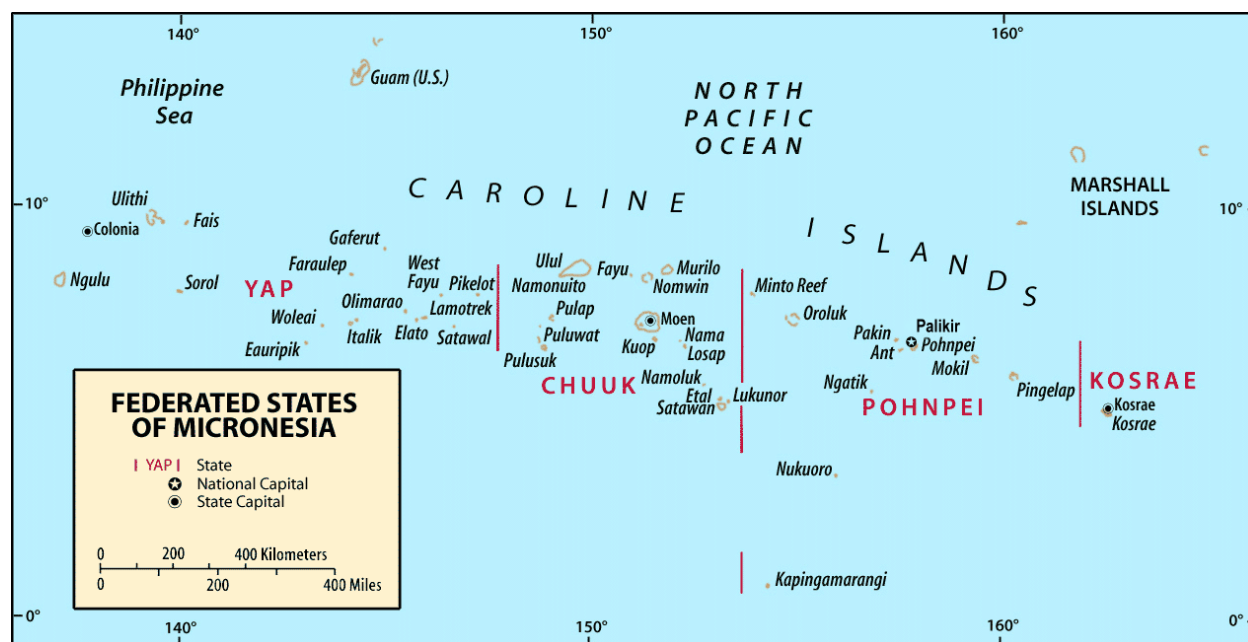


Figure 1. Map of the Federated States of Micronesia<sup>1</sup>

Each of the four States is centred on one or more main high islands (Table 1). All but Kosrae State include numerous outlying atolls. The capital of FSM, Palikir, is in Pohnpei State. Many of the islands in FSM are extinct shield volcanoes with steep, rugged centres that are densely vegetated and eroded. Mangroves grow around the coastal fringes. Land elevations range up to

<sup>1</sup> By U.S. Central Intelligence Agency - Federated States of Micronesia (Political) 1999 from Perry-Castañeda Library Map Collection: Federated States of Micronesia Maps, Public Domain, <https://commons.wikimedia.org/w/index.php?curid=46492>

approximately 760 metres (2,500 feet). Other islands are relatively flat, small and swampy, with low-lying, forested atoll islets, typically 1-5 metres above mean sea level<sup>2</sup>.

The major vegetation types in the FSM are native upland forest, agroforest, mangrove forest and savanna, other shrubs and grasslands. About a third of FSM's land area is suitable for agriculture, but less than 5 percent of agricultural land is arable. About half of the agricultural land is used for permanent crops, with the remainder used for other agricultural purposes.

**Table 1. Geography of FSM's four states<sup>3</sup>**

State	No. of Island Groups	No. Islands	No. Inhabited Islands	Topography (HV, A)*	Land area (km <sup>2</sup> )	Lagoon Area (km <sup>2</sup> )	Popn. (2010)	Popn Density* <sup>*</sup>
Yap	12	78	22	HV + A	119	1049	11,377	247
Chuuk	7	542	55	HV + A	127	2132	48,654	990
Pohnpei	6	26	6	HV + A	342	769	36,196	274
Kosrae	1	1	1	HV	117	0	6,616	146
Total	26	647	84		705	3,950	102,843	378

(\* HV = high volcanic; A = atolls, \*\*individuals per square kilometre)

The tropical climate of FSM is due to its geographical location in the Western Pacific, just north of the equator, and the strong influence of northeast trade winds, which generates consistently warm temperatures. The trade winds prevail from December through April. Periods of weaker winds and doldrums occur from May to November. Rainfall is generally plentiful, especially on the high volcanic islands of Kosrae, Pohnpei and Chuuk. The region is affected by storms and typhoons that are generally more severe in the western islands, as well as by periods of drought and excessive rainfall associated with different phases of the El Niño – Southern Oscillation (ENSO).

From May to November the rainfall is extremely high on the volcanic islands of Kosrae, Pohnpei and Chuuk. Yap lies in an area that generally experiences a monsoonal climatic pattern, with more frequent periods of drought. The climate of Chuuk is hot and humid with an average temperature of 27°C (81°F), and little variation throughout the year. Average annual precipitation is 3,100 mm (122 inches), with the months of January to March being drier. Pohnpei is generally hot and humid, with a mean temperature of 27°C (81°F). Temperatures vary little from month to month. The mean annual rainfall is 4,826 mm (190 inches), with January and February being slightly drier than the average of all months.

Kosrae's climate is characterized by high temperatures, heavy rainfall, and high humidity. The average annual rainfall measured at the weather station in coastal Lelu is 5,000mm (203 in). In the mountainous interior, rainfall is estimated to be as high as 7,500mm (300 in) annually. Average temperature is again 27°C (81°F) at sea level. Average monthly temperatures vary from the

<sup>2</sup> FSM, 2015, Second National Communication under the UN Framework Convention on Climate Change

<sup>3</sup> Namakin, 2008; FSM Division of Statistics, 2012 *in* FSM, 2015, Second National Communication under the UN Framework Convention on Climate Change, p.16)

annual average by no more than 1°C (0.5°F), and the difference between the average minimum and maximum temperatures is less than 8°C (14°F).

## **Political and Legislative**

Since its inception in 1979, when it formed its own constitutional government, FSM has worked with the United States Government to achieve self-sufficiency through its primary source of assistance, the Compact of Free Association (1986-2003) and the subsequent Compact II (2004-2023).

The country's government is modelled after the federal system of the United States with a national president and four state governors with respective legislatures and judiciaries. The Government has four levels of governance – national, state, municipal, and traditional.

The four states – Chuuk, Kosrae, Pohnpei and Yap – where the project is to be implemented, have a considerable degree of autonomy. Each State Government has its own constitutional Government, consisting of the Executive, Legislative and Judicial branches.

Each FSM State has its own set of environmental laws and regulations recognizing the impacts of climate change and the need for adaptation measures. Under the Compact II, Article VI Section 161 of Title II, FSM is committed to applying the National Environmental Policy Act of 1969 and “to develop and implement standards and procedures to protect its environment”.

In June 2012, the FSM Environmental Protection Act became Public Law. Its purpose is to:

- Reflect the current functions and responsibilities of the National Government in the area of environmental management and protection;
- Eliminate duplication of responsibilities between the National and State Governments in relation to environmental management and protection; and
- Provide the Office of Environment and Emergency Management (now Department of Environment, Climate Change and Emergency Management (DECEM)) with the necessary legal authority to implement, via regulation, the multilateral environmental agreements that FSM has already ratified, including the United Nations Framework Convention on Climate Change (UNFCCC).

This project will build on the existing legislative and policy framework that the National Government and the State of Kosrae have already put in place.

The FSM Environment Sector Plan 2010-2015, prepared in accordance with the FSM Strategic Development Plan (SDP) 2004-2023, identifies achieving higher rates of compliance with environmental laws as a high priority for FSM national and state governments. Among the most serious problems of environmental governance in FSM is that the laws and regulations are not enforced consistently or effectively. The 2012 Environment Protection Act endeavours to address this and related issues, in part by strengthening enforcement action and by requiring the Secretary of DECEM to provide, on an annual basis, an environmental quality report covering the status and conditions of the environment of FSM, and a review of the programmes and activities of the National Government, State governments, municipal governments and nongovernmental organizations (NGOs), with particular reference to their effect on the national environment.

The FSM Government has put in place national frameworks for adaptation. The Strategic Development Plan (SDP) 2004-2023 and the Infrastructure Development Plan (IDP) 2016-2025 are based on several frameworks which provide mitigation and adaptation measures to limit the

impacts of climate change. The SDP for FSM provides a roadmap for social and economic development for 20 years (2004-2023).

Multiple mitigation and adaptation activities are ongoing at the government and agency levels. FSM adopted national policies on climate change (2009) and Disaster Risk Management and Climate Change Adaptation (2013). Kosrae State, in adopting a Shoreline Management Plan in 2014, became the first state to develop a strategic plan that addresses coastal zone management in view of the adverse impacts of climate change.

The Kosrae Shoreline Management Plan (2014) states: “*much development on Kosrae over the last two to three generations has occurred in low-lying coastal areas...many of the approaches we currently use...will be increasingly ineffective or unaffordable as sea levels rise. It will involve thinking differently than we have done in the past, particularly concerning where we locate infrastructure, our communities and our homes*”.

There is an immediate need for capacity to support adaptation at the national level, and specific legislation, regulation and policy frameworks in the other three States to ensure delivery of effective climate resilient measures for greater protection of people and assets in the coastal zones.

### **Institutional Arrangements for Climate Change**

FSM has ratified or implemented a number of protocols and plans including:

- Ratification of the UNFCCC, Kyoto Protocol and Montreal Protocol (also known as the ozone treaty).
- Signing of the Paris Agreement (2016).
- Awarded a Climate Protection Award (2009) from the U.S. Environmental Protection Agency for contributions to climate protection under the ozone treaty.
- Development of a Multi-State Hazard Mitigation Plan (2005).
- Adoption of a nationwide Climate Change Policy (2009) focusing upon climate change mitigation particularly at the international level, and adaptation at the national, state and community levels to reduce FSM’s vulnerability to climate change impacts. The Policy outlines the integration of climate change into the Strategic Development Plan/Infrastructure Development Plan (SDP/IDP) and into other policies, strategies, and action plans, including disaster preparedness and mitigation. DECEM is designated as the focal point for all government climate change activities by law under Title 25 of the FSM Environmental Protection Authority Act.
- Development of a joint policy for climate change adaptation and disaster risk management.<sup>4</sup>
- Development of a Framework National Water and Sanitation Policy for FSM (2011). The framework provides the rationale and direction for a Comprehensive National Water and Sanitation Policy for FSM. Key elements of the comprehensive policy include a “Federated States of Micronesia National Water Outlook” and “Water Sector Investment Plan”. The intent of this policy is to mainstream the principles of integrated water resource management and water use efficiency into national and state development planning and resource management.
- Integration of initiatives from a common institutional platform for disaster risk reduction and climate change adaptation overseen by the DECEM.

---

<sup>4</sup> GCCA: PSIS. 2013. Climate Change Profile. Federated States of Micronesia. Version 2, July 2013.

## Demography

The population of FSM reached 102,843 at the last census undertaken in 2010. The Census highlighted a decline in population from the 2000 Census figures of 107,008. The decline in population reflects a corresponding decline in population growth in FSM over the past three decades. At the national level, annual growth dropped from 3.0 percent in the 1980-89 period, to minus 0.4 percent over the 2000-2010 period. At the state level, Chuuk and Kosrae have negative growth while in Pohnpei and Yap the rate of growth is still positive but very low at 0.4 and 0.1 percent, respectively. While declining fertility has contributed to the drop in the population growth rate, out-migration to the United States and other parts of Micronesia is the primary cause of negative growth.

**Table 2. Population and household distribution of FSM<sup>5</sup>**

State	Percentage of total FSM Population	Percentage of total number of FSM HH
Yap	11.1	13.8
Chuuk	47.3	41.9
Pohnpei	35.2	37.5
Kosrae	6.4	6.8

The population of the FSM is unevenly distributed between States in terms of total numbers and per sq. km (Table 2). Chuuk State represents 47% of the population, Kosrae 6%, Pohnpei 35% and Yap 11%. The population is young, with 36% between 0 and 14 years, 59% 15-59 years and 5.5 percent 60 or older, though the average age is increasing. There are 4% fewer women of child-bearing age in the FSM today than 10 years ago and the population is declining for the first time in recent history. This demographic change has been influenced by a Compact between the FSM and U.S. The Compact transfers significant funds to the FSM and promotes outmigration by allowing FSM citizens to go to the U.S. and join its military. In return, it supports the U.S. strategic regional Asian and Pacific military considerations. On high islands, a mariner culture and the rough interior have concentrated populations along the coasts<sup>6</sup>.

## Economy

The national and state governments account for over half of the nation's employment and 38% of its GDP. Agriculture is primarily subsistence farming. Natural resources available for economic purposes are limited to timber, marine products, deep-seabed minerals, and phosphate. Commercial fishing is an important source of revenue through licensing fees and export of fish. A wide range of financial and project assistance has been provided through a variety of governments, international institutions, and NGOs, resulting in limited success in developing an integrated, self-supporting, and sustainable economy.

In the Compact II era (2004-2023), FSM is at a critical point in its development. In a relatively short time frame, each FSM State is challenged not only to continue developing a self-sufficient economy, but also to modernize without sacrificing valued cultural traditions and natural resource

---

<sup>5</sup> Smith, W.J., J Mount, D. Bennet and P. Shed. 2014. Collaborative research methodologies and the construction of a national geospatial clearinghouse to conserve biodiversity in the Federated States of Micronesia. *Applied Geography* 54:198-208.

<sup>6</sup> Ibid.

assets. Geographical isolation and poorly developed infrastructure are major impediments to FSM's long-term growth. Over the years, agriculture's socio-cultural role as a safety net for the disadvantaged has greatly diminished. Inequality of income and the incidence of families with incomes below the poverty line are among the highest in the Pacific region. Poverty is a concern and FSM made only limited progress towards achieving the Millennium Development Goals (MDGs) by 2015.

The mainstays of the FSM economy are subsistence farming and fishing. There is limited tourism due to a lack of access and facilities, although it has increased in recent years with small hotels opening in Pohnpei, Yap and Kosrae.

The public sector plays a central role in the economy, as the national and state level governments employ over half of the country's workers and government services and public enterprises account for 38% of GDP. Since the 1995 Economic Summit, the private sector has been a focus of economic development. There are now 22 private locally owned construction companies that also undertake road maintenance.

Daily life in most of the FSM is run on an extended family scale, with village or island functions integrated into this routine. National and state levels of government lack a sustained influence in this routine in most islands. Thus, conservation efforts must connect to the local scale and people with traditional ties into communities if they are to be sustained. The human and physical geography that define the FSM make this a major challenge. Conversely, it is undeniable that given the relative autonomy of islands and villages and the mobile and common nature of many marine resources such as sea turtles and fish, that large-scale planning may need to span "ecoregions"<sup>7</sup>.

### **Water Security Problems in Outer Islands**

Areas of small island countries, such as the FSM, exceed 5,000 mm of precipitation annually. These communities are in some of the wettest places on earth. Nevertheless, their geologic and geographic settings, technology, government capacity, village-scale governance and knowledge base can still make accessing safe drinking water exceedingly difficult. Despite billions of dollars in aid, labour, and local spending, inadequate progress has been made in recent years in many of the less wealthy communities in improving access to safe drinking water<sup>8</sup>.

Despite high national precipitation rates, water supplies on smaller, low-lying atoll islands are extremely vulnerable to droughts and to saltwater inundation caused by high tides. Water for drinking and other uses comes from two sources: rainwater catchments and shallow wells that draw from a layer or "lens" of freshwater underlain by brackish water or saltwater. Groundwater in the part of the lens that is near the ground surface in the central depression of the island is also important for taro cultivation. On some atoll islands, the freshwater lens is thin and highly vulnerable to contamination from the saltwater below, especially if too much freshwater is drawn from the lens.

The El Niño event of 1997–1998 caused severe droughts and water shortages on many of the Pacific Islands including FSM. During the drought, communities were concerned about the high level of demand and increased groundwater withdrawals because of the potential impact of saltwater intrusion on taro, breadfruit, and banana crops. Monitoring data are needed to manage

---

<sup>7</sup> Smith, W.J., J Mount, D. Bennet and P. Shed. 2014. Collaborative research methodologies and the construction of a national geospatial clearinghouse to conserve biodiversity in the Federated States of Micronesia. *Applied Geography* 54:198-208.

<sup>8</sup> Smith, W.J. 2008. *Geographical Journal* Vol. 174 No. 3, pp. 251–268, 2008

rainwater and groundwater resources together and increase the adaptive capacity of low islands to meet the challenges posed by climate variability and change.

The water resources of the 32 atolls of the FSM are under continual threat due to El Niño-induced drought events and sea-level rise. Contamination from septic tanks and wastewater runoff from pig pens is also a major issue.

Another risk is the high sea/surf events. In December 2007 and in 2008, several atoll islands in FSM were flooded by a series of high wave events. These saltwater floods had a significant impact on taro crops that are commonly cultivated in a depression near the centre of the islands. In December 2007, on the outer islands of Chuuk State, where 13,000 people or one-fourth of the state population resides, an estimated 90% of all taro crops were destroyed by saltwater inundation<sup>9</sup>.

Water use within atoll island communities is derived from either captured rainwater (typically through a roof-gutter system that feeds a large storage tank) or groundwater. Rain catchment water is preferred for most domestic purposes such as drinking and cooking, whereas groundwater, typically accessed through hand-dug wells lined with concrete or rocks, is used for bathing and washing clothes. Communities may also use coconut juice to supplement drinking water.

Rain catchment tanks vary in construction material and size. Older tanks are made from concrete, whereas newer ones are made from fibreglass. Depth to water in the hand-dug wells ranges from 1-3 m and fluctuates with the rise and fall of the tides. The water is extracted by either a rope and bucket or a small electric pump and is typically shared by several households.

In general, only large leeward islands appear to be able to maintain substantial freshwater lenses during both average and drought conditions. Most FSM atoll islands are windward and hence contain only a thin lens, irrespective of the rate of rainfall. These observations provide water resource managers of atoll island communities with important generalizations regarding the sustainability of island resources and can be used for future planning within these communities.

The sustainability of water resources on atoll islands is therefore of serious concern due to their small catchment area, low-lying topography, isolation from other island communities, and the continual threat of El Niño-induced droughts. Most of the 32 atolls within the FSM are permanently inhabited, but their residents have always been at risk of water shortages. Groundwater resources are particularly important reserves, since the small exposed area of the island land surface and the high permeability of the carbonate sediments preclude the development of natural surface water bodies or reservoirs. Man-made storage tanks are used to collect rainwater, but these can become depleted quickly during droughts. At such times, island residents rely on groundwater to fulfil their domestic water needs. The fresh groundwater, residing in the “freshwater lens”, however, is also subject to stress and threat of depletion during El Niño-droughts.

The FSM Government is seeking to make each atoll island community sustainable in regard to water resources. Success obviously depends on maintaining sufficient potable water on each atoll island during even the most severe droughts. Therefore, the volume of freshwater reserves must be predicted for periods of scarce rainfall rather than for normal climate conditions.

---

<sup>9</sup> Keener, V. W., Marra, J. J., Finucane, M. L., Spooner, D., & Smith, M. H. (Eds.). (2012). *Climate Change and Pacific Islands: Indicators and Impacts*. Report for the 2012 Pacific Islands Regional Climate Assessment. Washington, DC: Island Press.

## **Proposed Focus Area**

The Government of FSM has identified two outer islands each in Pohnpei, Chuuk and Yap States as priorities for the water security component of this proposal to the Adaptation Fund. These are Kapingamarangi and Nukuoro in Pohnpei; Satawan and Lukunor in Chuuk and Eauripik and Woleai in Yap. The majority are among the atolls most remote from their respective mainlands. The Government has also focused on building the capacity of the communities of Malem and Utwe in Kosrae to respond to climate change as well as improving the resilience of its infrastructure and natural environment to climate change under the coastal component of the proposal. The socio-economic profiles of each of the States and the proposed sites are summarised below.

### **Yap State**

Yap State consists of four main islands of Yap Island, Tomil-Gagil, Maap and Rumung and eight smaller islets sharing a common coral reef. Colonia is the capital of Yap State. It administers both Yap proper and 14 atolls reaching to the east and south for some 800 km, namely Eauripik, Elato, Fais, Faraulep, Gaferut, Ifalik, Lamotrek, Ngulu, Olimarao, Piagailoe (West Fayu), Pikelot, Sorol, Ulithi, and Woleai atolls, as well as the island of Satawa. Yap Island accounts for 84 percent of the state's total landmass and is home to two-thirds of Yap State's population of 12,055 (FSM 2010 Census).

The significance of climate change to Yap State is set out in the Joint State Action Plan. As the westernmost state of FSM, Yap is exposed to a range of threats that create significant vulnerabilities for the state. Yap is located in 'typhoon alley', is likely to be disturbed by earthquakes and tsunamis, and suffers droughts due to the impact of ENSO. ENSO is also the cause of both excessive and below average rainfall. Yap is drier than the other states of FSM and is highly susceptible to drought. The lack of adequate water storage capacity on the outlying islands increases the inhabitants' vulnerability to the impacts of drought. Yap is very vulnerable to flooding during typhoons and storm surges. The State does not regularly receive large amounts of rain so the damage from extreme surge and rainfall events is usually much more intense.

The distances between islands makes it difficult to get much needed food, water and medical supplies to residents after a disaster, meaning Yap is more vulnerable to health and other secondary impacts of disasters than the other FSM states. Through July 2015 and January 2016 island leader and community consultations, facilitated by the Government of Yap through the Department of Resources and Development and SPREP, the atoll islands of Eauripik and Woleai were nominated for water security measures (Section II.H). The most recent impacts caused by Typhoon Maysak and the recent 2015-2016 El Niño phenomenon was felt strongly at these islands requiring water resources to be secured.

### **Chuuk State**

Chuuk is located (830 nm) to the west of Yap state, with Pohnpei (1,208 nm) and Kosrae (1,500 nm) to the east. It is the most populated state of FSM. Chuuk State consists of several island groups with a combined population of 48,615 (FSM Census, 2010). The 2010 Census reported fewer residents in the State compared to 2000 (-1.0 percent decline) as a result of substantial net-migration to neighbouring US Territories, Hawaii, and the US mainland. This was associated with the recent mixed economic fortunes of the State.

Satawan with a population of 692 and Lukunor with 848 are the two Chuuk atoll communities that will be addressed by the project. These islands are only three to five metres above sea level and

are prone therefore to impacts of sea level rise. The islands' water wells are brackish and provide only limited water. Some wells are only used to draw water for washing and cooking during drought, as it is unsafe for general consumption. Most water wells are not covered, and therefore contamination from seawater, e-coli, and humus is common. Most households on both islands have at least one water tank, which has been insufficient during drought. The rainwater harvesting systems are in poor condition as a result of sustaining damage from typhoons, lack of spare parts and poor maintenance, leaving these communities highly vulnerable to drought. During periods of drought, people and animals often resort to coconuts and root trees for water and hydration.

## **Pohnpei State**

Pohnpei is a "high" volcanic island, having a rugged, mountainous interior with some peaks as high as 760 metres. It measures about 130 kilometres in circumference and is roughly circular in shape. Pohnpei Island is the largest, highest, most populated, and most developed island in FSM. A coral reef surrounds the island, forming a protected lagoon. There are no beaches on Pohnpei – the coast is surrounded by mangrove forests/stands growing on muddy substrate eroded from interior wetlands in the rainy environment. Several smaller islets, many of them inhabited, lie nearby within the lagoon-reef complex. The population of Pohnpei is approximately 34,840. Pohnpei is more ethnically diverse than any other island in the FSM. This is largely due to it being home to the capital of the national government, which employs hundreds of people from the other States with distinct ethnic and cultural origins.

Kapingamarangi and Nukuoro are the two Pohnpei atolls that will be addressed by the project, with a population of 350 and 210, respectively. The atolls' groundwater resources are already susceptible to seawater intrusion, underground water pollution and surface water pollution from agricultural practices. The western reef rim of Kapingamarangi atoll is almost submerged at high tide. Parts of the islets on this western reef that are used for growing fruit and vegetables are now under threat. As a result, the islanders are now looking to move the growing of fruit and vegetables to the same islets where they raise livestock, as well as on the main island of Touhou where people reside. This change is already putting pressure on the water resources on Touhou, where the highest point is only 90 cm above sea level. On Nukuoro, the staple food crop is taro, which is highly susceptible to saltwater intrusion. During drought, the communities use raised swamp taro patches as water reservoirs to catch water for cooking and washing. Buckets and recycled oil-drums are a common method of storing water at the household level. The population of Nukuoro is highly vulnerable to water and vector-borne diseases as a result of poor water quality.

## **Kosrae State**

Kosrae is the easternmost State and second largest island of the FSM, located approximately 600 km (372 miles) southeast of Pohnpei. Kosrae has a land area of 112 km<sup>2</sup> (42 square miles) and an Exclusive Economic Zone (EEZ) of 200 nm. Geographic isolation and poorly developed infrastructure are major impediments to Kosrae's (and FSM's) economic growth, and poverty is among the highest in the Pacific region with 23 percent unemployed in 2010. Between 1997 and 2010, Kosrae's population declined by 12 percent to its current population of 6,616 people (FSM Census 2010), which is 6 percent of FSM's population. The negative population growth is largely due to considerable out-migration to the US and its territories. Accordingly, the working population age has dramatically declined, significantly reducing the productive workforce and local production (UNFPA, 2013). This trend is mainly attributed to poor economic performance and reductions in the public sector, which has traditionally been the main employer.

Kosrae is the only State without an outer island. It is divided into four municipalities, with respective populations as follows: Lelu (2,160), Malem (1,300), Tafunsak (2,173) and Utwe (983).

Geographically, the State is characterized by steep mountains and deep valleys covered with thick, fertile tropical vegetation and forests, and dense mangrove forests in coastal areas. The island's main natural resources are its abundant forests with significant agricultural potential, marine products, and deep-seabed minerals<sup>10</sup>.

While FSM currently has no national strategy for coastal zone management, Kosrae has developed a strategic plan that addresses coastal zone management in view of adverse impacts of coastal hazards and climate change on development and infrastructure. Known as the Kosrae Shoreline Management Plan (SMP) this was developed with considerable community consultation between 1998 and 2000 and updated with further consultation in each municipality in 2013. The SMP sets out the principles for coastal development in Kosrae over the coming decades, and details eight key strategies for responding to climate change and sea level rise and increasing the resilience of Kosrae's coastal communities over the next one to two generations (20-50 years).

## Climate Change Impacts and Risks

The future for FSM does not look favourable for any development that is based on a business-as-usual approach. From now until 2100, according to PCCSP and PACCSAP (Australian BoM and CSIRO, 2011, 2014); the latest global climate model (GCM) projections and climate science findings for FSM indicate that:

- Surface air temperature and sea surface temperature are projected to continue to increase (very high confidence);
- El Niño and La Niña events will continue to occur in the future (very high confidence), but there is little consensus on whether these events will change in intensity or frequency;
- Average annual rainfall is projected to increase (medium confidence), with more extreme rainfall events (high confidence);
- Drought frequency is projected to decrease (medium confidence);
- Ocean acidification is expected to continue (very high confidence);
- The risk of coral bleaching will increase in the future (very high confidence);
- Sea level will continue to rise (very high confidence); and
- Wave height is projected to decrease in December–March (low confidence), and waves may be more directed from the south in June–September (low confidence).

A number of studies suggest that global warming could accentuate the current climate regimes and the changes that come with ENSO events (e.g. Hay and Pratt, 2013). This will mean that the inherited and natural coping strategies that the inhabitants of the atoll islands and the atoll environment of FSM will not be enough to respond to these new climate regimes. It will be an ongoing challenge and burden to maintain and sustain the sensitive balance between ecosystem dynamics, the health of the marine environment, human settlement patterns and coastal resource use.

FSM's climate and sea level are both strongly modulated by the ENSO. Following El Niño conditions, the country typically experiences drought. Severe drought events have resulted in water and food shortages as well as the occurrence of fires. Effects of El Niño on the FSM involve the persistence of a high-pressure weather zone over the Western Tropical Pacific for many months, blocking low-pressure, rain-bearing air masses. Nearly all extremely dry years in the FSM

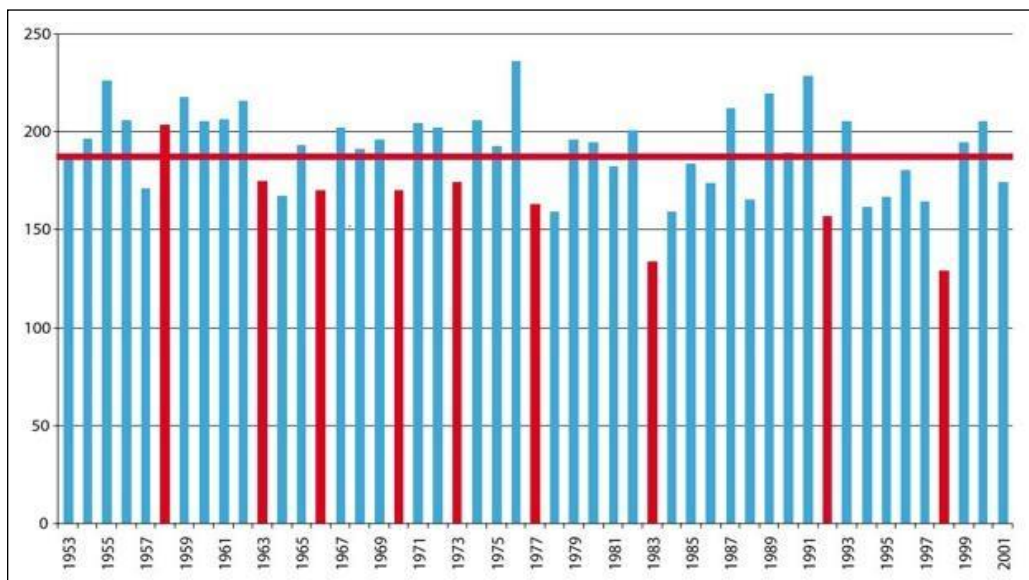
---

<sup>10</sup> Federated States of Micronesia Infrastructure Development Plan FY2016-FY2025. Volume 6 Yap State Infrastructure Development Plan

occur during the year following an El Niño event (Figure 2). In some years, drought conditions have continued through the wet season.

The driest year on record in Pohnpei and throughout most of Micronesia occurred in 1998, following the major El Niño of 1997. Some El Niño years are very wet depending upon the behaviour of typhoons and the monsoon trough. Most La Niña and neutral years have precipitation that is near normal to slightly above normal, unless it is a year following an El Niño, when rainfall is below normal. Deleterious effects include desiccation of grasslands and forests, drawdown of streamflow and well-heads, and wildfires<sup>11</sup>.

The droughts of 1982-1983 and 1997-1998 were especially severe on terrestrial habitats, increasing localized threats to biodiversity. Groundwater sources were taxed, agricultural systems damaged, and problems associated with wildfires and invasive species were greatly aggravated. Insufficient rainfall caused water and food shortages, including staples such as taro, coconut, breadfruit, banana, yam, sweet potato, citrus, and sugar cane. Communities in the atolls survived because bottled water, food supplies, and reverse osmosis pumps were imported. Water rationing for only two hours a day in Pohnpei was necessary. High near-surface lagoon and ocean water temperatures, especially associated with low water spring tides, caused coral bleaching and damage to inshore marine ecosystems (Falanruw, 2001). Poor potable water quality resulted in cases of typhoid and cholera. There was also a decrease in fish catches, possibly due to the variations in water temperature that occur during El Niño events.



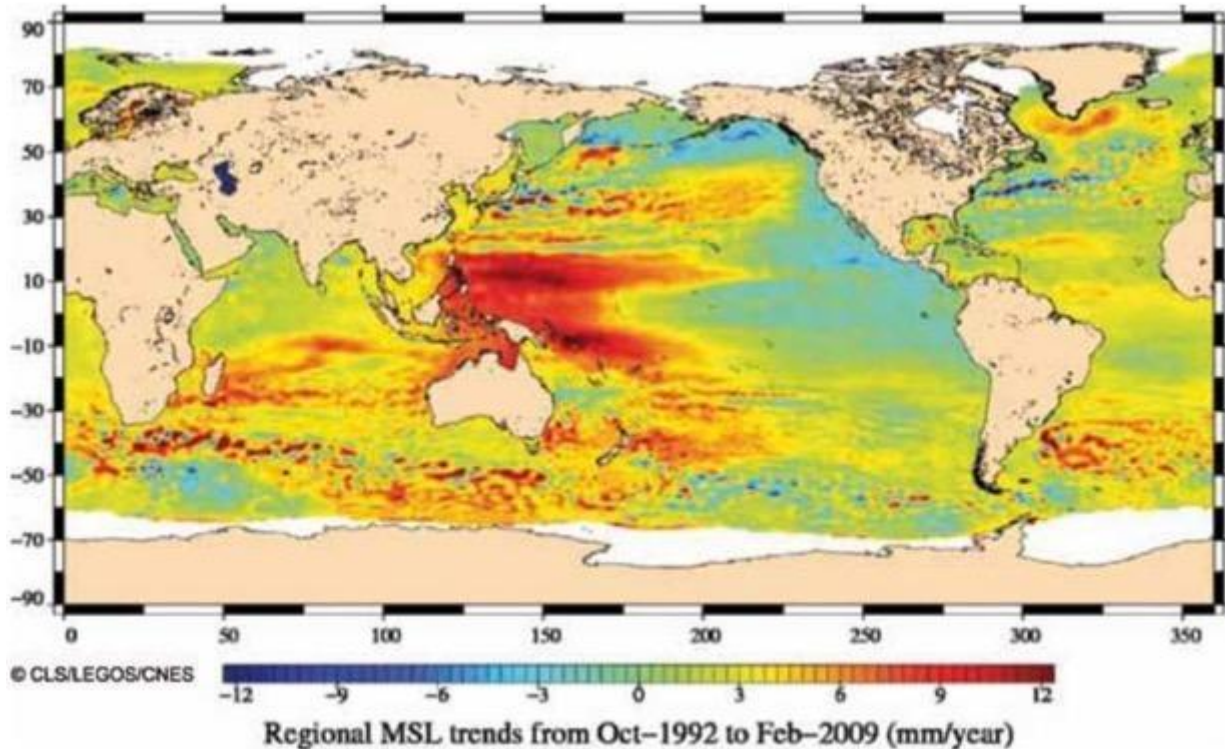
**Figure 2. Time series of annual rainfall at the Pohnpei Weather Service Observatory (WSO). Most post-El Niño years (red bars) are dry.**  
(Source: Lander and Khosrowpanah, 2004)

## Sea Level and Extreme High Tides

FSM is located in part of the global ocean that has experienced some of the highest rates of sea-level rise (Figure 4) over the period of available satellite and tide gauge monitoring. Data from the Topex/Poseidon and Jason-1 satellites makes it possible to determine rates of sea-level change between 1992 and 2016.

<sup>11</sup> FSM Second National Communication Report to the UNFCCC, 2015.

Monthly averages of the historical tide gauge, satellite (since 1993) and gridded sea-level (since 1950) data agree well after 1993. These data indicate an interannual variability in sea level around FSM of about 26 cm (10 in) (estimated 5–95% range), after removal of the seasonal cycle (Figure 3). FSM’s climate and sea level are both strongly modulated by the ENSO. These variations are important as drought, floods, and marine inundation due to high sea levels may damage soil and degrade food resources and drinking water. During an El Niño year, the mean sea level drops across most of Micronesia. During La Niña, the sea level is elevated above its normal value. These changes in sea level are highly coherent across the region from Yap to Guam, Chuuk, Pohnpei, and Kosrae.



**Figure 3. Rate of Sea Level Change, 1992 - 2009**

## Rainfall

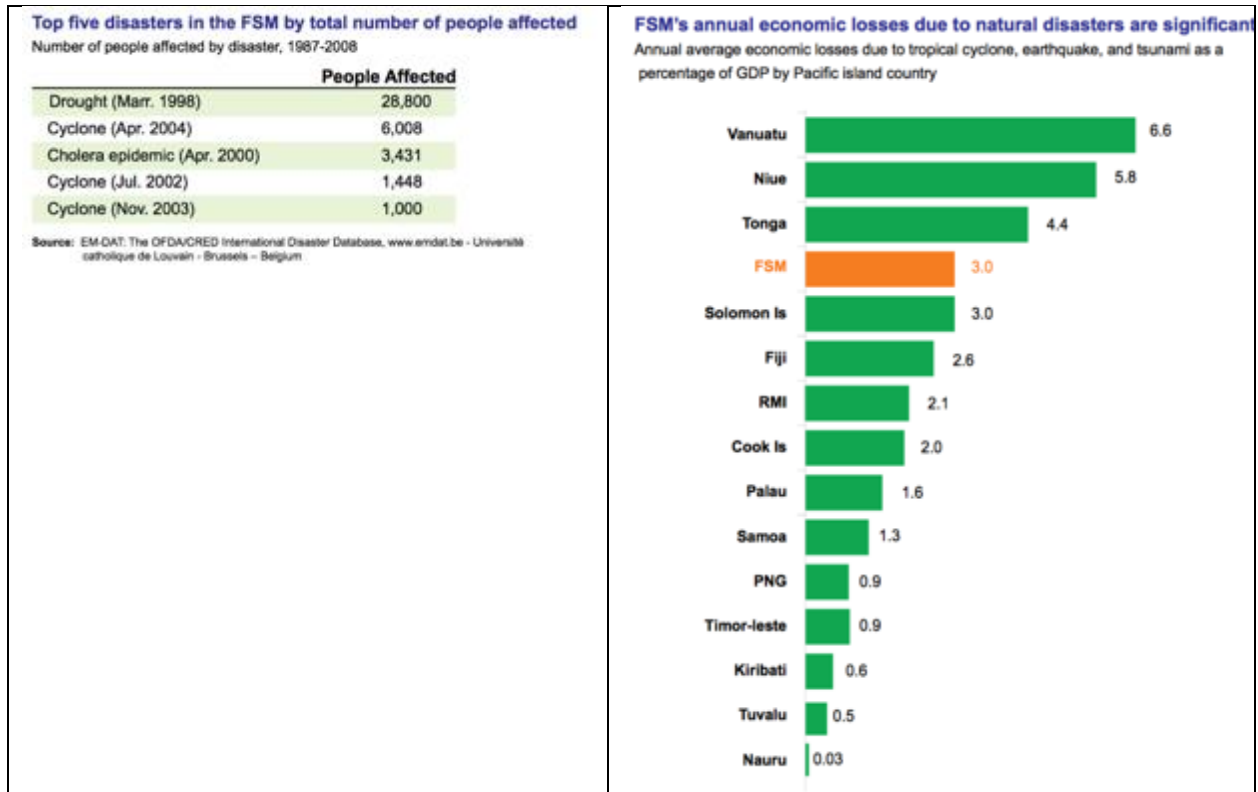
For FSM, wet season (May-October), dry season (November-April) and annual average rainfall amounts are projected to increase over the course of the 21st century. There is high confidence in this direction of change. Most models used in the study indicate little change (-5% to 5%) in rainfall by 2030. However, by 2090 the majority project an increase (>5%) in wet season, dry season, and annual rainfall, with up to a third projecting a large increase (>15%) for eastern FSM under the A2 (high) emissions scenario. There is moderate confidence in this range and distribution of possible futures.

There is an inconsistency between the projected increases in rainfall described above and the recent declining (Pohnpei) or relatively steady (Yap) trends observed at individual meteorological stations. This may be related to local factors not captured by the models (e.g. topography), or the fact that the above projections represent an average over a relatively large geographic region. Models do not agree on future ENSO conditions and therefore on the effect of ENSO on future

rainfall patterns. However, models do agree that as a global average, tropical settings are likely to see increased rainfall and rainstorm intensity.

## Vulnerability Assessment

Like many Pacific Island countries, the FSM's low-lying atolls and coral islands are very vulnerable to natural hazards and disasters such as cyclones, sea surges, and droughts. On average, annual economic losses due to natural disasters amount up to three percent of GDP.



In FSM, low coral-based outer islands are especially isolated and require significant effort to reach from the main islands by boat or small plane. Of great biological significance are the coral fringing reefs attached to land and extending watersheds into the marine environment in lagoons and the open ocean<sup>12</sup>.

The distinction between “high” islands and “low” atoll islands is essential to explain the different climates on islands, their many specialized terrestrial and marine ecosystems, and the forms of human communities they currently support. The terrain of high islands is characterized by abrupt elevation changes (mountains, sheer cliffs, steep ridges and valleys), with the altitude and size of these features varying according to the age of the island. On high islands, orographic rainfall (rain associated with or induced by the presence of mountains) can cause the island to receive much higher rainfall than the surrounding ocean and is responsible for large differences between leeward and windward rainfall. The landscape on high islands is conducive to the formation and persistence of freshwater streams and the development of soils that can support large and diverse plant and animal populations.

<sup>12</sup> Ibid

In contrast, the low atoll islands are small and flat. They are not high enough to generate orographic rain, and thus the amount of rainfall on low islands is close to that for the surrounding ocean. The atolls generally lack the freshwater and fertile soils that are characteristic of volcanic islands and have limited terrestrial resources. Low islands are especially prone to drought, but their varied coral reef, mangrove, and lagoon environments support rich marine ecosystems. Because high islands have more land and freshwater resources than low islands, they have more long-term options for responding to changes in sea level, rainfall, and other climate variables. The amount of land on volcanic islands that is flat enough for large-scale settlement, development, and agriculture is limited, however, resulting in high concentrations of population, infrastructure, and commercial development in low-lying coastal areas. Thus, while communities on high islands and low islands have somewhat similar short-term challenges associated with climate change, they have different degrees of flexibility in how they can adapt.<sup>13</sup>

Most of the 32 atolls within the FSM are permanently inhabited, but their residents have been continually at risk of water shortages. Groundwater resources are particularly important reserves, since the small exposed area of the island land surface and the high permeability of the carbonate sediments preclude the development of natural surface-water bodies or reservoirs. Atoll aquifers consist of a layer or “lens” of freshwater floating on saltwater. Recharge from rainfall typically forms a thin lens of freshwater that is buoyantly supported by denser, underlying saltwater, and mixing forms a zone of transitional salinity. The thickness of this mixing zone is determined by the rate of recharge, tidal dynamics, and hydraulic properties of the aquifer.

Results from a recent study by a team of researchers from FSM, Guam and the USA, indicate that out of 105 major islands on FSM atolls, only six would likely retain sufficient groundwater to sustain the local community during an intense drought.<sup>14,15</sup>

**Box 1. The Special Challenges of FSM's Atolls<sup>16</sup>**

Low-lying atoll islets pose special management challenges in FSM. Dozens of remote atoll islets are occupied by human communities of a few hundred people each.

These islets are composed of sedimentary accumulations of calcium carbonate sands and cobbles derived from the skeletal fragments of reef-dwelling organisms including coral and various carbonate-secreting algae. Some sediments are loose, and others are lithified by natural cements. Loose sedimentary deposits may be transported in various directions (seaward, lagoon ward, or along the shore) and redeposited on the island surface by storm overwash and winds.

Some researchers hypothesize that the tendency for high water events to carry sediment from the reef margin into island interiors may allow these islands to accrete upward with rising sea level. The islet landform might thus persist under a regime of accelerated sea-level rise associated with global warming. Other researchers speculate that atoll islets are pinned on the reef by rock ramparts and when rising waters breach these cemented deposits on oceanic shores, the islet will become unstable and rapidly erode out of existence.

<sup>13</sup> Keener, V. W., Marra, J. J., Finucane, M. L., Spooner, D., & Smith, M. H. (Eds.). (2012). *Climate Change and Pacific Islands: Indicators and Impacts*. Report for the 2012 Pacific Islands Regional Climate Assessment. Washington, DC: Island Press.

<sup>14</sup> For example, the severe El Niño-induced drought conditions of 1997-1999 in FSM caused water and food shortages including staples such as taro, coconut, breadfruit, banana, yam, sweet potato, citrus, sugar cane, and others. Communities among the atolls survived because bottled water, food supplies, and reverse osmosis pumps were imported. This was an extreme event and provides a worst-case scenario for use in planning for future droughts.

<sup>15</sup> Ibid.

<sup>16</sup> Fletcher C.H. and B.M Richmond. 2010. *Climate Change in the Federated States of Micronesia: Food and Water Security, Climate Risk Management, and Adaptive Strategies*. Center for Island Climate Adaptation and Policy.

The debate among geologists regarding the fate of atoll islets neglects a key point that is critical to the communities living on these islands: marine inundation, the same process that carries sediment to the island interior, is extremely damaging to atoll freshwater supplies, the soil, the forests that supply food, and the wetlands in which island residents grow taro as a consumable staple. Long before the question of atoll landforms surviving sea-level rise is settled, human communities could be forced to abandon these environments unless a climate adaptation strategy is developed and implemented that provides them with potable water and sufficient food.

The following strategies for adapting to drought and improving sustainability under restricted water conditions have been recommended, with all but strategy 2 directly relevant to FSM's atoll communities<sup>17</sup>:

1. Implement a water resources research programme that improves understanding of groundwater, surface water, and their sustainable use.
2. Improve high island water accessibility and retrofit and replace infrastructure in the context of climate risk management.
3. Predict drought events and plan for increased frequency and duration of drought including improvements to emergency services.
4. Plan for more intense rains and the impacts that accompany them: flash flooding, mass wasting, inundation, drainage problems, cut-off communities, and others.
5. Improve low island water planning, usage, and conservation.
6. Identify data gaps in water resources and steps to fill these.
7. Support hydrologic modelling of island aquifer systems.
8. Support down-scaled climate modelling that emphasizes water resources.
9. Expand network of water monitoring instrumentation.
10. Develop a water management plan for each island including each inhabited atoll islet and neighbouring resource islets.

## National Level Response to Vulnerability

The FSM Strategic Development Plan addresses climate change by raising awareness of climate change among the general population; developing coastal management plans in all four states; and developing ways to “climate proof” facilities and structure that support social and other services. In 2012, the Presidential Task Force for Disaster Management decided that a Disaster Risk Management (DRM) and Climate Change Policy should be developed for the FSM, building on the Climate Change Policy 2009, and the Disaster Relief Act 1989 to provide overarching policy guidance for joint DRM and Climate Change Action Plans at State level.

The Strategic Development Plan (SDP) for FSM provides a road map for social and economic development for the 20 years (2004–2023)<sup>18</sup>. The SDP and the Infrastructure Development Plan 2016-2025 (IDP) both recognise the need for mitigation and adaptation measures to limit the impacts of climate change. FSM developed a Multi-State Hazard Mitigation Plan in 2005, and in 2009 a national Climate Change Policy was adopted. The country developed a combined Policy for Climate Change Adaptation and Disaster Risk Management in 2013. This is being implemented through State Joint Action Plans for Climate Change and Disaster Risk

---

<sup>17</sup> Fletcher C.H. and B.M Richmond. 2010. Climate Change in the Federated States of Micronesia: Food and Water Security, Climate Risk Management, and Adaptive Strategies. Center for Island Climate Adaptation and Policy.

Management. The Office of Environment and Emergency Management (DECEM) is the focal point for all government climate change activities.

While each State has its own strategic development plan, Kosrae is the only State with a climate-responsive Strategic Development Plan (2013–2024). The SDP recognises that “the most prudent approach to addressing effects of naturally occurring events (climate change or disaster risks) long term would be to divert development and settlement along the coast to inland and higher grounds” (SDP 2013–2024, p. 29). The Environmental Results and Targets No. 6 states that by 2023 capacity is strengthened at all levels to climate change adaptation, and management and mitigation of risks of disasters enhanced so that communities are resilient to impacts of climate change and disaster risks. Resilience to climate change is also included within strategies for agriculture.

FSM currently has no national strategy for coastal zone management. The State of Kosrae, however, is the first to develop a strategic plan that addresses coastal zone management in view of the adverse impacts of climate change. Kosrae has a Shoreline Management Plan (SMP), first developed in 2000 and revised and updated in 2014 (Ramsay et al., 2014). The SMP sets out the principles for coastal development in Kosrae over the coming decades, and details *eight key strategies* for increasing the resilience of Kosrae’s coastal communities. Taking on board lessons and practices from the Pacific Adaptation to Climate Change programme (PACC) and other coastal projects, this proposal aims to upscale and replicate lessons learned and best practices through guidance of these eight strategies of the SMP for Kosrae. The eight key strategies are:

- i. Continued development and strengthening of community awareness including outreach activities with a focus on effective natural coastal defence and Kosrae-relevant climate change impacts and adaptation options.
- ii. Amendment of the Kosrae Island Resource Management Authority (KIRMA) Regulations for Development Projects to incorporate climate change considerations and strengthening of regulation implementation to support successful long-term risk reduction and adaptation.
- iii. Over the next one to two generations the primary coastal road network and associated infrastructure currently located on the beach/storm berm is developed inland away from long-term erosion and coastal inundation risk.
- iv. Ensure new development (property, infrastructure) is located away from areas at risk from present and future coastal hazards or is designed with coastal hazards in mind.
- v. Implement a program to encourage existing residential property owners to reposition homes away from areas of high risk from present and future hazards. This may be a staged approach over time as homes are routinely replaced or renovated. Objective prioritization of properties most at risk should also be explored.
- vi. Incorporate a grant component into the housing loan program to help encourage new property to be constructed in areas not exposed to coastal, river floor or landslide hazards.
- vii. Commence community and state discussions to develop a relocation strategy and identify potential approaches to support relocation from areas exposed to coastal hazards where no alternative land is available.
- viii. A strategic approach is adopted for the ongoing provision of coastal defences. These should be considered only where it is sustainable long-term option, or where it is accepted as a transitional approach to protecting areas over the short to medium term to enable relocation strategies to be implemented.

## **Water and Sanitation**

There are significant differences in water and sanitation coverage between and within the four States of the FSM. Chuuk and the outer islands of Yap are especially lagging. Access also varies according to socio-economic status; poorer households are less likely to use improved sanitation facilities than wealthier households.

Water quality and resultant health concerns remain a major challenge in the FSM. Only five out of the approximately 70 public or community water systems serving the main islands feature any type of treatment and even here, water is not consistently “safe” due to inadequate system maintenance and irregular supplies (FSM 2010 MDG Report, p. 80). Moreover, two of the five public sewerage systems available in the FSM pump raw sewage directly into the lagoons without treatment.

The FSM’s Strategic Development Plan 2004-2023 gives high priority to water and sanitation issues with significant infrastructure development funding earmarked to the sector. However, FSM did not meet its own national targets, set for 2010, to provide universal access to safe drinking water and reach 50 per cent of rural and 100 per cent of urban households with sanitary latrines (urban 100%, rural 50%).

## **The Significance of Local Decision-Making to Water Security Adaptation in FSM**

Throughout FSM but especially on the small, low islands, land is scarce. Decision-making has traditionally rested with landowners. Land equals power and land possession and occupancy influence political relationships and decision-making. Complex, diverse, and often competing tenure systems governing ownership and access rights to land have developed throughout the islands. Traditionally, inheritance of land rights depended on membership in a lineage or clan and often was subject to chief-centred authority and control, but in most cases, the oldest male member of the lineage managed the estate. However, after a century of colonial rule, systems of land tenure followed a path away from descendant group ownership toward a western model of individualized tenure. Greater individual self-interest accompanying westernization is weakening traditional systems of land tenure based on lineage. However, authority regarding land use lies also with the local community. Hence, the implementation of any adaptation strategies requires that landowners, local communities, and decision-making bodies are all in agreement with regard to the problem, the need for a solution and the design of adaptation steps. Envisioning changes within the familiar framework of the existing system is more likely to engender greater trust, willingness, and acceptance compared to an approach that does not incorporate familiar elements.<sup>19</sup>

## **Existing Resilient Practices in Water Security**

The following table (Table 3) shows a summary of country experiences and practices that have improved resilience and reduce vulnerability to threats in the water and food security and food production sector from the Pacific. These are accepted or prescribed as being correct or most

---

<sup>19</sup> Ibid.

effective (i.e., best practices)<sup>20</sup>. This project would refer to and consider these interventions to improve the selection and implementation of activities that will provide the most effective, efficient, sustainable, and more relevant approach to improve resilience of communities to climate change.

**Table 3. Relevant adaptation measures for water security in the Pacific**

Countries Implemented	Demonstrated adaptation measures for water security
Nauru	By improving resilience to drought by improving management of the island's water supply, Nauru introduced solar water purifiers. The units which have solar panels linked to a water distillation circuit, produce clean drinking water from non-potable sources such as seawater or contaminated groundwater. Nineteen households had solar purifier units fitted, providing 80 litres (L) of additional potable water per day per household. During a drought, this can be used for drinking, cooking and if in sufficient quantity, personal bathing. Even when not under drought conditions this is a useful and safe potable water supply. The system is operated by the household and does not require any major maintenance. The lifespan of the solar purifier is 15 years and no replacement of material is expected during this time.
Niue	<p>A process of research, consultation and analysis led to the decision to build a tank moulding facility and begin manufacturing water tanks in Niue. Tanks could be made at half the price of importing them, and this would further increase resilience by reducing dependence on imports. The PACC team joined forces with the Global Climate Change Alliance: Pacific Small Island States (GCCA PSIS–SPC) project, which is funded by the European Union and implemented by the Secretariat of the Pacific Community.</p> <p>The facility is capable of producing up to eight 5,000 L tanks each day. The tanks are made of a robust plastic called high-density polyethylene (HDPE), which is imported in powder form before it is processed and moulded into tanks. The tanks are lightweight, there are no joints that can split, and the plastic material complies with New Zealand and Australian safety standards. Properly maintained, the tanks will last for many decades.</p>
Tokelau	Tokelau's three atolls total about 12 km <sup>2</sup> of land, rise to no more than 5 m above sea level, and are home to about 1,400 people. With drought a major threat, the PACC project improved water security in terms of both quantity and quality, at both the household and community levels. Activities on all three atolls have included renovating or replacing water infrastructure such as pipes, guttering, and water tanks; and installing 'first flush diverters' which ensure that contaminants from the roofs do not enter the drinking water tanks.
Tonga	The objective of the Tonga project was to improve the water supply system to provide Hihifo residents of the main island of Tongatapu with better access to water in terms of reliability and pressure, and better water quality; and to enhance the capacity of the residents to sustainably manage their water resources and to effectively operate and maintain the improved water supply system. A survey of all 354 households and a focus group discussion with key members of the communities found that the problems were due to a combination of natural, governance and technical factors: the fragile and thin water lens which is increasingly vulnerable; a lack of community participation in the management of

<sup>20</sup> The PACC publication series have been reviewed to ensure all information about on-the-ground demonstration activities of the project are best practices (<http://www.sprep.org/pacc/publicatoins/technical-reports>). Lessons learned have been captured in the Experience series of the project and is available online in the same address as well.

	<p>the precious water resources; and technical issues, such as breakdown of pumps and leakages. Solutions proposed included:</p> <ul style="list-style-type: none"> <li>■ Putting a water meter in every household;</li> <li>■ Installing solar water pumps in villages;</li> <li>■ More water tanks;</li> <li>■ Strengthening governance capacities of water committees; and</li> <li>■ Better transparency and communication between water consumers and water committees.</li> </ul>
Tuvalu	<p>Tuvalu built a water harvesting system using a church building roof as water catchment, with guttering and downpipes. Capacity: 700,000 L ground cistern compartmentalized. Community ownership 100%. Management plan between government and community to alleviate drought risks. Replication on another community - Tekavatoetoe community and church with a capacity of 288,000 L storage system succeeded. Launched July 2014. The project targeted Funafuti atoll, Lofeagai community, Target population, 637 (97 households, female 323, male 314). The project impacted on 90% of the village population with indirect benefits to the rest of Funafuti atoll. Individuals of the village now meet the minimum water supply of 40 L per household per day during dry periods and droughts.</p>

### Existing Resilient Practices in Coastal Management

**Kosrae, PACC Project:** The PACC project in Kosrae identified a 7km section of the road in the Tafunsak municipality which was being progressively damaged by flooding from heavy rains and high tides. The original road had been designed to withstand a maximum hourly rainfall of 178 mm. Analysis of climate and sea level data, and projections to 2050, concluded that the road should be redesigned to withstand maximum hourly rainfall of 254 mm. Following a socio-economic assessment, community consultations, and input from expert coastal engineers, the road was redesigned and rebuilt to withstand the anticipated heavier rainfall and higher sea levels. Adaptations included raising parts of the road by up to one and a half metres, fitting larger culverts, and improving drainage. The improved road was officially opened in May 2014. The PACC developed guidelines to share experiences with climate proofing the road, which will help others to replicate this success<sup>21</sup>.

The project also installed tide gauge and rainfall gauges in 2011 to improve availability and quality of local climate and sea level data. These now feed into climate-sensitive decision making and development for the State. The project team based in the Kosrae Island Resource Management Authority (KIRMA) also promoted the mainstreaming of climate risk into all development in the State and the country. The team supported development of the Kosrae State Climate Change Act, which was endorsed in 2011, and amendments to Kosrae’s Regulations for Development, which now require all development projects to consider the potential impacts of climate change. The team also contributed to the revision of the 2014 Kosrae Shoreline Management Plan that provides comprehensive strategies for building resilience of Kosrae’s coastal communities and infrastructure and now will guide this project.

The PACC project trialled the implementation of its relocated roads, using this manual as a guide and the purpose is to develop and promote appropriate methods of road engineering that gives the best possible access to communities at minimum cost.

<sup>21</sup> <http://www.sprep.org/attachments/Publications/CC/PACCTechRep18.pdf>

Kosrae has a standard for road design (*Design standards for Kosrae circumferential road extension project*) developed when the circumferential road from Okat to Walung to Utwe was proposed (Barrett Consulting Group Inc, 1987). The standards cover the road pavement design, and associated structures such as drainage, bridges, culverts, and rock revetment for coastal protection. The design standards have been applied for updating sections of the circumferential road, including the section completed under the previous PACC project. These standards are still applicable and have been updated and adjusted based on experience and as new information has become available. This includes:

- Updating rainfall design conditions used in the design of drainage, culverts, and bridges to account for new analysis of extreme rainfall and climate change projections based on the information developed under the Asian Development Bank project: Climate Proofing. A risk-based approach to adaptation. Appendix 1: Federated States of Micronesia Climate Risk Profile<sup>22</sup>
- Refined coastal defence design guidelines and design criteria developed during associated activities related to the development of the original Kosrae Shoreline Management Plan in 1998-2000. These changes are based on best-practice guidelines outlined in *Manual on the use of rock in coastal and shoreline engineering*<sup>23</sup>.

The nature and success of coastal interventions to enhance resilience to impacts of climate change, as shown by examples from Cook Islands, Samoa and Vanuatu are very site-specific. The activities of this project that address coastal resilience base their design and implementation plans against this backdrop of experiences given the similar circumstances, vulnerability, capacity, state of the natural environment, economy and certain social aspects of FSM.

## **Project / Programme Objectives:**

### **Project goal**

The overall goal of the project is to build social, ecological and economic resilience of the target island communities of FSM and reduce their vulnerabilities to extreme drought, sea level rise and other climate risks through water resource management, coastal resource and development planning, and by promoting gender perspectives and ecologically sound climate resilient livelihoods.

### **Project objective**

The overall objective of the project is to reduce the vulnerability of the selected communities to risks of water shortage and increase adaptive capacity of communities living in Woleai, Eauripik, Satawan, Lukunor, Kapingamarangi, Nukuoro, Utwe, Malem to drought and flood-related climate and disaster risks.

The proposed project will contribute to relevant outcomes and outputs of the Adaptation Fund Strategic Results Framework (AFB/EFC.2/3 from 31 August 2010), and corresponds particularly to the following higher order fund-level objectives as follows:

- **Project Objective 1:** Prepare the necessary institutional and regulatory frameworks, policies, guidance, and tools to help deliver a climate resilient FSM.

---

<sup>22</sup> ADB, 2005

<sup>23</sup> CIRIA/CUR, 1991

- **Project Objective 2:** Strengthen water and livelihood security measures to help 6 outer atoll islands adapt to impacts of climate change related to water, health, and sanitation.
- **Project Objective 3:** Provide communities with climate resilient infrastructure to help relocate from high risk coastal inundation sites.
- **Project Objective 4:** Capture and share the local knowledge produced on climate change adaptation and accelerate the understanding about the kinds of interventions that work in island environments in FSM.

### Project strategy

The project strategy is to provide all four (4) State Governments in FSM with development planning tools and institutional frameworks to help coastal communities prepare and adapt for higher sea levels and adverse and frequent changes in extreme weather and climate events. The project strategy is to also provide communities with the resources and technical support needed to adopt and manage concrete climate change adaptation initiatives and actions.

### Project Components and Financing:

Project Components	Expected Outcomes	Expected Concrete Outputs	Amount (US\$)
1. Strengthening policy and institutional capacity for integrated coastal and water management at national, state, and outer island levels	Outcome 1: Strengthened policy and institutional capacity of government to integrate climate risk and resilience into its water and coastal management legislative, regulatory and policy frameworks	Output 1.1. Legislation and policy paper to guide regulation of climate resilient coastal and marine management at national level	\$142,000
		Output 1.2. State regulations for coastal and marine development projects amended to consider climate change risks and resilience measures	\$143,300
		Output 1.3. State Water Outlook and Water Sector Investment Plan developed and implemented	\$315,600
2. Demonstration of water security and sanitation measures in outer islands of Yap, Chuuk and Pohnpei	Outcome 2a: Water conservation and management technology & practices adopted, responding to drought, sea level rise and early recovery from cyclones	Output 2.1. Outer island communities oriented to CC, SLR, and adaptive capacity measures involving water, health, sanitation, and environment	\$365,600
		Output 2.2. Water Harvesting and Storage System (WHSS) repaired and installed in 6 atoll islands	\$2,459,400

	Outcome 2b: Appropriate sanitation measures for the outer islands of Yap, Chuuk and Pohnpei are determined for future investment	Output 2.3. Assessment of viable sanitation measures for outer islands in Yap, Chuuk and Pohnpei	\$275,413
3. Demonstration of adaptation measures for coastal communities in Kosrae State	Outcome 3: Increased resilience of coastal communities and environment to adapt to coastal hazards and risks induced by climate change	Output 3.1. Malem - Utwe inland road and access routes designed for future construction	\$788,000
		Output 3.2. Transitional coastal protection at Mosral and Paal upgraded for immediate coastal protection	\$2,586,000
4. Knowledge management for improved water and coastal protection	Outcome 4: Capacity and knowledge enhanced and developed to improve management of water and coastal sectors to adapt to climate change	Output 4.1. Resource materials developed, tailored to local context, translated, published, and shared amongst various stakeholders	\$431,600
5. Project/Programme Execution cost			\$788,018
6. Total Project/Programme Cost			<b>\$8,294,931</b>
7. Project/Programme Cycle Management Fee charged by the Implementing Entity (if applicable)			\$705,069
<b>Amount of Financing Requested</b>			<b>\$9,000,000</b>

**Projected Calendar:**

Milestones	Expected Dates
Start of Project/Programme Implementation	March 13, 2018
Mid-term Review (if planned)	September 2021
Project/Programme Closing	September 30, 2023
Terminal Evaluation	December 31, 2023

**3. PART II: PROJECT JUSTIFICATION**

**A. Project Components and Activities**

**Component 1: Strengthening policy and institutional capacity for integrated coastal and water management at national, state levels and outer islands**

*Outcome 1: Strengthened policy and institutional capacity of government to integrate climate risk and resilience into its water and coastal and marine management legislative, regulatory and policy frameworks*

**Output 1.1: Legislation and policy paper to guide regulation of climate resilient coastal and marine management at national level**

### **Activity 1.1.1: Review of National-level legislation and policies for (i) infrastructure to identify climate change requirements; and (ii) regulatory and policy framework for climate change**

Current environmental legislation does not necessarily require environmental impact assessments on all projects<sup>24</sup>. All infrastructure development projects are left to their own willingness to comply with relevant environmental planning provisions. Activity 1.1.1 will undertake a legislative and policy assessment to assess the status of legislation and regulations established at the national and state level for (a) infrastructure to identify climate change requirements and (b) the frameworks for considering climate change. This will work to improve clarity on the regulatory responsibilities within the government structures, and identify ways to improve enforcement performance. A detailed consultation and participatory stakeholder engagement exercise, along with a desk review of existing information will be conducted to produce a detailed report/recommendation to the Government on steps forward to strengthen the framework to build climate resilience.

### **Activity 1.1.2: Develop guidance based on recommendations from the review of coastal and marine management legislation and policy and monitor progress of recommendations uptake through relevant Departments**

Following on from the previous activity, Activity 1.1.2 will seek endorsement of the recommendations and work with each relevant Department to develop the guidance on the implementation of the recommendations from the assessment report. Implementation of the recommendations for each relevant Department will continue over the life of the project and beyond.

## **Output 1.2: State regulations for coastal and marine development projects amended to consider climate change risks and resilience measures**

### **Activity 1.2.1: Review of State-level legislation and policies for infrastructure to identify climate change requirements**

Currently, only Kosrae has regulations for development projects. The other three States of Yap, Chuuk and Pohnpei do not. In 2014, the Kosrae Pacific Adaptation to Climate Change (PACC) Project developed the Kosrae Regulations for Development Projects (No. 67-05). These regulations which incorporate climate change impacts and adaptation measures will be considered and used as guidance in this project. One of the key lessons of the Kosrae PACC project was the revision of existing EIA Guidelines and its review processes to incorporate climate change considerations.

This activity involves a series of consultation workshops with all key relevant stakeholders in each of the three states, Yap, Chuuk, and Pohnpei. The consultations will discuss and develop the required regulations, policy, and guidance documents as well as a regulatory framework to effectively take these changes on board at the State congress level. These consultations will follow on from a completed review of the existing regulations on environment protection in each of the three states. The review will seek to examine to what extent climate risks are addressed and if any resilient measures can be identified and/or strengthened. The consultations will provide recommendations on the development of a regulatory framework that will aim to incorporate

---

<sup>24</sup> IDP 2016-2025, Government of FSM

climate risks and resilience measures and provide a roadmap on the development of State regulation for development projects.

### **Activity 1.2.2: Develop guidance based on recommendations from the review of coastal and marine management legislation and policy and monitor progress of recommendation uptake through relevant Departments**

During the priority consultations in July 2015 and January 2016, Yap, Chuuk and Pohnpei stakeholders re-emphasised the need for regulation, policy, and guidance documents to address climate change impacts, similar to those developed by Kosrae. Activity 1.2.2 will develop guidance based on the recommendations from Activity 1.2.1 for the States and endorsed by the States. The project will work with the relevant State Departments to ensure institutional arrangements are developed, enacted, and supported.

Furthermore, the activity will work with the relevant State Departments to address the recommendations and implement them in accordance with the guidance documents. Stakeholder engagement in implementing the recommendations will ensure all development proponents participating in any development along the coastline and in the marine environment of all islands belonging to the States are aware of and enforce the regulations established. In doing so, the project will gather feedback and report to relevant state and national government departments.

### **Output 1.3: State Water Outlook and Water Sector Investment Plan developed and implemented**

The water sector in FSM is under the mandate of the States, and there is no clear lead proponent of water management issues at the national level currently, although discussions are continuing. In recognition of the unique management arrangements on water, the Project will work with the States to develop their Water Outlook and Investment Plans for implementation within each State.

#### **Activity 1.3.1: Support the implementation of State-level Water Outlook and Investment Plans**

Activity 1.3.1 will undertake the development and implementation of the State Water Masterplans, ensuring gender considerations are incorporated throughout the process and into the Masterplans.

Experiences gathered from climate change adaptation projects from the Pacific show that mainstreaming of gender considerations is required at the outset of climate change adaptation planning. It has also shown that the benefits of such mainstreaming at the policy level will trickle down to the most vulnerable at the community levels. The findings from this review will be used to inform and strengthen the Framework for National Water and Sanitation Policy for the FSM by mainstreaming gender aspects. This activity will strengthen the existing National Water Task Force (NWTF) to develop, complete and launch the Masterplans through a gender-sensitized approach.

This activity will use tools for integrating gender perspectives into climate change policies taken from the Pacific Gender & Climate Change Toolkit, developed by Pacific regional organizations<sup>25</sup> - to gather targeted policy-relevant information relating to gender and climate change in FSM. The outline of a gender and climate change assessment for the policy is provided in Table 4 below.

---

<sup>25</sup> GIZ, SPC, SPREP, UNDP, GIZ, PACC Project (2015)

**Table 4. Outline of the Gender Assessment work activity**

Gender Assessment Outline
Introduction, Background
Gender and climate change in FSM: the social dimensions of resilience and adaptive capacity
Why integrate gender? (policy and planning)
Methodology
Limitations
Findings of the Assessment
Policy design and planning
Policy implementation
Key recommendations

The activity will engage the NWTF in implementing the policy elements 4.5 - National Water Outlook, and 4.6 – Water Sector Investment Plan. The NWTF will finalize action plans of these components of the Water and Sanitation Policy and implement the activities.

The Water Outlook Program is an analysis of current trends and future projections of the state of water resources, demand, management issues in view of climate change risks and climate planning. The Program aims to strengthen the monitoring role of government and state-owned enterprises in service delivery for water and sanitation throughout FSM. The activity will develop tailored information on the water outlook, integrated with climate science and meteorology, providing monthly advisory support across FSM to be updated quarterly.

The Water Sector Investment Plan (WSIP) is expected to guide all future investments in the sector to improve the Government’s fiscal and physical effectiveness for more efficient achievement of the sector’s climate resilient targets and goals. The Plan will consolidate existing State Investment Plans to help address the impacts of climate change such as increased variability in rainfall and prolonged droughts, minimise duplication and contradictions, assess the consequences of reduced sector funding compared to plans, population growth, increased demand, and impact of water resources management on the economy. It will acknowledge the highly diverse and vastly different resources and capacities to address the impact of climate change on the supply and treatment of freshwater on the main islands and outer islands of each State. The WSIP will identify investment needs according to the climate resilient strategies, targets, and goals of the water sector, to build its resilience to climate change.

## **Component 2: Demonstration of water security and sanitation measures in outer islands of Yap, Chuuk and Pohnpei**

***Outcome 2a: Water conservation and management technology and practices adopted, responding to drought, sea level rise and early recovery from cyclones***

**Output 2.1. Outer island communities oriented to climate change, sea-level rise,**

## **and adaptive capacity measures involving water, health, sanitation, and environment**

### **Activity 2.1.1: Arrangements for demonstrations of water technologies**

The activity will carry out training workshops on climate change impacts on water and coastal sectors for the States and outer islands. The communities will be actively involved in the orientation on climate change, sea level rise, vulnerability, and adaptive capacity measures involving water, health, sanitation, and environment on the island.

In addition, the Project will provide varied and applicable refresher training. The training will include the use of gender and climate change tools, improving communications between main and outer islands, and application of regulations and policies. There will also be opportunities to provide hands on training e.g. basic plumbing, water tank cleaning and maintenance schedule training for water priority states and outer islands. This will be a proactive adaptive capacity building measure that will be learned from other islands and applied to others. The Project will partner with women's' council groups on the main islands as well as other nongovernmental organizations to carry out this training.

Sex-disaggregated and age-disaggregated group sessions will be carried out in learning, training, and awareness workshops within the communities. The approach will include everyone, through their traditional community-based organizations to actively participate and have their say in activities and strategies of the plan. This will include women, men, youth and elderly and those persons living with disabilities. The meetings may use a variety of tools, including participatory rapid appraisals (PRAs), socio-economic assessment surveys, and gender-sensitization tools.

Through these consultations, other community needs may be identified and addressed to support the activities of the project. These may include basic skills training on managing and implementing project activities on a day to day basis.

With the knowledge and skills developed from the orientation workshops and having clarified and contextualised the social, cultural and environmental aspects of the islands and communities during the inception workshop, the communities will lead in the identification of community, schools, household infrastructures for demonstration of activities of the project.

### **Output 2.2. Water Harvesting and Storage System (WHSS) repaired and installed in 6 atoll islands**

The water harvesting and storage systems will address the climate stresses, namely the prolonged periods of drought such as those experienced in the 1997-1999, 2003-2005, 2015-16 El Niño events, and the extreme weather events leading to high intensity rainfall and lengthening of the dry season months. These climatic stresses necessitated review of atoll water resources that include design and status of wells, sanitation and rainwater tanks and their water holding and storage capacities.

At present, various types of water harvesting systems exist in poor conditions on the islands and people may even resort to coconut juice to meet their water demands<sup>26</sup>. The rainwater harvesting and groundwater wells that exist are largely privately owned. The current rainwater harvesting systems and storage elements include roofing, guttering, down-piping, water tanks and concrete

---

<sup>26</sup> Rapid Assessment Report, March 2016, FSM

tanks. All systems are in poor, basic or unusable conditions due to damage from cyclones and extreme high tide events damaging infrastructure, coupled with no maintenance due to lack of equipment and spare parts<sup>27</sup>. In Yap, for example, 40% of water tanks on all nine outer islands including Woleai and Eauripik do not have proper rain harvesting systems (i.e. tin roofs for collecting rainwater and gutters including down spouts, fasteners, and clips). Nearly 90% of water wells had very low water levels; all are brackish and nearly all were uncovered.



**Figure 4. Sample of water tanks and wells from outer islands – Eauripik, Woleai atoll, Ifalik, and Feraulap atoll**

(Source: Rapid Needs Assessment, March 2016, Yap, FSM)

### **Activity 2.1.2: Carry out ground-truthing assessments**

To reaffirm data and recommendations gathered from the consultations carried out during planning stages (July, November 2015; January, February 2016), and from recent rapid assessments carried out by the Department of Resources & Development, and International Organisation for Migration (IOM) in March 2016, a **ground-truthing assessment** will be carried out. This will include carrying out technical surveys on water, water use in the community villages on island, sanitation and health incidences related to water. These surveys will also collect information on social aspects such as traditional knowledge, cultural and political governance and how these may influence the implementation and management of the project.

This activity will carry out a two-step ground-truthing assessment of data collected from a rapid assessment carried out in March 2016 in the atoll islands of Eauripik, Ifalik and Woleai. The ground truthing assessment will identify household and community infrastructure for demonstration. It will be undertaken in two parts, first to conduct hydrological assessments for each island that include interviews and site surveys. The interviews will be carried out with key personnel that hold responsibilities for water, health, and sanitation on each island. It will also interview women, men, and youth in sample households. The survey will ground truth data on:

---

<sup>27</sup> *ibid*

- Water storage capacity (wells, tanks, etc)
- Available rainwater catchment area
- Water seal toilets (contributing to output 2.3 activities)
- Sewage disposal systems

The second step will be active consultations with the community for finalisation of the site selection for the installation of the water tanks at the household and community levels. Lessons from PACC Nauru have shown that once sites have been established and agreed to, signed agreements between households/community organizations and the island government council should be put in place to ensure the sustainability of the activities throughout and beyond the life of the project. The basic conditions of the agreements are as follows:

Community/private owners agree to:

- access of the privately-owned water infrastructure should be opened to all community population
- undergo training on water conservation practices and maintenance
- carry out maintenance of the installed systems over time per maintenance schedules
- agree to lead in collection of data and participate in monitoring and evaluation of data.
- provide feedback on benefits and challenges of the systems.

Project agrees to:

- provide training on water conservation practices and maintenance
- provision of resources (materials, services)
- provision of spare parts/materials

The results of the community consultations will also produce short (maximum 3 years) or long-term action plans (5 years or more) for managing the water resources on the island. These plans will include three key components: (1) water infrastructure and maintenance (including maintenance schedules); (2) water and health; and (3) awareness and education. The activities outlined under the signed agreements between households and community and the project will also form a part of implementation of the plans.

### **Activity 2.2.2: Repairing household rainwater harvesting and storage systems**

The constituents of the water harvesting, and storage systems include roofing, guttering, downpipes, first flush diverters, cisterns or tank and tank base. The systems are linked to and part of housing infrastructure.





**Figure 5. Installing a rainwater harvesting system at the household level**  
(Source, PACC Niue, 2014)

This activity will rehabilitate, and repair existing materials to close off leaks and improve efficiency of existing rainwater harvesting systems of the households selected from Activity 2.2.1. It will extend the gutters to the full dimensions of the catchment to capture more water; increase the catchment area to improve long-term water security and storage tank size if overflow is frequent.

The repair of household level rainwater harvesting systems and construction of community tank activities will be undertaken under the following minimum requirements:

Household Level	Sub-Activities
<b>Rainwater catchment systems</b>	
Key activities	Repair household rainwater catchment systems
Minimum requirements	<ul style="list-style-type: none"> <li>• Repair existing systems to ensure that there is:</li> <li>• 2 HDPE<sup>28</sup> tanks per household criteria for maintenance without</li> <li>• Extend gutters to full dimension</li> <li>• Increase catchment area by using reliability curves<sup>29</sup></li> <li>• Increasing storage tank volume using reliability curves</li> <li>• Clean up awareness campaign</li> <li>• Clean up and maintenance training</li> <li>• Maintenance schedules established</li> <li>• Project and Household agreement for monitoring and maintenance through duration of project</li> </ul>
<b>Wells</b>	
Minimum safety measures	<ul style="list-style-type: none"> <li>• Construct rim walls extending up off the ground for wells without walls</li> <li>• Build covers for wells without and repair damaged covers</li> </ul>

<sup>28</sup> HDPE – high density polyethylene tanks known for stiffness, strength, toughness, resistance to chemicals and moisture, permeability to gas, ease of processing, and ease of forming.

<sup>29</sup> Beikmann, A., Bailey, R., (2015) Freshwater Resources for Selected Atolls - Recommendations based on Modelling Study. In: Beikmann, A., Bailey, R., Jenson, J., Kottermair, M., Taboroši, D., Bendixson, V., Flowers, M., Jalandoni, A., Miklavčič, B., and Whitman, W. (2015). Enough Water for Everyone? A Modelling Study of Freshwater Resources for Selected Atolls of Yap State, FSM. WERI Technical Report 157. Water and Environmental Research Institute of the Western Pacific, University of Guam, Mangilao, Guam.

The repair and installation of rainwater harvesting systems has worked successfully in many low-lying atoll islands around the Pacific including the Marshall Islands, Tuvalu, Niue, Nauru, and Tokelau.

### Activity 2.2.3: Constructing community rainwater harvesting and storage systems

Community tanks are recommended to assist the larger community in times of drought to relieve pressure on individual household water tanks, and to meet basic water requirements for medium-term survival needs. These include meeting not only the short-term survival requirements of drinking and cooking, but personal washing, washing clothes, cleaning home, growing food, and sanitation and waste disposal<sup>30</sup>.

The construction of community tank activities will be undertaken with the following minimum requirements:

<b>Rainwater catchment systems</b>	
Key activities	Install community tanks
Minimum requirements	<ul style="list-style-type: none"> <li>• Minimum 2 x 5,000 L / 2,000 Gallon HDPE tanks per atoll island &gt; 100 population</li> <li>• &lt;100 population requires re-assessment</li> <li>• &gt; 400 population = 4 tanks</li> <li>• HDPE tanks preferred over concrete tanks</li> <li>• Extend gutters to full dimension</li> <li>• Catchment area sized appropriately to tank volume using reliability curves.</li> <li>• Encourage standalone catchment areas to shelter tanks and fence for protection</li> <li>• Access and maintenance rules established and to include cleaning each tank on a rotation basis, cleaning to be 3 times per year</li> <li>• Rules for access to include access by neighbouring villages in times of drought</li> <li>• Maintenance schedules established</li> </ul>
<b>Wells</b>	
Minimum requirements	<ul style="list-style-type: none"> <li>• Municipal council review, assessment, and executive orders on environmental advice on burials to encourage use of existing cemeteries and reconsider burials in private residences and plots</li> <li>• Exceptions to consider sites down hydrological gradient from wells.</li> </ul>

### Activity 2.2.4: Implementation of a monitoring and maintenance programme

The island coordinators on each outer island will collect information monthly on the repair and construction work and prepare monitoring progress reports on a quarterly basis. A monitoring and

<sup>30</sup> Based on Maslow’s hierarchy of water requirement needs, WHO 2013.

maintenance plan will be developed following completion of repair and construction. Data on water saved, quality, use and distribution, will be collected against the baseline from the surveys. Throughout the duration of the project, the maintenance schedules will be used to monitor the quality and use of assets and provide solutions to maintain the assets using spare parts collected by the project. Climate related extremes and environmental conditions will be recorded as well. The climate extreme events that may occur during the life of the project will be reported against the project and communicated. This will be used to develop lessons and good practices of the project and provide any corrective actions.

***Outcome 2b: Appropriate sanitation measures for the outer islands of Yap, Chuuk and Pohnpei are determined for future investment***

**Output 2.3: Assessment of viable sanitation measures for outer islands in Yap, Chuuk and Pohnpei**

**Activity 2.3.1: Sanitation measures assessed and piloted in outer islands in Yap, Chuuk and Pohnpei**

The cultural diversity amongst the six outer islands of the three States suggests there may be diverse preferences for the types of sanitation technologies used on the islands. The absence of pit toilets on some of the islands on the atolls in Woleai and Eauripik in Yap and Satawan in Chuuk are an advantage for the local groundwater and its quality. These practices should not change if the groundwater is to be retained as a clean and viable source for showering, washing, and cooking, as well as an emergency source for drinking water. The concern, however, is that beaches and shallow seawater are used instead. There is possible evidence of eutrophication during low tide on the lagoon side. When circulation with the ocean is reduced, solar heating of the water is increased, lagoon water can hold less dissolved oxygen. When algal metabolism removes oxygen at night it can cause fish to suffocate. Algal growth in the lagoon is boosted by excessive nutrient input from human waste. Local people have reported that dead fish wash up on the beach following very low tide events on the lagoon side of the island<sup>31</sup>. The onset of climate stresses that include increase in sea surface temperatures will exacerbate this problem contributing to food security issues as well as water, sanitation and health issues.

Activity 2.3.1 will undertake an assessment and pilot of potential sanitation measures in the outer islands which are culturally, environmentally, economically, and socially appropriate. Undertaking extensive consultations with the island communities, the Project will assess the current state of sanitation facilities and the appropriateness (i.e. from a population, cultural, environmental, economic, and social perspective) of these facilities<sup>32</sup>. Depending on the outcomes of the assessments, the Project team will work with the communities to ascertain whether there are other options which could be trialled and whether the community is open to testing other options. The options will be piloted and assessed over the life of the project as part of the monitoring and

---

<sup>31</sup> Based on Maslow's hierarchy of water requirement needs, WHO 2013.

<sup>32</sup> The assessments may yield some disagreements on proceeding with any sanitation options beyond those already in place. The result may come from any of the six island communities due to cultural and social barriers. If this output is not entertained, the project team will refer the community/island to other potential alternative community adaptation priorities they identify, and the activities therein. The community will reach agreement based on these priorities and that are within the scope of the project and aligned with the Fund's mandate. Lessons from PACC, ECOSAN and IWRM, suggest that the project will need to consult with communities on alternative activities at the outset before implementation. This was carried out by the project during the planning stages and a list of alternative adaptation activities that are considered livelihood security measures was produced and listed in the original proposal at Annex 2.

evaluation arrangements. Depending on the results, scaling up can be implemented under future projects.

The second component of the activity involves education and training within the community of Water, Sanitation and Health (WASH) principles. The importance of education and awareness-raising of sanitation and hygiene is critical in reducing illness. The training for WASH is particularly essential in the outer islands because of existing water storage infrastructure that is not maintained and is in very poor condition. The training and baseline surveys will be undertaken in partnership with UNICEF WASH, with the island coordinators and other interested parties trained in the WASH principles to ensure ongoing training and education.

### **Component 3. Demonstration of adaptation measures for coastal communities in Kosrae State**

***Outcome 3: Increased resilience of coastal communities and environment to adapt to coastal hazards and risks induced by climate change***

#### **Output 3.1: Malem-Utwe inland road and access routes designed for future construction**

##### **Activity 3.1.1: Survey and design road and related infrastructure to ensure climate change resilience**

The Kosrae Shoreline Management Plan developed a prioritised list of inland road and essential infrastructure development (Figure 10) to be implemented over the next one to two generations as an essential component for developing resilience to coastal-related hazards and sustained adaptation to climate change. Developing and upgrading the inland road between Malem and Utwe was considered the highest priority due to the current threats posed to vulnerable populations and infrastructure due to wave over-washing and potential breaching of the narrow coastal berm on which present infrastructure and much of the population of Utwe and Malem Municipalities are located. At Paal and Mosral, there is a very real present-day risk that a breach in the berm could occur, resulting in road access to Utwe being cut off and the potential loss also of power and telecommunications which are located alongside the road. Relocating infrastructure is a key enabling mechanism to allow gradual relocation over the next 10-20 years of Malem and Utwe communities exposed to ever increasing coastal erosion and inundation impacts. In addition to developing the inland road and supporting infrastructure complementary activities will be conducted to begin streamlining the process and help both communities relocate inland.

While the direct beneficiaries of the inland road will be the population situated in the Malem – Utwe municipal village communities, all of the Kosrae population will be an indirect beneficiary once construction is completed. There are other potential beneficiaries such as the approximately less than 100 people who reside in Walung municipal. Walung village community does not have access to the main roads of the island. Everyone at present uses boats to travel to Tafunsak. The only road from Walung to the rest of Kosrae is via Utwe and ultimately this will be the only road to Walung as the road south from Tafunsak is now suspended due to the Yela area being protected. In essence, there are two out of five villages reliant on the road access as the only connection to the rest of Kosrae, including the health services, high school, Government centre, airport and port.

The intention is to develop the road to the same standard or higher, as the existing two lane paved road based on the design standards developed for the Kosrae Circumferential Road Extension

Project (Barret Consulting Group Inc, 1987), and located around the base of the volcanic part of the island as presently occurs between the airport and Tafunsak village (Figure 11). Over the next one to two generations the inland road will become the primary road access from Utwe and Malem to the main Government Centre at Tofol and to the airport and port.

A recent project review upgraded Environmental and Social Safeguards Plan, and the road designer initial report findings, have indicated the current level of investment and the proposal outlined under the original project plan is not viable under the current project investment. A staged approach based on the priorities identified in the Kosrae Shoreline Management Plan is therefore being adopted to the development of the relocated road.

Stage 1, as per the original project plan, prioritises the full design of the inland road, ensuring the design meets best standards and incorporates the following amendments to the design elements as agreed during stakeholder consultations:

- The road design and construction is to be extended from the original 3.6 miles of priority sections of upgraded road (i.e. Malem to Pilyuul (Section 3), Malem to Utwe (Section 2) and Utwe (Section 1)) to 5.53 miles which will include the road in its entirety (refer Figure 1) and an additional access road.
- The road surface is to be upgraded from the gravel sub-base to asphalt to accommodate the adaptation requirements (i.e. 50 years life span) and erosion and runoff concerns.
- The road lane width is to be reduced from 12 feet to 10 feet per lane, ensuring consistency with FSM standards for road width.
- The design is to include all earthworks, retaining walls and erosion considerations to meet the best standards and to reduce the environmental impacts due to the steep alignment of the road.
- The design is to incorporate areas of historical and cultural importance to ensure these are avoided.
- The rights-of-ways are to be provided to EMPSCO for incorporation into the road design.
- The mitigation actions detailed in the Environmental and Social Safeguards Plan are to be incorporated into both the design and construction phases as appropriate for each phase.
- The design and construction phases should include all utilities and scoping / design work on this will need to be tendered.

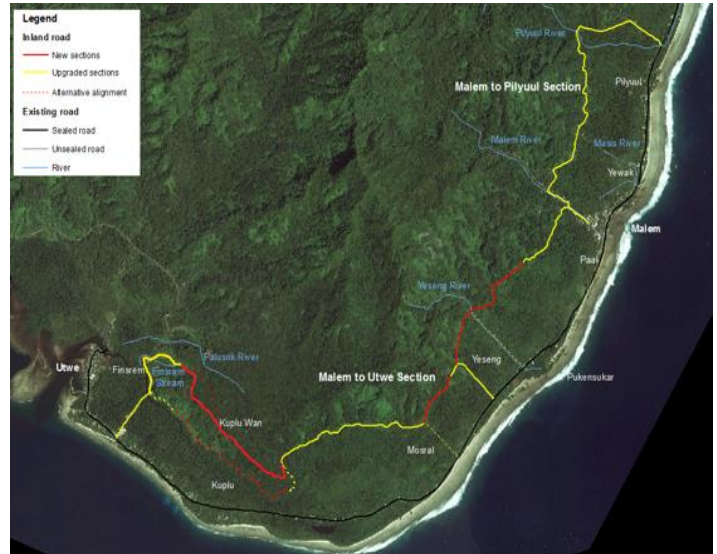
The design approach will ensure the road is constructed around the perimeter of the lower slopes of the volcanic part of the island and above the freshwater swamp or mangrove areas to provide a suitable long-term response to coastal inundation. The inland road will be well above areas likely to be directly impacted by sea-level rise over the next century and beyond (Ramsay et al., 2014). Following the natural contour of the topography minimizes any significant road slopes, need for substantial cut and fill, and reduces erosion potential and land slipping hazard. The intention is that the road, when complete, will be similar to the present inland sections of road, for example between the airport and Tafunsak village (see Figure 8).

The preliminary engineering design report is available at Annex B.

Stage 2 will scale-up the investment under other funding sources to undertake the construction of the road including the establishment of all utilities (i.e. power, water etc). This will also encourage possible movement of the population from the coastal areas to the higher land.



**Figure 6: Priority sections of the development of the inland road on Kosrae (as identified in the Kosrae Shoreline Management Plan)**



**Figure 7: Alignment of inland road between Utwe and Malem. The sections in yellow require upgrading and widening of existing farm roads. The sections in red are new sections of road.**



**Figure 8: Paved inland road between the airport and Tafunsak village (left) and on the narrow storm berm at Mosral, Malem (right)**



**Figure 9. Areas depicting sections where the road will be constructed, noting the area has been cleared for the survey work to be undertaken**

## **Output 3.2. Transitional coastal protection at Mosral and Paal upgraded for immediate coastal protection**

### **Activity 3.2.1: Coastal protection works**

The Kosrae Shoreline Management Plan identified that over the short-term the effect of sea-level rise on the ability of existing coastal defences to provide a “satisfactory” level of protection is likely to be manageable through, for example, upgrading the level of protection of these existing defences. However, beyond this time the magnitude of sea-level rise is expected to be too great to enable such protection to be effective or affordable other than at locations where there are no other management or adaptation options. The SMP developed a coastal defence strategy identifying:

- Long-term defences: a priority on protecting sections of road or other critical infrastructure where there is no other feasible option to reposition away from coastal hazards.
- Transitional defences:

- Upgrading sections of existing defences to provide adequate temporary protection for the road or highly developed areas over the short to medium term to enable longer-term adaptation strategies (such as inland road development) to be implemented.
- Limiting any new sections of coastal defences only to the areas where the road is critically threatened at present (e.g., at Paal and Mosral). This would be undertaken only with a view to provide short to medium term protection

Emergency works were subsequently conducted in response to high tides and waves undermining the road at Paal and Mosral in early 2014. This was an emergency measure involving dumped and roughly placed recycled concrete slabs from upgrading of the runway hardstanding, and at Mosral placement of large concrete filled bags to create a wall. Whilst the emergency works have stabilised the immediate undermining of the road, the *ad hoc* nature of the construction, does not provide an adequate level of protection to the road, with areas still being undermined and the potential for significant damage to occur during storm conditions. The communities of Malem and Utwe discussed this at length during consultations and concluded that given the poor nature of the emergency works that a component of the project to upgrade the emergency defences at both Paal and Mosral was necessary to ensure continued access between Malem and Utwe until the alternative inland road was in place.



Mosral section of Malem road. mass concrete bags, loose boulders, and broken concrete, placed randomly to reduce surge impact and prevent wave overtopping and erosion of road (photo credit: Simpson Abraham, 2015)

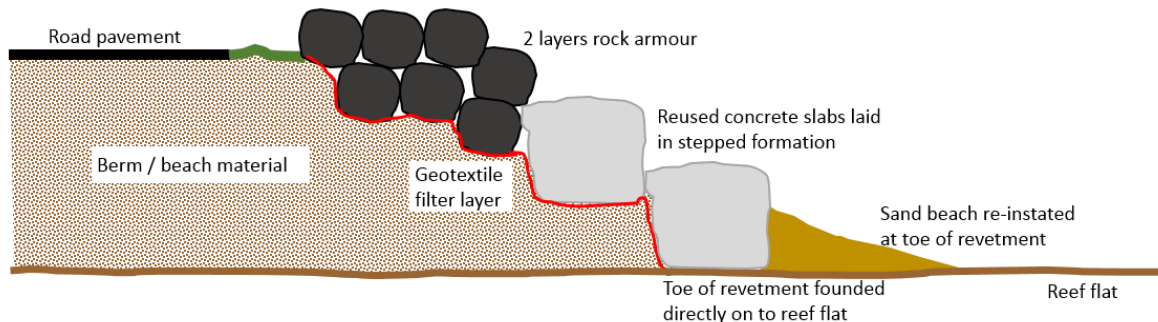


Paal section of the coastal road. Existing dumped concrete rubble. A low reef flat breakwater to 'stabilize' shoreline will also be required further south to prevent outflanking and downdrift erosion. (photo credit: Simpson Abraham, 2015)

At Paal, the design and construction phases will include:

1. Treatment for the outlet channel at Pukensukar including measures on transitioning revetment to the channel and extending the side armour.
2. Determination of the placement and size of the low reef flat breakwater to protect the termination of the revetment.
3. Removal of the existing dumped concrete rubble to enable the underlying sand and coral rubble material to be regraded to an approximately 1:2 slope.
4. Geotextile filter layer will be laid between the underlying material and the armour layer to prevent wash out and winnowing of fine material between the armour layer.
5. The concrete slabs are of a sufficient size to withstand design wave conditions over the reef flat at Paal. These will be reused as the armour layer for the base and lower part of the face of the revetment and will be laid at a slope of 1:2 in a stepped manner.

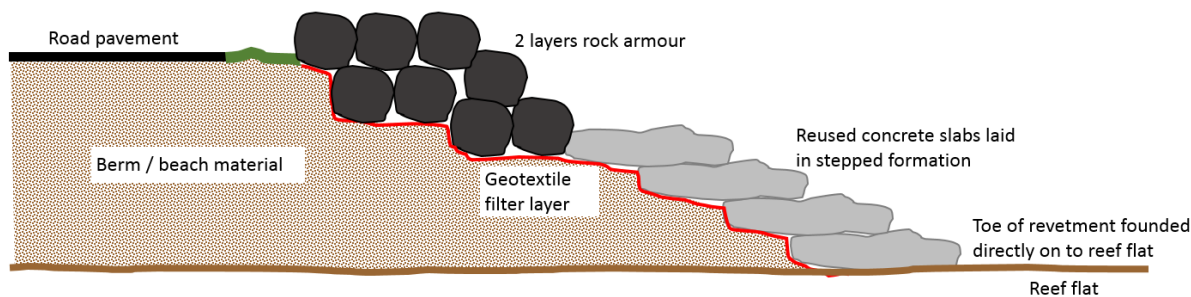
6. There are insufficient concrete slabs to complete the full stepped revetment. Basalt rock armour, sourced from an existing permitted quarry inland between Paal and Mosral, will be used to complete the crest of the revetment. Armour rock will be a minimum of 0.66 m in diameter and will be laid at a 1:2 slope with the crest of the revetment at least 3 rocks wide. The crest of the defence will be above the elevation of the road.
7. At the southern end of the reconstructed defence the revetment the road curves inward with a wider coastal buffer protecting it, with the shoreline position at this location, “held” by a small strand of reef flat mangroves. The revetment will extend behind the existing shoreline at this point to ensure that outflanking and down drift erosion does not occur.



**Figure 10. Cross-section of the proposed reconstructed revetment at Paal**

At Mosral, the design and construction will include:

1. A concrete wave upstand wall to sit behind the top of the revetment.
2. Incorporation of a low reef flat breakwater.
3. Removal of the existing dumped large concrete blocks and rubble to enable the underlying sand and coral rubble material to be regraded to approximately a 1:2 slope.
4. The small stretch of sand beach in front of the existing defence will be stockpiled on the adjacent reef flat and re-instated in front of the reconstructed defence on completion.
5. Geotextile filter layer will be laid between the underlying graded slope and the armour layer to prevent wash out and winnowing of fine material between the armour layer.
6. The concrete blocks are of a sufficient size to withstand design wave conditions over the reef flat at Mosral. These will be reused as the armour layer for the base of the revetment and will be laid to form the base of the revetment.
7. There are insufficient concrete blocks to complete the full revetment. Basalt rock armour, sourced from an existing permitted quarry inland between Paal and Mosral, will be used to complete the crest of the revetment. Armour rock will be a minimum of 0.66 m in diameter and will be laid at a 1:2 slope with the crest of the revetment at least 3 rocks wide. The crest of the defence will be above the elevation of the road.
8. At the southern end of the reconstructed defence the revetment there is potential for down drift erosion to occur and outflanking of the defence. To prevent this, the slope of the revetment will be constructed at a shallower slope and the armour rock used to construct a wider and flatter toe on the reef flat. This will ease the transition from defence to beach and prevent any exacerbated erosion on the coastline immediately to the south.



**Figure 11. Cross-section of the proposed reconstructed revetment at Mosral**

The Executing Entity (DECEM) will be responsible for ensuring the activities associated with the coastal protection works will be undertaken in line with the Project's Environmental and Social Safeguards Plan (ESMP) including ensuring the appropriate Environmental Impact Assessments are undertaken. The design and construction of the coastal protection works will be supervised by the Department of Transport, Communication & Infrastructure's Project Unit to ensure the highest technical and engineering standards are met. In addition, a maintenance plan for the on-going maintenance of the coastal protection works is to be developed and resourced by the Government of Kosrae. This maintenance plan will be required to be submitted to the Executing Entity and Implementing Entity as part of the design work.

#### **Watershed protection and vegetation buffer zones**

To complement the hard engineering solutions, soft adaptation measures i.e. watershed protection and vegetation buffer zones will be incorporated into the coastal protection measures. This will include communities in Kosrae developing, implementing and monitoring native vegetation buffer zones along sensitive areas where roads, rivers and coastline meet. The community will:

1. re-plant endemic vegetation around river and stream areas at road crossings, and along the coastal zone; and
2. develop community gardens along road easement strip to stabilise cleared land; and
3. raise awareness about the importance of soft adaptation measures in protecting coastlines, communities and assets including sustainable use of upland areas, catchments, waterways, swamp and mangrove ecosystems.

### **Component 4: Knowledge management for improved water and coastal protection**

***Outcome 4: Capacity and knowledge enhanced and developed to improve management of water and coastal sectors to adapt to climate change***

**Output 4.1: Resource materials developed, tailored to local context, translated, published, and shared amongst various stakeholders**

**Activity 4.1.1: Undertake knowledge management, communication, and engagement activities**

Activity 4.1.1 establishes the knowledge management (KM) platform for the Project, and will lead the KM, communication, engagement and outreach activities designed to raise awareness,

increase uptake of the facilities and services, tools and information, and promote behaviour change, decision-making, and learning amongst the Project beneficiaries. This activity will coordinate across all components and activities to build and communicate the Project's results and information outputs into appropriate formats for the audiences identified in the knowledge management, communication, and outreach strategy. This involves:

- i. The development of strategies and objectives designed to maximise the dissemination and adoption of applied knowledge produced by the Project;
- ii. The creation of content (key messaging and storytelling) that engages stakeholders and inspires them to utilise the knowledge and practice into their decision-making;
- iii. The production of resource materials and practical information products for the Project beneficiaries and broader advisory communications for external stakeholders. These materials will promote visibility of the project, and could include project briefs, brochures, booklets for leaders, pamphlets in English and local languages targeting the communities, and success stories that are shared through national and regional newsletters;
- iv. The utilisation of participatory forums and activities, including outer island sites, which demonstrate the Project's knowledge and models in action;
- v. In conjunction with the project personnel, the building of relationships with key networks and programs which are trusted by stakeholders as credible sources of knowledge and insight;
- vi. The establishment of mechanisms and channels for high-impact delivery and sustain knowledge into practices beyond the life of the project; and
- vii. Utilise existing distribution networks such as SPREP's Pacific Environment and Information's Network (PEIN); the Information's Resource Centre, the Pacific Climate Change Portal ([www.pacificclimatechange.net](http://www.pacificclimatechange.net)); and the Pacific Disaster Net ([www.pacificdisaster.net](http://www.pacificdisaster.net)).

A Knowledge & Communication Officer will be employed to lead the knowledge management, communication, and engagement activities with additional expertise to be contracted as needed to provide strategic advice and guidance, and training as required.

#### **Activity 4.1.2. Capture and document data and information generated by the project**

The project will, through this activity, develop a project communication and knowledge management strategy that will guide and ensure the project is visible to partners and stakeholders and the work that they do. It will also guide the capturing, development, production, and dissemination of knowledge products of the project.

The data and information generated, lessons learnt, and best practices of the project will be captured and developed into products that will be peer-reviewed, scientifically edited and published in journals or online and through existing government and regional publication series. The project will learn from the knowledge management process of the PACC project where a Technical Series and Experience Series<sup>33</sup> was established, published, and shared online and in hard copies where possible.

The activity will involve the SPREP INFORM project and engage local expertise on data management to capture, store and collate data and information from across the Project activities.

---

<sup>33</sup> The PACC Technical Report Series and the Experience Series can be found online at <https://www.sprep.org/pacc/publications>. The products can also be found by searching within the regional climate change portal, <https://www.pacificclimatechange.net>; and the SPREP Information Resource Center and Pacific Environment Information network <https://www.sprep.org/pacific-environment-information-network/pein>

Data and information including metadata, pictures, sound recordings, maps, videos from ground truthing assessments, technical surveys, consultation workshops, reports carried out will be captured and stored. This will be used during the monitoring and evaluation elements of the project to measure results of the project against its strategic results framework.

## B. Social, Economic, and Environmental benefits

The project is expected to deliver a set of targeted and interlinked economic, social and environmental benefits, as well as serve as a model for future replication throughout the four States of FSM in other sectors (e.g. food security, marine resource management). The project will promote a set of innovations, together with partner institutions/organisations, that will help create better living conditions for the outer island and coastal communities of FSM.

The project will be implemented in the six outer islands namely Woleai and Eauripik in Yap State, Satawan and Lukunor in Chuuk State, and Nukuoro and Kapingamarangi in Pohnpei State. The project will also be implemented in the Malem and Utwe communities of Kosrae. The relevant demographic details of the villages collected throughout the planning stages are given in the tables below. The key indicators for improved water and toilet access are given below in percentage per household. The figures include the average percentage of households in outer islands.

**Table 6. Relevant demographics of Eauripik and Woleai (Yap State)** (Source: 2010 Census)

	Eauripik	Woleai	Total
Population	114	1,039	1,153
Male	45	469	514
Female	69	570	639
Households	18	85	103
Source of drinking water, % per household	Improved <sup>34</sup>		99.5
	Not Improved <sup>54</sup>		0.5
Toilet facility - % per household	Improved <sup>35</sup>		24.7
	Not Improved <sup>55</sup>		75.3
No. of Rubber/Plastic Water Tanks	13	67	80
No. of Concrete tanks	0	8	8
No. of Concrete wells	6	55	61

<sup>34</sup> 'Improved' includes sources from public water supply, community water supply, household tank, protected well, bottled water, and household water tank. 'Not improved' is water truck, rivers, lakes, springs and other sources of drinking water. (source: Divisions of Statistics, SBOC, FSM, 2014)

<sup>35</sup> Improved includes flush toilet, water sealed and ventilate improved pit. 'Not improved' are not-ventilated-improved pit, any 'other' form of toilet and not having a toilet (source: Divisions of Statistics, SBOC, FSM, 2014)

**Table 7. Relevant demographics of the two outer islands of Chuuk State, Satawan and Lukunor**

	Satawan	Lukunor	Total
Population	692	848	1540
Male	360	446	806
Female	332	402	734
Households	97	119	216
Sources of drinking water, % per household	Improved <sup>54</sup>		94.7
	Not Improved <sup>54</sup>		5.3
Toilet facility - % per household	Improved <sup>55</sup>		34.2
	Not Improved <sup>55</sup>		65.8
Rubber / Plastic Water Tanks	Incomplete information. Will be assessed in ground-truthing assessment activities		
Concrete tanks			
Concrete wells			

**Table 8. Relevant demographics of the two outer islands of Pohnpei State, Kapingamarangi and Nukuoro**

	Kapingamarangi	Nukuoro	Total
Population	350	210	560
Male	179	107	286
Female	160	108	268
Households	60	36	96
Sources of drinking water, % per household	Improved <sup>54</sup>		98.4
	Not Improved <sup>54</sup>		1.6
Toilet facility - % per household	Improved <sup>55</sup>		55.2
	Not Improved <sup>55</sup>		44.8
Rubber / Plastic Water Tanks	Approximately 60 units of various water holding mechanisms on island	-	-
Concrete tanks		-	-
Concrete wells		-	-

**Table 9. Relevant demographics of the two outer islands of Kosrae State, Malem and Utwe**

	Malem	Utwe	Total
Population	1300	983	2,283
Male	663	458	1,121
Female	637	525	1,162

Households	224	169	393
Sources of drinking water, % per household	Improved <sup>54</sup>		92.4
	Not Improved <sup>54</sup>		7.6
Toilet facility - % per household	Improved <sup>55</sup>		98.3
	Not Improved <sup>55</sup>		1.7

The vulnerable groups expected to benefit from this project include:

**Women, Men and Youth:** The 2010 Census identified domestic chores and responsibilities at the domestic level in households in FSM as being undertaken largely by women and youth. About 85-90% of the population reside in low-lying coastal areas in volcanic islands such as Kosrae, and 100% in the low-lying targeted atoll islands of Yap, Chuuk and Pohnpei which are highly exposed to extreme climate events. Women and children are highly vulnerable to climate hazards and their impact. The proposed interventions in Yap, Chuuk and Pohnpei that address water with indirect benefits to food security will target and support young and elderly women and youth to adapt as the climate changes.

Ultimately, approximately 6,616 inhabitants of Kosrae are likely to benefit from the intervention measures proposed (direct or indirect benefits) in Component 3. The specific and immediate and daily beneficiaries will be the Malem and Utwe municipal village communities. According to the 2010 Census, the Malem population was 1,300 with males 663 and females 637 and the number of households at 238. The Utwe population stood at 983 on the 2010 Census and was composed of 458 males and 525 females. Twenty three percent of the Utwe population is of high school age. Indirect beneficiaries include: (a) approximately 90 people employed who require daily access to go to and from the only high school located in Tofol and the government administration district in Tofol; (b) approximately 100 people who reside in Walung Municipality. Walung village community has no access to the main roads of the island with boat travel therefore the main use of transport to travel to Tafunsak. The only road from Walung to the rest of Kosrae is via Utwe and ultimately this will be the only road to Walung as the road south from Tafunsak is now suspended due to the Yela area being protected. Accordingly, there are two out of five villages reliant on the road access as the only connection to the rest of Kosrae including the health services, high school, government centre, airport, and port.

**Business owners and general local consumers**

Kosrae: It is anticipated that the livelihood benefits shall include the creation of over 450 employment opportunities across these communities, involving coastal protection engineering support and monitoring, and community engagement/business diversity opportunities. For example, through hired labour in the municipalities for vegetation clearing, manual labour on road construction, provision of services, such as aggregate and rock armour from local quarry operators and local contractors to support the Department of Transport and Infrastructure (DTI). Micro-finance renovation loan schemes such as Palau’s successful Renewable Energy Subsidy Loan program would be one of the programmes that the project will learn from and how it may assist homeowners and landowners in eventually relocating to the new inner road development. Water lines will be installed at the same time as the new road is constructed, followed by electricity and telecommunication lines in the next stage. The eventual relocation of the road will build economic resilience by providing an assurance to business by enabling them to migrate inland and away from the coastal hazardous zones. Furthermore, the proposed road will improve access

to key agroforestry areas around the lower slopes of the volcanic parts of the island increasing potential for food security and agricultural development.

Yap, Chuuk, and Pohnpei: Stabilization of water and food production before, during and after extreme events will make available more nutritional and balanced food at affordable rates. This will allow the more vulnerable and poor populations of the outer islands to better sustain their self-sufficient supply of food, water, and rich-protein food more consistently over time.

### Communities in Outer Islands

The communication and awareness raising activities will engage local and national media and will also target all beneficiaries in the island communities, reaching out to different generations of the country. In addition, the information and training sessions on climate change impacts and adaptation measures for the outer islands will also target a large percentage of the outer island population and be gender focused. For the purpose of the project, the term “gender” will focus on men, women and children, including the elderly and people living with disabilities who are living in, and deriving an income from, the strip of land along the coastal zone. The project would emphasize the specific gender-differentiated roles of women and children.

In summary, the main social, economic, and environmental benefits from the project are given below, compared to the baseline scenario.

**Table 10. Social, Economic and Environmental Benefits for the outer islands of Yap, Chuuk and Pohnpei**

Type of Benefits	Baseline Scenario	Key Benefits
<b>Social</b>	Lack of outer island development plans addressing climate change impacts	Community mobilized, organized and trained for improved management of water resources, sanitation and health practices
	Lack of island water resource management plans incorporating climate and disaster risks	Capacity is built to work collectively for water security, water management, climate change risks and vulnerabilities
	Lack of leadership quality to address issues relating to natural resource management and climate change related issues	Specific training will be offered related to water rainwater harvesting systems repair, maintenance, and cleaning of water assets (tanks, gutters, downpipes, and first flush diverters)
	No trained personnel on water conservation and management practices, health and sanitation including water harvesting systems maintenance and care	Specific training on pilot scale sanitation options that can be replicated and scaled up in other islands and communities
	‘Dependency’ approach to development with high reliance on diminishing US Compact funds for development (ending in 2023).	Specific training on water, sanitation and health practices and monitoring and survey skills targeting women and youth

<p><b>Economic</b></p>	<p>Costs of health treatment and services are high for treatment of water and vector borne diseases (hepatitis, polio, jaundice, crippled, salmonella bacteria, E-coli boils, sores, infections in ears and eyes, protozoa, giardia, vomiting, runny stomach, no energy, roundworms, whip worms).</p> <p>Access to hospitals, loss of income, and medical costs are very high for isolated communities on the outer islands.</p> <p>Low income from crops and capture fishery due to depletion of fishery resources from algal blooms resulting from use of lagoons and seas as toilets.</p> <p>Loss of income and livelihood assets from drought (loss of crops, agriculture fields) as a result of prolonged days with no rain.</p>	<p>Reduced health problems due to improved access to clean water and sanitation.</p> <p>Reduced health costs as a result of availability of sufficient, safe potable water</p> <p>Employment in rainwater harvesting repairs and maintenance, community water tank maintenance</p> <p>Employment in construction of pilot sanitation projects during and after the life of the project</p> <p>Sustained income from maintenance of water and sanitation systems in schools and community governing council properties.</p> <p>Reduced loss of livelihood assets like farms and agriculture fields from drought, cyclones, storm surges, sea level rise and high waves</p> <p>Reduced cost of health services to the communities</p>
<p><b>Environmental</b></p>	<p>Eutrophication of lagoon side during low tides as a result of using lagoons as toilets</p> <p>Less dissolved oxygen available in lagoon and mangrove areas leading to incidences of suffocated fish and other marine life</p> <p>Algal growth boosted around lagoon and mangrove areas as a result of excessive nutrients from human waste</p> <p>Dead fish wash up on shore during very low tide events on the lagoon side</p>	<p>Restored areas of lagoon side waters, increasing aesthetic appeal and ecosystem services</p> <p>No pollution of groundwater and underground to the reef from wastewater from improved sanitation systems</p> <p>No pollution of surface water and lagoons from human waste</p> <p>No excessive drawing of water from groundwater and wells allowing groundwater replenishment for plants and animals and improving the atoll ecosystems during droughts and after cyclones.</p>

**Table 11. Social, Economic, and Environmental Benefits for Beneficiaries of Kosrae State**

Type of Benefits	Baseline Scenario	Key Benefits
<b>Social</b>	High risk of communities being cut off from access to capital and utilities (power, water, electricity, hospital,	Increase coastal resilience to inundation and erosion benefiting approximately 2,283 inhabitants of Malem and Utwe

	<p>main high school, port, airports) and loss of land.</p> <p>'Dependency' approach to development with high reliance on a diminishing US Compact funds for development (ending 2023).</p>	<p>Participation of women, men and youth in decision making processes ensured</p>
<b>Economic</b>	<p>Economically poor, low to non-existent level of agricultural labour, highly reliant on imported foods. In addition, labour is also only on a seasonal basis</p> <p>Low-cost but high-risk random bouldering seawall construction along high-risk coastal road areas</p> <p>High risk to assets, safety, and livelihoods from unprotected exposure to risk of natural disasters</p> <p>High risk to infrastructures during cyclones and other natural disasters</p> <p>Eroding/disappearing beaches negatively affects tourism potential</p>	<p>Employment in coastal protection works, and community-based ecosystem management activities for families in the project villages.</p> <p>Reduced loss to income, time and stress as a result of continued access to key utility services on island (water, electricity, telecommunications, hospital, ports, schools, safety (police))</p> <p>Lower risk as a result of coastal zone protection measures.</p>
<b>Environmental</b>	<p>Frequent sea water inundation of coastal environment as a result of breaches of coastline from king tide, high tide events as well as storm surges</p> <p>Saltwater inundation on coastal environment and plantations and residential areas</p> <p>Lack of community-based ecosystems management practices at community level to manage ecosystems in lowland and upland areas</p>	<p>Coastal protection is strengthened to protect the coastal road and land, from water over topping, overwash, inundation and severe erosion.</p> <p>Protection of coastal areas from cyclones, erosion</p> <p>Limited inundation and overwash as a result of the transitional coastal defences</p> <p>Road design considers improvements to drainage and erosion controls, to prevent water logging from flash flooding, sediments entering waterways and erosion.</p>

Indirect environmental benefits are also expected to accrue from the project, especially under Components 2 and 3. First, the project will utilise the available rainwater to the best possible extent for plants (crops, trees) and animals (livestock, local species). Second, improving water quality maintenance and tank water protection for utilisation in dry conditions. Third, preventing water runoff by improving (repairing, installing new) catchment areas, as well as wastewater control would be helpful to minimise soil erosion, improve soil water holding capacity, minimise excessive nutrient runoff, and maintain soil quality and fertility. Fourth, as further outlined in the Environmental Impact Statement (refer original project plan Annex 4a) and cost benefit analysis summary report (refer original project plan Annex 6) developing a watershed management strategy for the upland areas in Kosrae, will help maintain the biodiversity in the upland ecosystem by prohibiting agricultural activities and other development activities that will harm the environment.

**Table 12. Key Social, Economic, Environmental Benefits from the project, at the output level**

OUTPUT	Key Benefits (Direct)		
	Social	Economic	Environmental
<b>Component 1. Strengthening policy and institutional capacity for integrated coastal and water management at national, state levels and outer islands</b>			
Legislation and policy paper to guide regulation of climate resilient coastal and marine management	Adaptation legislation, policies, and plans recognize the social imperatives and risks of the communities in outer islands and municipalities	Greater certainty for local businesses to scale up to meet the expected needs for future infrastructure and adaptation measures.	National legal standards for application country wide, especially in relation to water quality and sanitation management in coastal areas.
State regulations for development projects amended to consider climate change risks and resilience	Protection of the most vulnerable communities, especially women, youth and the disabled.	Contractors and other businesses will have clear guidance on the need to consider climate change risks in engineering designs and infrastructure	Better management of the local coastal and marine environment by developers and setting aside areas (such as mangroves) that need to be protected.
National Water & Sanitation Policy developed	Policy recognizes the susceptibility of outer island communities to drought, El Niño, and typhoons and cyclones	Economic benefits of reduced health costs, lost workdays, damaged fisheries, and staple crops	National guidance on the principles to be followed for sustainable water access and sanitation practices
National Water Outlook and Water Sector Investment Plan	Proactive and systematic planning at the municipality levels for farmers, fisher folks, women, youth based on sound climate and water information	Concerted and targeted investment for cost-effective and efficient responses from partners and stakeholders to water related crisis	Environmental benefits of sustainable water resources management and coordinated investment plans on water and sanitation infrastructure.
<b>Component 2. Demonstration of water security and sanitation measures in outer islands of Yap, Chuuk and Pohnpei</b>			
Climate change adaptation plans	Women, men and youth involved in decision making on managing their own island resources	Targeted and directed support by partners to reduce damage to outer island assets and infrastructure	Effective reduction in loss and damage to ecosystems caused by climate change and extreme weather events.
Water harvesting and storage systems installed in 6 islands	Plenty of good quality water, sanitation and health benefits for women and men of the islands in atoll during climate extreme events (drought, post cyclones, etc.).	Reduced cost of shipping in water during long dry spells	Pressure on underground water is reduced and is replenished for benefit of the natural ecosystems

Improved sanitation systems established	Improved health and sanitation with tangible quality of life benefits, particularly for women and children	Cost-saving on water purchases, especially during droughts. Reduced loss of fish catches due to pollution of lagoons.	Reduced water pollution, improved quality of groundwater, and possibility of composting sewage sludge.
Trained stakeholders on water conservation and management	Skilled and resourceful community members to respond to and address urgent water needs	Cost-saving on water purchases, repairs to water storages and rainwater catchments	Improved environmental management of coastal ecosystems
<b>Component 3. Demonstration of Kosrae Inland Road Relocation Initiative</b>			
Design of 3.6 miles (5.8km) of inland and access road routes	All residents of Malem and Utwe will eventually be able to commute to and from the capital and where services are provided (government, business district, hospital, port, airport, schools, etc.).	The road will provide access to economic opportunities for several thousand residents and save on boat operating costs for those who currently have no road access.	Design considers mitigation of impact of road on catchment drainage pathways, avoiding inundation and flash floods impact on the environment and residential areas
Transitional coastal protection at Mosral and Pal upgraded	Allows for immediate to future commute by all Kosrae commuters, in particular access by Utwe to and from central business district	Reduce cost and pressure on project to hasten construction and relocation of the road.	Protection of coastal areas from inundation and severe coastal erosion.
Community-based ecosystem management strengthened	Knowledge and skills at the municipality level to be able to manage changes of the natural environment, ecosystems from development in the short to long term		Protected watershed areas and managed development of upland and coastal areas to minimize environmental impacts and maintain ecosystem services of the natural forests and mangrove areas
<b>Component 4. Knowledge management for improved water and coastal protection</b>			
Resource materials developed	Knowledge and information captured and shared for replication and upscaling to other island communities and secure future support for adaptation. Dissemination of information country wide.	Resource materials on adaptation technologies, water resources management, and sanitation can help local businesses gear up for new business opportunities.	The resource materials should identify specific environmental protection measures that can be implemented in FSM to protect coastal resources and ecosystem services.
Stakeholders brought together to share, learn and exchange	Knowledge, awareness, and skills developed for communities to be able to undertake	By reaching out to and coordinating local businesses, and providing start up	All residents in FSM's coastal zones stand to benefit from the lessons learned from this

	implementation, monitoring and future planning of concrete adaptation activities for their islands, homes, and environment	employment, local communities can avoid expensive outside services when small scale repairs and maintenance are needed	project. By bringing them together online or in person, stakeholders can learn and adopt successful adaptation approaches in their home communities.
--	--	--	--

As may be seen from above, implementation of the project will not cause any negative social and environmental impacts. Outer Island communities and municipalities have been consulted in the design of the project components which are in line with the prevalent regulations, policies, and standards of National and State governments. Components proposed under the project have been designed and / or updated in full consideration of the Social and Environmental Policy of the Adaptation Fund (refer Annex C).

### C. Cost-effectiveness of the Proposed Project

**Component 1** focuses on mainstreaming climate change at the national and state levels, through operationalizing the policy and planning processes for infrastructure, water, and sanitation services. **Component 2** focuses on increasing access to (and storage of) good quality water and assessing and piloting sanitation options. The benefits of these activities are expected to reach over 3,250 individuals either as direct or indirect beneficiaries, across the six selected atolls during the project.

The per capita cost of the water security activities (Component 2) will be high given the inherent demographic (low population density) and geographical (distance to outer islands is only accessible by boat) nature of FSM, as in other Pacific island countries. The costs are justified, however, as the interventions address immediate to long-term needs and are sustainable. The activities under **Component 4** will invest in knowledge management that will ensure sustainability, replication and up scaling of programmes and activities.

The cost effectiveness of the project based on the component outputs of the project for Components 1 and 2 only is given in the following table (Table 13). The cost effectiveness of **component 3** activities is outlined separately below.

**Table 13. Cost effectiveness of the project for Components 1 and 2 only**

Current addressing mechanism	How is it addressed by the Project	Cost Effectiveness
<b>Component 1, Output 1.1:</b> Legislation and policy paper to guide regulation of climate resilient coastal and marine management at national level		
FSM has a national climate change and disaster risk management policy. The Strategic Development Plan (SDP) provides for the macro-economic framework and the policies for each sector; the sector planning matrices; and the Infrastructure Development	Development of a national and or state legislative framework, legislative draft that identifies and recognizes the social, economic, and environmental imperatives to FSM’s future development.	The legislative framework/draft will introduce climate resilient factors into its environmental governance and development frameworks. In particular, it will assist FSM’s SDP and IDP 2016-2025 in their governance aspects.

<p>Plan (IDP). Of the four states, only Kosrae and Pohnpei have SDPs.</p> <p>FSM does not have legislation either at the national or state level to enact climate resilient management of its coastal and marine resources.</p> <p>With the exception of Kosrae State, there are no laws and regulations at the national level to protect and conserve FSM's coastal and marine resources from business as usual development. Only Kosrae has a climate change law, climate change policy, climate mainstreamed Regulation for Development Projects 2014 and EIA Guidelines</p>	<p>The project may not be able to achieve the final endorsement of a law on management of its natural resources, as there is likelihood it will be beyond the scope (time) of the project.</p> <p>The project, however, will develop a legislative framework / draft that will direct the national and state governments to initiative legislative and regulatory work to guide and govern its resources. The national government will continue the development of this framework beyond the lifetime of the project.</p>	<p>Greater efficiency and effectiveness of expenditure will be achieved through the clarity and standards provided by a nationwide approach. The legislative framework/draft developed by the project will trigger and push for state governments to develop their own regulations for development projects – similar to Kosrae's RDP 2014 and EIA Guidelines.</p> <p>The project will initiate actions to review, improve, and strengthen the SDP and IDP to ensure developments, especially infrastructure developments along the coastal and marine areas, are climate resilient. All future infrastructure projects will need to be climate-proofed in accordance with the draft legislation.</p>
<p><b>Component 1, Output 1.2:</b> State regulations for coastal and marine development projects amended to consider climate change risks and resilience measures</p>		
<p>With the exception of Kosrae State, existing EIA regulations of Yap, Chuuk and Pohnpei have not yet incorporated climate change and disaster.</p> <p>None of three States have climate resilient regulations for development projects.</p> <p>There is no mechanism to keep development in check with climate resiliency, using environment impact assessment at a minimum. The current practice is largely voluntary and easily ignored.</p>	<p>The project will consult, review, develop, endorse, and promulgate regulations for development projects in each of the three states. It will take on board lessons from Kosrae State under the PACC project the developed and revised the RDP 2014 for Kosrae.</p> <p>The project will look at existing regulations including the EIA regulations and update those regulations to incorporate climate risks and resilience factors to strengthen them.</p> <p>The project will advocate that the regulations are adopted, institutionalized, and applied to any development in the each of the States.</p>	<p>Long -term contribution of the project to the ongoing development of climate change environmental monitoring and governance at national and state levels</p> <p>Opportunity of government stakeholders to review their existing regulations, policies, and practices in light of climate change factors.</p>
<p><b>Component 1, Output 1.3:</b> State Water Outlook and Water Sector Investment Plan developed and implemented</p>		
<p>FSM has a framework for a policy but does not have a policy on water and sanitation. It has</p>	<p>The project will incorporate climate risks and resilience factors into the State's Water</p>	<p>The Plans will enable the water plans at the State level to be</p>

<p>institutionalized the framework but has made no progress on developing and finalizing a policy.</p> <p>There is no outlook programme in FSM to inform and assure stakeholders of the availability and distribution of water. This will have a major impact on both the main island and outer island population.</p> <p>There is no mention in the framework of mainstreaming climate change into the policy.</p> <p>The components of the policy proposed under the framework does not incorporate climate risks and resilience, governance and support programs for water and sanitation issues across FSM, including on the highly vulnerable outer islands.</p> <p>There is no mechanism that informs farmers, businesses, or village communities of what El Niño and La Niña will mean for different parts of FSM, and therefore its impact on water resources.</p> <p>Current practices rely on weather information and climate information provided by NASA, NOAA and SPREP. The scale by which information is provided and the time lapse is not enough to prepare and take decisions. This continues to have a detrimental effect on society, the economy (agriculture, tourism) and environment.</p> <p>There is poor consideration of investment planning required to ensure sustainability of services of the water sector throughout FSM and across its islands.</p>	<p>Outlook and Water Sector Investment Plans.</p> <p>The project will attempt to link its work under other outputs to the policy. Activities under Components 2 and 4 will be incorporated into the implementation of the Plans.</p> <p>The project will work in partnership with NOAA, NASA, SPREP Climate Change Centre through its Pacific Meteorology Desk to develop climate and weather-based products that inform scenarios of water availability on account of rainfall, temperature, wind, extreme weather events, and ENSO. It will also work to develop the capacity of local stakeholders to understand the early warnings provided by global partners and translate them into meaningful and timely avoidance actions.</p> <p>The project will develop a water sector investment plan that FSM can prioritise costed actions for water and sanitation in each state and at all island levels – main, lagoon and outer islands.</p> <p>The project will improve institutional capacity for monitoring and support for action on findings from the water investment planning workshops</p> <p>The project will consider in the plans the need to acquire external financial assistance to meet its safe water and sanitation goals to build resilience of the water sector to climate change impacts</p>	<p>better streamlined into development work.</p> <p>The policy will enable climate change adaptation programmes for water, food, health, and sanitation to be formally considered and addressed not only by government but by its development partners.</p> <p>Through avoiding duplication and maladaptation, the Policy will ensure that all water supply and sanitation projects are climate-proofed and cost-effective.</p> <p>The project will contribute to developing products tailored to sectors (tourism, agriculture, transportation, etc.) that will inform choices for the different development sectors.</p> <p>The project will create a shift in paradigm by building individual and systematic capacities of the local institutions, to develop the outlook products. This will increase the sustainability of the national water outlook beyond the life of the project and cost-effectiveness of future projects.</p> <p>The plan will produce prioritised and costed actions for water and sanitation in each state and at the island level including all islands – main, lagoon and outer islands.</p> <p>The plan will minimise costs for future water supply upgrades by maximising the use of existing assets as far as possible, and respond to its human capacity development needs</p> <p>The plan will build on lessons and best practices gathered from the water demonstration</p>
---	---	--

<p>FSM lacks human capacity development that is needed for integrated water resource management and sustainable water supply solutions.</p> <p>The States are unable to systematically upgrade and utilize their existing assets for the supply of water in a sustainable manner across all islands (main, lagoon and outer islands)</p> <p>FSM lacks an investment plan at state level to be able to manage internal finances and acquire external financial assistance to meet safe water and sanitation goals.</p>		<p>activities in the six outer islands of the project. It will help inform and develop the investment plan, particularly in strengthening the outer island components of the plans. The plans will also ensure the effective use of resources based on informed and evidence-based decision making.</p>
---	--	---

**Component 2. Output 2.2:** Water harvesting and storage systems (WHSS) installed in six atoll islands

<p>Almost all households in the outer islands have water tanks that are either in very poor condition or are not used at all. Often there are water tanks but very poor or no rainwater harvesting systems. Nearly 40% of the tanks in the outer islands of Woleai and Eauripik do not have proper rainwater harvesting systems.</p> <p>Nearly 90% of water wells had very low water levels, all brackish and all uncovered.</p>	<p>Repairing of existing rainwater harvesting systems.</p> <p>Training of women, men and youth on maintenance and cleaning of existing systems.</p> <p>Establishing maintenance schedules with families / households.</p> <p>Building community tanks to alleviate pressure on individual household water tanks during drought.</p> <p>Ensure minimum 2 tanks per household / 2 community tanks per island to serve maximum 100 population.</p>	<p>Repairing the existing rainwater harvesting systems will be cost-effective as it will utilize existing resources that are currently underutilized.</p> <p>Applying the optimal 2 water tanks per household rule will assist with cleaning of one tank interchangeably while the other is being utilized. The same rule is applied at the community level but for 10,000L capacity, plastic tanks, 2 minimum per maximum population of 100 persons.</p> <p>Communities will be involved in the development of tank maintenance protocols to ensure full community ownership.</p>
--	---	--

**Component 2, Output 2.3:** Assessment of viable sanitation measures for outer islands in Yap, Chuuk and Pohnpei

<p>There are three common types of toilets that exist in the outer islands - flush toilet, water sealed and ventilated improved pit. These toilets use a lot of water that could have been conserved for other use (washing, bathing, watering,</p>	<p>If the communities are willing to try alternative approaches, the most suitable sanitation options will be piloted and assessed over the life-of-the project as part of the monitoring and evaluation scheme. Depending upon the results, scaling up can</p>	<p>Effective sanitation and hygiene reduce health costs by containing and killing pathogens, thus avoiding costly visits to the medical clinic for diarrhoea, yellow eyes, or more serious</p>
---	---	--

<p>etc.). It is also not healthy and sanitary, and the wastewater contributes to pollution and contamination of the underground water, reef, and lagoons. While current practices may be difficult to change, the project will undertake an assessment and pilot of potential sanitation measures in the outer islands which are culturally, environmentally, economically, and socially appropriate.</p>	<p>be implemented under future projects.</p> <p>The second part of the activity involves education and training within the community of WASH principles. The importance of education and awareness-raising of sanitation and hygiene practices is critical in reducing illness.</p>	<p>diseases like cholera and typhoid.</p> <p>As a public health measure, this approach to preventing and avoiding disease is much more cost-effectiveness than expanding medical facilities to treat those who become ill.</p>
---	---	--

The elements of cost-effectiveness and efficiency of the activities under the specific outputs 2.2 and 2.3 are further outlined in the following table (Table 14).

**Table 14. Specific elements of cost effectiveness and efficiency for key activities in Component 2**

Output / Activity	Elements of Cost-effectiveness	Efficiency
<b>Water Harvesting and Storage system</b>		
Household rainwater harvesting system	<p>Increasing the catchment area is the most cost-effective way of ensuring that each drop of rain is collected and stored safely</p> <p>Keeping all elements of the catchment systems clean ensures that there is sustained water supply. Closing the household or community tanks could incur high costs if water has to be imported during a drought.</p> <p>Choosing the right tank size relative to catchment area is a cost-effective approach as it means that rainwater is not wasted if the tank is too small and needless cost is incurred if the tank is too large.</p>	<p>Improving guttering of existing rainwater collection systems ensures that rainwater is collected in the most efficient manner.</p> <p>Collecting rainwater in a household harvesting system is much more efficient than relying on groundwater supplies, especially if they need to be pumped.</p>
Community water tanks	<p>Increasing catchment area is a cost-effective approach to ensure that all available rainwater is collected and stored for daily use and with reserves for drought conditions.</p> <p>Plastic tanks (HDPE) with manhole covers are easy to clean, maintain and moved allowing for use of land for other livelihood activities. Concrete tanks take up more room, cannot be moved, and are harder to clean.</p> <p>Choosing the right tank size relative to catchment area and the community water</p>	<p>An increased number of the same size of tank means that spare parts are easily available and local technicians can be trained for routine maintenance and repair.</p> <p>Plastic tanks are easier to clean versus concrete tanks, but where concrete tanks already exist it may be more efficient to repair and clean them rather than bringing in new tanks,</p>

	demands is the most cost-effective approach.	especially if the available land area is constrained.
<b>Sanitation Options</b>		
Household, Community / school / church / health dispensary unit	Review of current arrangements, public attitudes, and technical sanitation options will uncover the most cost-effective and acceptable sanitation options for each of the project sites.	Sometimes the most efficient sanitation option, such as using the sea to disperse waste, is not the best option from a health and environmental protection perspective. By examining multiple options and experience from other similar atoll communities, the most efficient but least damaging options will be trialled.

The project interventions under Component 2 would result in the following positive externalities:

- The impact of drought and the aftermath of typhoons on water resources have caused migration from outer islands to the main islands. Social impacts of the remaining population on the outer islands include family and community disintegration, health issues for women, and school dropouts. Improved water security and sanitation and health awareness will assist to relieve these conditions over time, especially during drought and immediately in the early recovery phase following cyclones and typhoons. A sustained and efficient water supply is essential to support all livelihood activities including food security, sanitation, and health.
- Improved village and school level organization and training will assist communities to gain confidence and find solutions to their water and sanitation problems. It will improve the willingness to work collectively to address emerging socio-economic and environmental threats due to climate change.
- Water and land resources remain degraded and unproductive in the outer islands. Project investments will directly help to rehabilitate some unproductive areas and ensure that communities can continue to live sustainably there rather than migrating.
- Some concrete tanks that have leaked cannot be repaired including those that have been repaired previously but leak again. The community concrete tanks are too large to maintain and have taken up land that could have been put to better use. Investing in HDPE plastic tanks versus concrete tanks at community level will improve the ability to clean and carry out maintenance. They can also be moved from one location to another, allowing land to be used for alternative purposes. Where the existing tanks can be repaired, however, this may be the most cost-effective and efficient action to take.
- Natural and social systems remain exposed to vulnerabilities. Project investments will improve the community's capacity to improve and manage the local natural resources on a sustainable basis. Alternatives for achieving long-term water storage and efficiency savings were considered. For example, through the consultations, communities considered the following alternatives (table 15).

**Table 15. Alternative Options**

Proposed Activity	Alternatives	Benefits
<b>Water Harvesting &amp; Storage Systems</b>		
<p>Repairing existing rainwater harvesting systems at household / private level, minimal purchase of just one other PVC to allow cleaning interchangeably</p> <p><i>Cost per household including maintenance cost for at least a year comes to US\$560<sup>36</sup>.</i></p>	<p>Construction of new systems per household with two HDPE tanks to allow cleaning interchangeably</p> <p>The cost per household will come to US\$1,120 plus added logistical coverage of about US\$5,000 minimum to import all new equipment required to install and monitor, comes to US\$6,000-\$7,000 per household</p> <p>Install Reverse Osmosis Units. The installation of RO Units has been considered in other Pacific island contexts. While the effectiveness of RO units has been proven in some instances, they are accompanied by prohibitively high purchase installation, and maintenance costs and ownership issues. Spare parts are expensive and difficult to replace in outer islands. Filters have short-life span (6 to 12 months).</p>	<p>Repairing existing systems is less expensive and does not take up land which is in short supply.</p> <p>Using existing facilities requires less construction activity and less maintenance</p> <p>Spare parts are easily attainable and shipped within FSM</p>
<p>Constructing community tanks to serve and alleviate pressure on private systems</p> <p><i>Cost comes to US\$750 per 2,000 gallon, minimum 2 required to serve a minimum population of 100. Total with guttering and down pipes comes to US\$3,000 per tank</i></p>	<p>Construct new systems for all households on all islands of the atoll without need for any community tanks</p> <p>Provision of systems for all will exceed the budget of the project per state.</p>	<p>Community tanks system is less expensive to import, construct, maintain, clean and own</p> <p>2 community tanks / 100 population easier to manage, clean and maintain compared to many household systems without spare parts</p>
<p>An assessment and pilot of potential sanitation measures in the outer islands which are culturally, environmentally, economically, and socially</p>	<p>Ultimately the pilot project could build either of the following:</p>	<p>By not rushing to judgement on which form of sanitation is best in each village, the dangers of constructing sanitation facilities that don't</p>

<sup>36</sup> Capital cost of water tanks in FSM ranges from \$350 to \$750. The project takes the lowest cost, typical cost if a new water tank size is required of US\$350 for 1,000-gallon capacity. US\$210 for repairs and maintenance. The US\$560 is total activity budget for repair activities of Eauripik outer island divided by the number of households. This is used as the baseline by the project. Transportation costs of the equipment are born by the project.

<p>appropriate. Undertaking extensive consultations with the island communities, the Project will assess the current state of sanitation facilities and the appropriateness (i.e. from a population, cultural, environmental, economic, and social perspective) of these facilities. Depending upon the outcomes of the assessments, the Project team will work with the communities to ascertain whether there are other options which could be trialled and whether the community is open to testing other options. The options will be piloted and assessed over the life-of-the project as part of the monitoring and evaluation project. Depending upon the results, scaling up can be implemented under future projects.</p>	<p><b>Bush toilet:</b> this is a hole in the ground with a simple cover around the hole.</p> <p><b>Pit toilet:</b> pit toilets are usually covered with a concrete slab and have a “house” on the slab. The house needs to be moved when the pit fills up.</p> <p><b>Ventilated improved pit toilet (VIP):</b> These are really the same as pit toilets but have a PVC pipe added to improve airflow and reduce flies and smells.</p> <p><b>Water seal:</b> A pit covered with a concrete slab and a concrete toilet seat. A bucket of water is used to flush the waste into the pit.</p> <p><b>Flush/Septic toilet:</b> A porcelain toilet with a water cistern. These require piped water to flush the waste into a concrete septic tank, where solids settle in the tank. The water collects in the tank and then passes out into a “soak”, or straight into the soil and groundwater. The discharged water should be treated in a properly constructed trench to destroy the pathogens.</p> <p><b>Self-composting toilet (SCT):</b> The waterless compost toilet works just like a compost heap for your garden. In the garden compost heap, you mix pig manure with dead leaves and chopped up branches and leave it for a few months until it decomposes and makes a good fertiliser. In the SCT it is human manure instead of pig manure, mixed with leaves and left for at least six months so that all the pathogens are killed by the composting process. Costs are <i>US\$4000<sup>37</sup> per unit x 5 total per outer island, total range in costs US\$25,000 - \$50,000 based on</i></p>	<p>work, create environmental problems, can't be maintained, or possibly not even used, can be avoided. Based on extensive consultation, examination of current traditional knowledge on existing sanitation systems, and careful evaluation of social, environmental, and economic considerations, the best choices can be made. By piloting these choices, again the dangers of excessive outside determinism can be avoided, and the experience carefully monitored and evaluated before recommending expansion and upscaling.</p>
--	---	---

<sup>37</sup> Based on cost of 1 unit built in Nauru A\$4,500-\$5000. Not including transportation and shipping costs to be borne by the project through execution costs and other activity costs

	<i>outer island distance of shipment of materials</i>	
--	---	--

The PACC programme delivered a similar set of activities to those proposed for this project. The terminal evaluation of PACC found that that the community driven and managed interventions “successfully....reduced water insecurity through better catchment regularity and retention; rainwater tanks and roof catchment systems”. Results were more mixed with solar purifiers, especially those targeting individual households. The evaluation also acknowledges the relatively high cost of increased water availability achieved by the project, though does not provide a reference baseline. Given the geographic location, decentralized and often non-existent water supply systems, a relatively high cost for provision of water in such environments is to be expected.

Alternative options are either very expensive or socially unacceptable to the outer island communities and against local and World Health Organization health and sanitation standards. The major advantage of the proposed project as against alternative options is its ability to provide sustainable livelihoods through increased provision of enough safe drinking water not only for human consumption but also for plants and animals. The project, therefore, is environmentally sound and socially acceptable. It addresses the immediate threats faced due to drought, sea level rise, typhoons and cyclones, as well as future impacts expected from climate change.

In summary, the following key characteristics of the project, particular to Components 1 and 2, that would considerably enhance its cost effectiveness:

1. The major Component 2 activities of water harvesting, and storage systems and installation of self-composting toilet programs are highly replicable under similar outer island environments and conditions
2. The implementation mechanism by involving experienced NGOs, intergovernmental organizations such as IOM, and linking with the Micronesian Challenge (MC) to strengthen the state and community ownership and achieve high level of local ownership is highly cost-effective. These organizations have been very active during the planning stages of this proposal and very involved with work in the outer islands.
3. Being cost-effective, government departments would convince interest in up-scaling of the project through various programmes such as those under IOM and MC.

Under **Component 3**, a detailed cost-benefit analysis study<sup>38</sup> has been completed for the proposal to construct and operate an inland road from Malem to Yeseng to Utwe. A copy of the cost-benefit analysis study is provided in the original project plan (Annex 6). The main purposes of the study were to:

- 'ground-truth' whether the inland road development is a priority investment (strategic rating of 8.9/10) as stated in the State's Infrastructure Development Plan (IDP), Volume 4 of the FSM IDP (DTCI 2015);
- inform how the design of the inland road development can be refined and improved; and

---

<sup>38</sup> The cost-benefit analysis study was supported through the Pilot Program for Climate Resilience: Pacific Regional Track (PPCR-PR) - a regional program which aims to strengthen integration of climate change and disaster risk considerations into 'mainstream' planning and related budgetary and decision-making processes (i.e. 'climate change and disaster risk mainstreaming'). The PPCR-PR is being implemented by the Secretariat of the Pacific Regional Environment Program (SPREP) and the Asian Development Bank (ADB) and is funded through the Climate Investment Fund (CIF). More information on this program can be found at <https://www.climateinvestmentfunds.org/cif/node/7295>

- further develop the evidence-base needed to support funding applications for this infrastructure investment.

The cost-benefit analysis examined the proposal to construct and operate an inland road from Malem to Yeseng to Utwe. This option includes 20 years maintenance and revetment of the existing coastal road in order to provide time for households to relocate to safer areas, as is the intention of the proposed Inland Road Relocation Initiative (IRRI).

The analysis also examined an alternative option to upgrade the existing coastal road, including elevating it and ramping segments that are particularly exposed to erosion and over-wash.

A wide range of cost and benefit categories for each option were considered, reflecting the many dimensions of coastal hazard risks faced by Malem and Utwe coastal communities and of relocating communities and infrastructure inland. A summary of these costs and benefits for each infrastructure option is provided in Table 16 below.

**Table 16. Summary of cost-benefit analysis results (PV\$ @ 4% discount rate)**

	Inland road development Phase 1: Malem to Yeseng to Utwe	Upgrade existing coastal road: Malem to Yeseng to Utwe
<i>(1) Costs</i>		
establishment and operational costs, including awareness programs	5,846,667	5,307,444
impacts on inland environment from inroad development	Not valued	0
impacts on coastal environment from upgrading existing coastal road	0	Not valued
	5,846,667	5,307,444
<i>(2) Benefits</i>		
avoided clean-up costs from coastal flooding events	15,576	12,192
avoided damages to cars	Not valued	Not valued, but lower than inland road option
avoided damages to home gardens	Not valued	Not valued, but lower than inland road option
avoided damages to housing infrastructure	177,472	91,742
avoided damages to road infrastructure	278,375	1,517,936
avoided trauma and loss of life from major typhoon event	Not valued	Not valued, but lower than inland road option
avoided income losses associated with road damages (preventing access to workplaces)	1,452	1,185

avoided disruptions to schooling	Not valued	Not valued, but lower than inland road option
avoided disruptions to accessing hospitals	Not valued	Not valued, but lower than inland road option
increased food production achieved through improved access to inland areas	2,446,134	0
other benefits (e.g. tourism and cultural) achieved through improved access to inland areas	Not valued	0
migration out of Kosrae and associated economic implications	Not valued, but lower than upgrading coastal road option	Not valued
Avoided replacement of coastal road at existing design standard	3,194,855	3,194,855
Avoided maintenance of existing coastal road	22,580	22,580
	6,136,444	4,840,490
(3) NPV = (2)-(1)	289,777	(466,954)
(4) BCR = (2)/(1)	1.05	0.91

As can be seen from Table 16, the quantitative results show that only the inland road option is expected to generate net benefits for the Malem and Utwe communities - relative to the status quo scenario - whereby the existing coastal road is retained at its current design specifications and a protective rampart (revetment) constructed to protect sections of the road most exposed to over-wash.

The CBA report also emphasizes that a number of important costs and benefit categories were not valued due to a lack of data, and hence are not reflected in the quantitative results. These costs and benefit categories include:

- benefits of the inland road relating to (i) avoided damages to cars and home gardens; (ii) avoided trauma and loss of life from major typhoon events; (iii) avoided disruptions to schooling; (iv) avoided disruptions to accessing hospitals; and (v) a range of other benefits expected to be generated from improving access to inland areas (e.g. tourism and culture);
- environmental costs of upgrading the existing coastal road, especially in terms of downstream coastal erosion; and
- broader economic implications relating to outmigration from Kosrae if the existing coastal road is maintained or upgraded.<sup>39</sup>

When these categories are taken into account, the inland road option would be expected to show a much stronger return on investment and represents a worthwhile use of resources. The social and environmental impacts will also be avoided, minimized, reduced through the proper application of the mitigation factors outlined in the Environmental Social and Management Plan (Annex C).

---

<sup>39</sup> households located seaward of the coastal road have advised they will leave Kosrae if their safety remains compromised.

The CBA report further stresses that a number of other (non-public-infrastructure related) barriers are constraining households' capacity to relocate to inland areas - and that these barriers will need to be addressed if the infrastructure investment is to fully realize its intended objectives.

Key barriers identified as part of community consultations were a lack of access to finance (e.g. to construct a new house) and a lack of access to land located upland. Moreover, if households are slow to relocate inland, then the Government will likely be required to re-establish the coastal road - when it meets the end of its economic life in approximately 20 years' time. This would represent a substantial additional cost for the Government - in the order of US\$3.4 million. This reinforces the need for complementary measures to address non-infrastructure-related barriers to relocation.

The key findings and conclusions outlined in the CBA report are consistent with the recommendations made in the Kosrae Shoreline Management Plan (2014). The key findings have also been peer-reviewed by different stakeholders, including technical officials from SPREP, the Pacific Community (SPC), German International Co-operation Agency (GIZ), and the National Institute of Water and Atmospheric Research (NIWA).

Based on the CBA results, the Inland Road Development - Phase 1 Malem to Yeseng to Utwe is confirmed as a high priority investment for Kosrae. Moreover, the CBA results suggest that this project should be pursued ahead of some other infrastructure projects ranked higher than in the Infrastructure Development Plan 2016-2025. One example is the Lelu water systems improvement project for which a CBA study was also completed and shown to be economically unviable.

The project will not be able to fully fund Phase 1 of the inland road development, which is the establishment and operational costs, including awareness programmes with a total cost of US\$5,846,667. The remaining allocation of US\$9 million under the AF for FSM will not suffice the concerted implementation of all components of the project. Component 3 alone constitutes 47% of the total project activity costs. The Kosrae State Government with assistance of the National FSM government continues to pursue discussion with development partners to support implementation of Phase II of the inland road development. The Government has confirmed this commitment through a letter to the AF Board dated 8 July 2016 (refer Annex 8 of the original Project Plan).

**D. Consistency with National Strategies**

This project is based on National and State Government policies and strategies as outlined in the table below.

No.	National / State Government Policy, <i>responsible agency</i>	Project elements consistent with the policy
1	Nationwide Climate Change Policy <i>Department of Environment, Climate Change &amp; Emergency Management (DECCEM)</i>	Developing legislation and regulation frameworks for climate resilient development in coastal and marine areas Developing climate resilient water and sanitation policies Implementing water outlook program to prepare and manage water resources in advance of climate

		variability and changes
2	National Strategic Development Plan	<p>Protection, conservation of freshwater, marine and terrestrial ecosystems, inland road relocation, coastal protection from erosion, training, and awareness of CC, SLR, vulnerability, issues and causes of increasing hazards.</p> <p>Developing climate resilient regulations for development projects – to ensure developments at the coastal areas are climate-proofed.</p>
3	Nation Wide Integrated Disaster Risk Management and Climate Change Policy <i>DECEM</i>	<p>Cross-sectoral climate change coordination mechanisms within office of environment and emergency management at national level, state environment protection agencies.</p> <p>Preparation of outer islands against onset of El Nino periods that bring long dry spells.</p> <p>Training of outer island communities on water and sanitary monitoring and other disaster preparedness and response measures</p>
4	Kosrae Climate Change Act <i>Kosrae State Government</i>	<p>Cross-sectoral climate change coordination mechanisms amongst Kosrae State Government departments and utilities</p> <p>Abide with regulations for development projects requirements to meet EIA guidelines and standards</p> <p>Apply climate change hazard mitigation actions to protect society and the environment</p>
5	Kosrae Shoreline Management Plan <i>Kosrae Island Resource &amp; Management Authority (KIRMA)</i>	Implementing the first priority of the shoreline management plan under the Inland Road Relocation Initiative (IRRI) program
6	KSG Regulations for Development Project <i>KIRMA</i>	Abide by regulation rules and requirements under the project
7	Kosrae Strategic Development Plan, <i>Office of Development Assistance</i>	<p>Mainstreaming climate change into development through design and construction of roading infrastructure</p> <p>Revetment of existing coastal roads to prolong the shelf life of the roads from sea level rise and resultant tidal surges, king tides and extreme high tide events.</p>
8	Pohnpei State Strategic Development Plan <i>Pohnpei State Government</i>	<p>Integrated water resource management in the outer islands helping to conserve safe drinking water.</p> <p>Implementing simple and effective wastewater treatment technologies such as self-composting toilets. It does not use water, but it effectively decomposes off of wastewater in environmentally friendly set up.</p> <p>Constructing potable water source facilities in outer islands that will provide significant support to environmental improvement and economic growth on main island.</p>

9	National Infrastructure Development Plan (NIDP) <i>Ministry of Transport, Infrastructure and Communication</i>	Implementing cost-effective, safe, reliable, and sustainable infrastructure (environmentally sound and climate proofed) Implementing high priority infrastructure needs of the states that is submitted to national government under guidance of the NIDP
10	National Climate Change and Health Action Plan <i>Department of Health</i>	Reducing incidences of water and vector-borne diseases in outer islands / hard to reach places. Building capacity of women, men and youth to better water, sanitation and health conditions and assets on island through trainings, survey assistance, construction and carrying out monitoring roles
11	Kosrae Shoreline Management Plan, <i>KIRMA</i>	Implementing the priority strategy identified by the KSMP
12	Yap Joint State Action Plan, <i>Department of Resources &amp; Development</i>	Implementing the water goals for the outer islands
13	National Framework on Water and Sanitation Policy	Integrated water resource management helping to conserve water Optimize water use by increasing water use efficiency by at least 20% Enhancing storage, both above and below ground, special effort to increase water storage capacity
14	"Endorsing Access and Right to Safe Drinking Water and Sanitation in the Micronesia Region" - Micronesian Traditional Leaders Conference	Providing access to safe drinking water and sanitation in the outer island regions of Micronesia Providing training and awareness amongst the women, men, and youth of the outer islands Building capacity of the traditional leaders, island governing councils to manage climate change adaptation projects relating to water, sanitation and health
15	Second National Communication Report to the UNFCCC	Providing water and water tanks to outer islands immediately including improving food security by provisions of water to plants and crops
16	National Biodiversity Strategy and Action Plan	Carry out a community-based ecosystem management program with municipal communities Work with leading NGOs to carry out monitoring and surveying of ecosystems
17	National Action Plan to Combat Land Degradation	Develop and implement water shed protection strategies. Build capacity of communities to lead and manage community-based ecosystem management programs.
18	Joint National Action Plan for climate change adaptation (CCA) and disaster risk management (DRM) (developing)	Carry out coordination mechanisms at national and state levels involving the national office of environment and emergency management, state EPAs and departments of resources and development and

		department of transport, infrastructure, and communications
19	National Environmental Policy Act of 1969	Protection, conservation of freshwater, marine and terrestrial ecosystems, inland road relocation, coastal protection from erosion, training, and awareness of CC, SLR, vulnerability, issues and causes of increasing hazards. Developing climate resilient regulations for development projects – to ensure developments at the coastal areas are climate-proofed.

## E. Technical Standards

The overall objective of the Project is in line with the Climate Change Policy of the FSM Government 2009, the Framework for National Water and Sanitation Policy 2011, and the Infrastructure Development Plan 2016-2025. At the state level, the Climate Change Act 2011 and the Regulations for Development Projects 2014 and EIA Guidelines 2014 of the State of Kosrae as well as adhering to the recommendations of the Joint Strategic Action Plan on Climate Change and Disaster Risk Management of each State, will apply. Also, the Project will be governed by the policy and preference of the Government of FSM in adherence to all the specific local criteria. Apart from that, the project would also adhere to the recommendations communicated by FSM's Second National Communication report 2015 to the UNFCCC relating to climate change adaptation benefits.

The National Government provides guidance and technical assistance to the States when needed and requested on matters related to planning, economic development, natural resources, fisheries, and the environment.<sup>40</sup> The National Climate Change Policy of 2009, for instance, provides guidance related to infrastructure as follows:

### Adaptation

- a. All development activities in FSM to take into account projected climatic changes in their design and implementation as stipulated in the FSM Strategic Development Plan/Infrastructure Development Plan (SDP/IDP); and
- b. To use ecosystem-based approaches where applicable.

### Technology Transfer

- a. To optimize the use of local technologies where available;
- b. To identify technology that is locally appropriate; and
- c. To enhance easy access to, and sustainable use of new technologies

### Finance

- a. To maximize the use of local resources through establishment of sustainable financing mechanisms to support adaptation, mitigation, and resource management initiatives.

<sup>40</sup> Federated States of Micronesia State-Wide Assessment and Resource Strategy 2010-2015+. Undated. p. 10. <http://www.wflcenter.org/islandforestry/fsm.pdf>

The involvement of the key stakeholders in the technical teams, working committee and project steering committee will ensure compliance with policies, guidance, and laws. The monitoring of compliance to technical standards, where applicable, would be done at field level units by the Outer Island Project Working Committees for Yap, Chuuk and Pohnpei, and by the Kosrae Island Resource Management Authority (KIRMA). SPREP as RIE and DECEM as EE would monitor the adherence to the technical standards during periodic field visits.

Table 17 provides a summary of the key activities and the applicable standards that are applied by the relevant government department supporting the project.

**Table 17. Applicable standards applied to project activities**

No.	Activity	Applicable Standards	Application to Project by:
<b>Component 1: Strengthening policy and institutional capacity for integrated coastal and water management at national, state levels and outer island</b>			
1	Legislative framework and draft	Apply normal procedural standards in draft legislation and replicate lessons from Kosrae State Climate Change Act (refer to further description below)	Division of Litigation, Department of Justice
2	State regulations for development projects	Apply normal procedural standards in draft legislation and replicate lessons from Kosrae State Regulations for Development Projects. (Refer to further description below)	Offices of the Attorney General Yap State, Chuuk State, Pohnpei State
<b>Component 2: Demonstration of water security and sanitation measures in outer islands of Yap, Chuuk and Pohnpei</b>			
3	Rainwater harvesting systems	Minimum standards of the Rainwater Catchment Design and Installation Standards (ARCSA, 2009) State EPA Regulations Climate Adaptation Guide for Infrastructure 2014	Environment Protection Agency – Yap, Chuuk and Pohnpei States
4	Self-composting toilet programs constructed	Sustainable sanitation manual and guidelines for a waterless composting toilet (SPREP, 2007) State EPA Regulations Climate Adaptation Guide for Infrastructure 2014	Environment Protection Agency – Yap, Chuuk and Pohnpei States
<b>Component 3: Demonstration of Kosrae inland road relocation initiative</b>			
5	Survey and design road and related infrastructure to	Design standards for Kosrae circumferential road extension	Department of Transport,

	ensure climate change resilience	project. Standards cover the road pavement design, and associated structures such as drainage, bridges, culverts, and rock revetment for coastal protection – ADB 2005	Communications & Infrastructure
		Engineering design standards: subsurface conditions, material specifications, cross section and standard dimensions and drainage and erosion – ADB 2011	Department of Transport, Communications & Infrastructure
		Non-engineering design standards: maintenance planning and early warning, land use planning, community-based ecosystems management – ADB 2011, KSG (KIRMA) 2015	Department of Transport, Communications & Infrastructure, Kosrae Island Resource Management Authority
6	Coastal protection works	Refined coastal defence design guidelines and design criteria developed during associated activities related to the development of the original Kosrae Shoreline Management Plan in 1998-2000. <i>Manual on the use of rock in coastal and shoreline engineering</i> (CIRIA/CUR, 1991	Department of Transport, Communications & Infrastructure
	For both road design and coastal protection works	Climate Adaptation Guide for Infrastructure 2014	Department of Transport, Communications & Infrastructure
<b>Component 4: Knowledge management for improved water and coastal protection</b>			
10	Key stakeholder participation	IDP strategic consideration of 'Involvement of States'	DECEN, State EPA and R&D offices, KIRMA
11	Generation of evidence-based learning	SNC Report adaptation recommendations, National Climate Change Policy suggested benefits	RIE, DECEN
12	Sharing of learning	Government protocols for participation in learning sharing events	DECEN, State EPA offices, R&D office, KIRMA
13	Development of knowledge products	Knowledge standards established by SPREP and other agencies	SPREP and DECEN

FSM does not have a formal building code. At present projects are generally designed in accordance with international codes, standards, and guidelines, but with only limited account taken of the specific circumstances of FSM. Some guidelines have been developed for specific aspects including seismic and wind loading and are summarized in Climate Adaptation Guide for Infrastructure. FSM through the Department of Transport and Infrastructure, under the guidance of the IDP 2016-2025, plans to develop a National Building Code with State specific requirements where appropriate. The Code will be based on the International Building Code and other US based

codes and standards but will also take account of the requirements of FSM and incorporate existing state and national guidelines.

Without any national or state level rainwater catchment design and installation standards, the project will attempt to apply and meet minimum standards of the American Rainwater Catchment Systems Association (ARCSA) and the American Society of Plumbing Engineers (ASPE) based on its Rainwater Catchment Design and Installation Standards manual (ARCSA, 2009). The standard will be applied to new rainwater catchment installations, alterations, additions, maintenance, and repairs to existing installations. The standards are designed to assist engineers, designers, plumbers, builders, developers, local government, and users in safely implementing a rainwater catchment system. The environmental norms (water quality) notified with regards to rainwater harvesting systems, will be in conformity with the pollution norms outlined under each state of the State Environmental Protection Agency regulations.

## **F. Project Duplication**

The project target areas are not the focus of any other climate change adaptation initiatives. In fact, this is the first, focused effort to implement a climate change adaptation project based on identified priorities on the ground in these remote and vulnerable islands of Yap, Chuuk and Pohnpei. In Kosrae state, this will be the second time a project will be focused on climate-proofing roading infrastructure, but a first time on the southern and most vulnerable coastlines of Malem and Utwe. The first project was a pilot project, that was successfully demonstrated under the PACC project in the northern coastline of Tafunsak from 2009 – 2015<sup>41</sup>.

This project would be the first to explicitly focus on improving water security as an adaptation strategy in the selected outer islands of FSM. The protection and preservation of ecosystems (lagoon and mangrove areas) and reduction of incidences of water and vector-borne diseases are complementary adaptation measures of the project. It will complement ongoing government programmes that are being implemented to improve outer island water resource management, agricultural productivity, and conservation of biodiversity. The project will take required measures to avoid potential fund duplication with other funding sources for similar activities. Some of the potential schemes/programmes of Government that have complementary components are outlined in Annex D.

## **G. Learning and Knowledge Management**

The Project proposes a dedicated component to improve and strengthen knowledge management services, communication and engagement, and working with Project members to support the capacity building activities at the State and outer island level (i.e. training, awareness and information sessions). Knowledge management and communication, while focused in Component 4 for budgetary purposes will be a central, cross-cutting element across all activities.

A cornerstone of communication, engagement and outreach for the Project is participation. Component 4 will provide a systematic approach at the country level to improving understanding on climate change impacts on water and coastal zones. In doing so, the goal is to enhance and activate participation of key stakeholders to address the risks and challenges of climate change in the coastal sector in a holistic manner.

---

<sup>41</sup> See Technical Report No.18 <https://www.sprep.org/pacc/publications/technical-reports>

The Project's Knowledge Management & Communication Strategy will seek to promote improved understanding of climate change impacts and adaptation measures to build resilience through a coordinated effort to promote behaviour change, decision-support, and learning. The Strategy will guide the Project's design, development, dissemination and uptake of tools, information products and training materials generated from activities to the target stakeholders. It will include key messages, stakeholder analysis, tools and tactics including a set of indicators to monitor and evaluate effectiveness.

The knowledge management and communication component will be responsible for the development and dissemination of project outputs to the appropriate stakeholders and will be involved in the development of training materials, plans and manuals. Any lessons learned from the dissemination and uptake of the outputs to the stakeholders will be captured through progress reports, field reports and the ongoing monitoring and evaluation. Information products, tools and training materials will be translated into English and the local dialects to be cognizant of the cultural diversity of the outer islands of the project.

### **Data Management Systems**

Knowledge and understanding are important for driving and bringing about informed decision making. The project, "Building National and Regional Capacity to Implement Multilateral Environmental Agreements by Strengthening Planning and the State of Environmental Assessment and Reporting in the Pacific", referred to as the Inform project, recognises the need for this data-driven decision making. The project has established a Pacific island network of national and regional data repositories and reporting tools to support the monitoring, evaluation, and analysis of environmental information, which supports environmental planning, forecasting, and reporting requirements.

The Project will work closely with the Inform project, of which FSM is a partner, to utilise the established FSM knowledge management system to record, store and enable access to all data and information generated by the Project.

### **Lessons learned**

The Project will capture lessons learned and good practices through various mechanisms including:

- The project design to phase the adaptation measures i.e. provision of water storage and harvesting across the six outer islands provides for adaptative management and learning process to be continually fed back into the Project's implementation and planning across all of the outer islands.
- The active participation of stakeholders in decisions relating to climate change impacts and adaptation measures e.g. water security, coastal protection enables stakeholder buy-in and ownership to the Project and the outcomes.
- The Project's monitoring and evaluation approach provides for real time monitoring and continual capturing of information which can be fed back into the Project to improve implementation of activities.
- Each component and activity will capture and feedback any lessons and good practices into the implementation of the Project.

## H. Stakeholder Consultative Process

The stakeholders of the project include local community, traditional community leaders, municipal government council, NGOs; research institutions such as the College of Extension Services of Micronesia; women’s councils; sub-regional organizations such as the Micronesian Challenge and International Organization for Migration, and government agencies such as the departments of Environment (EPA), Office for Internal Affairs, Planning & Budget, Resources & Development, Youth and Social Affairs, Transport & Infrastructure and Communications.

The stakeholders identified and consulted during the Project Planning and in the Project implementation phase are outlined below.

State	Community	Government	NGOS & IGOS
National Government	- n/a	Vice President of the Federated States of Micronesia Secretary (Minister) of the Department of Foreign Affairs (NDA of AF) Secretary of Finance Secretary of Resources and Development Secretary of Overseas Development Assistance Governor and Lieutenant Governors of Yap, Chuuk, Pohnpei and Kosrae United States Embassy of FSM - National PMU, Infrastructure	
Yap State	Village community – Woleai, Eauripik Council of Pilung (Yap Proper) chief leaders Council of Tamol (Outer islands) chief leaders Traditional Leaders and Mayors of Woleai and Eauripik	Office of Internal Affairs (OIA) Fishing Authority (FA) Office of Planning & Budget (OPB) Environment Protection Agency (EPA) Department of Agriculture & Forestry (DAF) Resources & Development (R&D)	International Organization for Migration (IOM)
Chuuk State	Satawan community (Women, men)	DAF EPA	Chuuk Women’s Council IOM

	Lukunor community (Women, men) Traditional Leaders and Mayors of Satawa and Lukunor	ODA R&D College of Micronesia (COM) College Extension Services (CES-COM) College Research Extension (CRE-COM)	
Pohnpei State	Traditional leader (Nukuoro) Women leaders (Kapinga) Chief leader (Pingelap Atoll) Church minister Traditional Leaders and Mayors of Kapingamarangi and Nukuoro	CES-COM CRE-COM Department of Lands and Natural Resources (LNR) Department of Transport and Infrastructure (DTI) FSM Youth and Social Affairs DAF Conservation Society of Pohnpei (CSP) Office of Emergency and Environment Management (OEEM) Pingela Atoll Conservation	IOM Micronesian Challenge (MC) Red Cross Society
Kosrae State	Traditional Leaders and Mayors of Malem and Utwe Malem and Utwe Community Members (e.g. farmers, landowners, fishermen, Council Chairman, bankers, food inspectors)	Governor's Office KIRMA Kosrae Transport, Communication & Infrastructure Kosrae Housing Authority KSG Dept. of Education Dept. of Health Malem Municipal Government Tafunsak Municipal Government Lelu Town Government FSM TIC Kosrae Utility Authority Kosrae State Legislature Dept. of Administration & Finance DREA	Micronesian Challenge Trust (Kosrae Office) Kosrae Conservation Society Organization COM IMO MCT

		Kosrae Land Court DAF Dept. Environment ODA	
--	--	--	--

**Project Implementation Phase:** During project implementation, a number of stakeholder consultations have taken place to ensure stakeholder engagement, participation and buy-in to the Project, and to work with relevant stakeholders to realign the project outcomes, outputs and activities with realistic on-ground expectations. These consultations have been undertaken through inception meetings, State meetings and engagements, outer island community meetings and informal consultations by the Project Management Unit. The list of stakeholders consulted is outlined in the table above. Key outcomes from the consultations are included at Annex E.

Stakeholder consultation during the Project Implementation phase has been twofold:

1. The Project team has undertaken stakeholder engagements to ensure continued inputs from affected communities and participation in activities. In 2019 and early 2020 the team undertook six (6) visits to the outer islands of Yap, Chuuk and Pohnpei. In June 2019, the Yap AF Team visited Woleai atoll to carry out the project inception workshops and conduct an assessment of the atoll's water resources infrastructures. In January 2019, the Pohnpei AF Team visited the Island of Kapingamarangi to introduce the AF project to the island leadership and in May 2019 the team visited again the island of Kapingamarangi and Nukuoro to reaffirm and verify hydro assessments done by the islands Community Coordinators. The Chuuk AF Team visited the islands of Lekinioch and Satawan to carry out the project inception workshop to the community members and undertake a ground-truthing mission for the two islands water resources. A second trip in Chuuk was also conducted in the month of June 2020 to complete the assessment of privately own water infrastructure on the island of Satawan. In the month of April 2020, the Pohnpei team revisited the islands of Nukuoro and Kapinga to carry out water quality tests for the selected water wells and tanks and assess the condition of the selected sites to identify the appropriate designs for improvement. Details of these missions and the stakeholder engagements are provided in the table below.

Island & Date	Purpose of Mission	Stakeholders Consulted
Kapingamarangi (January 22-23, 2019)	Undertake arrangements for water and sanitation technologies, and reaffirm data and recommendations gathered from the consultations during the planning stages	<b>Island Council Members:</b> Bercin Dumm Bethwel Hitapu wae Shelton Lomboi Elwin Mateak Usasi Kaipas Ruy Dick Koisimy Haduet Edesio Hackson Domicy Dugh Kisiro Lick  Mayor, Nathan Maruame

		<p>Kapingamarangi School Principal, Midion Andrew</p> <p><b>SPC RENI Project</b> Sean Kaarard, Project Manager Caleb Gamule, Former Mayor of Kapinga (assistant)</p> <p><b>Pohnpei State Legislature</b> Senator Edgar Likaned, Kapingamarangi Island</p>
Kapingamarangi (June 19 – 26, 2019)	To reaffirm assessment from Kapinga community coordinator and obtained and verify preliminary hydro assessment from Nukuoro community coordinator	Mayor Nathan Ulik A/Mayor, Nukuoro Jaybee Joseph Community Coordinator Community members
Woleai, Yap (June 28 – July 9, 2019)	Woleai Inception and Water Assessment	Chief of Woleai Mwairal Woleai Chiefs Elders Community members in five Woleai communities Woleai Women groups
Chuuk (January 22 – 29 2020)	Assessment of Mortlock region with FSM DECEM in Collaboration with Chuuk State Government and AF project conducting inception workshop	Mayor Traditional leaders Community members
Nukuoro and Kapingamarangi, Pohnpei (April 25 – May 3, 2020)	Ground-truthing assessment on selected project sites on Nukuouoro and Kapingamarangi	A/Mayor Nukuoro Community members
Satawan, Chuuk (June 17-23, 2020)	Continued Assessment of the project site	Mayor, Satawan Community members Edwin Assito, Community Coordinator Church leaders

2. In October 2019, the Implementing Entity undertook a supervisory mission to FSM to work with the Executing Entity / Project Management Unit on aspects of the project which were challenging to implement due to scope, scale and budgetary constraints. Stakeholder consultations focused on the State of Kosrae due to the issues raised on Component 3 involving the construction of the inland road and coastal protection works. The discussions aimed at understanding expectations from the Government and communities, discussing the constraints with the project in meeting expectations, and discussions and subsequent decisions to realign project outcomes, outputs and activities with realistic on-ground expectations. Stakeholders consulted with included:

Name	Ministry / Organisation	Title
Carson Sigrah	Governor's Officer (Kosrae)	Governor
Arthy Nena	Governor's Officer (Kosrae)	Lieutenant Governor
Blair Charley	Kosrae State	Director, KIRMA
Jason Jack	Kosrae State	AF Project - Kosrae OFO
Richard Moufa	Department of Environment, Climate Change and Emergency Management (DECEM)	Project Manager – AF Project
Ymee G Charley	DECEM	AF Project Accountant
Kikuo Apis	DECEM	AF Project Communication Officer
Noel Yagisemal	Yap State	AF Project – Yap OFO
Morthy Solomon	Pohnpei State	AF Project – Pohnpei OFO
Correy Abraham	DECEM	Adaptation Program Manager
Layla Phillip	DECEM	Administrative Officer
Leandro Olano	Kosrae Transport, Communication & Infrastructure	Engineer
Robert Goodwin	National PMU, Infrastructure	Manager
Steven George	HRDA	Executive Director-Kosrae Housing Authority
Andy George	KCSO	Executive Director
Betwin Tilfas	KIRMA	GIS Specialist
Kiobu Luey	KIRMA	Permitting Unit Supervisor
Lipar George	KSG	ODA-Administrator
Raymond Moody	KIRMA	Permitting Unit-Assistant
Rollinson Ned	Governor's Office (Kosrae)	Chief of Staff
Nena William	Disaster-Governor's Office	DCO
Hiron Livae	Dept of Transportation & Infrastructure	Director
Bruce Howell	PMO – Kosrae State	Manager
Tulensru Waguk	Dept. of Education	Director
Arthur Talley	Malem Municipal Government	V.Chairman Council
Abraham Phillip	Malem Municipal Government	Chairman R&D Committee
Kun Mongkeya	Dept. of Health Services	Administrative Officer
Albert Jackson	Tafunsak Municipal Government	Mayor
Presley Abraham	Lelu Town Government	Mayor
Witson Phillip	FSM TIC	FSMTC Kosrae Manager
Fred Skilling	Kosrae Utility Authority	General Manager
Yamado Melander	Kosrae State Legislature	Senator-Utwe Rep.
Rensley Sigrah	Dept. of Administration & Finance	Director

**Project Planning Phase:** Details of stakeholder consultations during the original planning phase are described below. During the planning phase, five rounds of consultative meetings were undertaken with stakeholders including community, government, and NGOs (Annex F).

- Round One (July 2015): Reaffirmed the adaptation priorities of the project from the communities and government against their development plans and priorities to address climate change in the specific sites. These priorities were identified by the State governments during the concept planning stage in 2013 and 2014.
- Round Two (November 2015): The second consultative meeting was to work with the National and Kosrae State Government in securing a development partner to assist in the construction of the Malem-Utwe inland road and access roads.

- Round Three (November 2015): Meeting with the Kosrae State Government and community to establish an Inland Road Relocation Initiative (IRRI) adaptation strategy. The objectives of this meeting were twofold: (i) examine the methodology, results and findings of the completed cost-benefit analysis (CBA) study for the Malem to Utwe inland road component (refer original project plan) and; (ii) develop a Monitoring and Evaluation Framework (MEF) for the project to reduce climate risks faced by the Malem and Utwe communities (refer original project plan). The results of the consultation contributed to the strategic results framework elements of Component 1, 3 and 4.
- Round Four (January–February 2016): Development of MEF for Yap, Chuuk, and Pohnpei addressing water resource management, food security and marine resource management as priorities for adaptation in the outer islands of the states. As a result, three more MEFs were developed which contributed to strategic results framework for component 2. All the findings of the consultative and follow up meetings contributed to framing the strategic results for Components 1, 3 and 4.
- Round Five (May 2016): Environmental Impact Assessment for Kosrae given the potential for risks from the proposed construction of the inland road. The consultations were carried out for both Malem and Utwe communities.

Two sets of follow-up visits and one partnership and due diligence meeting was carried out from November-December 2015, January-February 2016, and June 2016, respectively. These visits included high level government officials such as the Vice President of FSM, Secretary (Minister) and officials of the Office of Overseas Development Assistance, Resources & Development, Finance and Department of Foreign Affairs serving as the National Designated Authority of the Adaptation Fund for FSM. Special attention was paid to Kosrae given the potential risks of the activities under Component 3. As such, follow up meetings with Kosrae included high level state government representatives that included the Governor, Lieutenant Governor, Cabinet members, Speaker and Legislature, Attorney General, the Infrastructure Planning and Implementation Committee (IPIC); and mayors and traditional leaders of Malem and Utwe communities. The follow up visits in Pohnpei also included the United States Embassy to FSM and the College of Micronesia.

## **I. Justification for Funding Request**

The Project aims to enhance resilience to climate change impacts on the vulnerable outer island communities of the Federated States of Micronesia (Kosrae, Yap, Chuuk and Pohnpei). This is being implemented through several adaptation actions at the National, State, and outer island level. The targeted outer islands are remote and subjected to a range of climate and other environmental stressors which have yet to be fully assessed or quantified in a way that the full socio-economic benefits can be determined.

However, it is evident there is a lack of secure water facilities and coastal protection measures in the islands, placing increased pressure on the social wellbeing of the local communities and driving out-migration of working age people, hollowing out these communities. Over the longer term, the ultimate habitability of these islands will be impacted by a combination of broader environmental and social stressors, among which climate change is likely to be the most serious.

The Project aims to maximise the funding amount for concrete adaptation interventions and to provide the support or platforms for these adaptation interventions and their long-term sustainability, responding to government and outer island community requests and priorities.

The design of the four components was largely influenced by results of the consultative engagements undertaken during the project planning phase, and more recently during the implementation phase as outlined in this proposal.

The details outlined below provides justification for the funding requested, focusing on the cost of adaptation reasoning, illustrating the impact of AF funding compared to no funding (baseline) related to expected project outcomes.

Component	Baseline (without AF)	Additional (with AF)
<p>Component 1. Strengthening policy and institutional capacity for integrated coastal and water management at national, state, and outer island levels</p>	<p>There is a lack of integrated implementation of policies and management of resources across the national, state, and outer island levels. For example, the National Climate Change Policy (2009) is implemented at the national level, with only Kosrae State reviewing and strengthening its State legal and regulatory policies<sup>42</sup>.</p> <p>Coastal zone protection and enforcement of existing regulations is undertaken through the EPA (or KIRMA in Kosrae), based on EPA USA regulations. These are not always appropriate or applicable to the State / outer island environment and can be costly to implement. They also require qualified staff and skills that are not available in the outer islands.</p> <p>The States of Yap, Chuuk and Pohnpei do not have state-level policy frameworks or legal / regulatory instruments incorporating climate change risks and impacts. As a result, approximately 95 percent of construction and infrastructure-related developments in the coastal and urban zones are undertaken through a business-as-usual approach.</p>	<p>The original project design did not sufficiently consider the complex political environment of the Federated States of Micronesia including responsibilities for decision-making at the National and State levels.</p> <p>The revised plan prioritises a review of the national and state legislation and policy on water and coastal management and undertaking the development of State water outlooks and water sector investment plans. This focus acknowledges the decision-making on these issues is undertaken at the State level rather than at the National level.</p> <p>The activities will review national and state legislation and regulations and develop guidance for the implementation of recommendations at the sectoral level. This is aimed at strengthening the regulatory approach to incorporating climate change into coastal and water sectors and development requirements. It will also ensure the policy and institutional framework is appropriate and relevant to the conditions in the FSM rather than the more developed US environment. Furthermore, it responds to a lesson learned from the PACC</p>

<sup>42</sup> This was undertaken through the Pacific Adaptation to Climate Change (PACC) project (2009-2014) and guides the regulatory environment for development projects in Kosrae. For example, the Okat Bridge construction in Kosrae (\$12.7m in 2014) was the first development project to apply the regulations.

	<p>There are no management plans at the outer island level to manage water, coastal or marine resources against climate change impacts. Community consultations and scientific studies have indicated the urgent need for water, sanitation, and coastal management plans to maintain and sustain good quality drinking water, coral reefs, and fisheries.</p> <p>A review and assessment of legal and regulatory frameworks and instruments is required to position Government (national and state) to mainstream climate change into the sector development programmes.</p>	<p>project and its terminal evaluation.</p>
<p>Component 2. Demonstration of water security and sanitation measures in outer islands of Yap, Chuuk and Pohnpei</p>	<p>Of the six outer islands, only Kapingamarangi Atoll (Pohnpei) addresses climate change adaptation in the community development plan. A portable water reservoir system is the number one climate change adaptation priority activity for Kapingamarangi according to its 'Utamadua Development Plan' 2015. Other priorities include shoreline erosion prevention, food security and natural disaster preparation.</p> <p>Rainwater harvesting systems are in place on all six outer islands, but are either no longer in use, in poor condition, cannot be maintained or harbour harmful pathogens that carry vector and water-borne diseases. Within one month of drought, some communities must resort to drinking coconut juice to quench their thirst. Stagnant water in water tanks and saline water from wells are used for washing and cooking. Women and youth are required to collect water from neighbours or travel long distances to fetch water from dry and salinized wells. Rainwater harvesting</p>	<p>Investing in repair of existing household and private rainwater harvesting systems by providing equipment, training and establishing maintenance support plans and educating all members of the community will assist in expanding and maintaining a good supply of drinking water that will prove useful during drought periods.</p> <p>This was the highest recommendation from a rapid assessment of water resources in the outer islands of Yap following the drought experienced as a result of the 2015/16 El Nino.</p> <p>At the household level, the project will ensure through its ground-truthing assessment that repair and installation</p> <p>The project will undertake ground-truthing assessments to assess the number of tanks for repair or new installations in the outer islands of Yap, Chuuk and Pohnpei. Initial reviews undertaken in 2019 highlight approximately 42 tanks will be repaired or installed.</p>

	<p>systems often do not have spare parts available on island to assist with maintenance. Concrete tanks and cisterns are no longer supported by the communities as a feasible option to store water. They are difficult to maintain and occupy valuable land on the islands which cannot be used for any development or other purpose.</p> <p>In terms of sanitation, the six islands either have bush, pit, VIP, water seal, flush/septic, or no toilets at all. The islands that do not have any toilet facilities use the lagoon or the ocean side beaches. The safety and health concerns on both the environment (lagoon side beaches, mangrove areas, terrestrial ecosystems) and people (hepatitis, polio, salmonella, e-coli, giardia, roundworms, whip worms, etc.) are therefore a high concern with the Ministry of Health for these outer islands. In times of drought and other climate change impacts, these negative health and sanitary effects have been exacerbated. Other toilets that require water puts pressure on individual family-owned water tanks and therefore compete with washing, cooking and other needs.</p>	<p>Saving water and promoting health and sanitation habits is an adaptation strategy that the project will apply at the individual and household level that is very much required and will become useful when impacts of climate change are at its worse. The project will target the younger generation to build this habit and impact behavioural change.</p> <p>Following lessons learned from previous projects in the Pacific, illustrating SCT are not necessarily viable from a technological or cultural perspective, the Project will undertake an assessment of what will be appropriate for these outer islands prior to installation of any agreed-to options with the communities. The options will be piloted and evaluated prior to any larger-scale implementation.</p> <p>The six target islands of the three States are distant from the main islands where the key government and central business districts are located. Logistics and procurement activities will cost the project significantly, in aspects such as transportation, communications and time. The consultations, and ground truthing social and environment assessments will take time and will require expert involvement to identify and demonstrate adaptive measures which can be undertaken in the islands. practices.</p>
<p>Component 3. Demonstration of adaptation measures for coastal communities in Kosrae State</p>	<p>A full review of the Kosrae coastline has been carried out. The review has led to the development of the Kosrae Shoreline Management Plan 2014 which has since been endorsed by the Governor of the State.</p>	<p>The people of Malem and Utwe community have clearly outlined, reiterated, and repeated the need to implement the priorities identified in the KSMP 2014.</p> <p>Following extensive consultations in 2019 with the National Government (i.e DECEM, TC&amp;I), the State of</p>

	<p>A number of priority interventions were identified and, in following up for upscaling of the PACC project results, all stakeholders (communities, government, NGOs, etc.) agreed to the priority intervention measures of the PACC project be implemented.</p>	<p>Kosrae and utilising information from the upgraded ESM Plan and the road design firm, it was agreed the project would only be able to undertake Phase 1 of the inland road construction in Kosrae.</p> <p>Phase One will design the road to best practice engineering standards, and ensure the mitigation actions outlined in the ESM Plan are in place.</p> <p>The AF project will strengthen and upgrade the infrastructure protecting the shoreline and current vulnerable coastal road from sea level rise, destructive storm surges and coastal inundation in Mosral and Paal. The protection works will undergo a design element and utilise the increase in budget to ensure best practice engineering standards are met, including the development of a Government funded maintenance plan.</p>
<p>Component 4. Knowledge management for improved water and coastal protection</p>	<p>All States of FSM have projects that provide lessons and information only for the project and is largely for visibility of the project during the time of the project. There is no programmatic approach and institutional and systemic capacity program that ensures climate change information continues to be made available and produced for the benefit of the communities and state in water and coastal zone management areas.</p> <p>Yap, Chuuk and Pohnpei have programmes and schemes that promote water conservation but as business as usual and do not have climate change clearly incorporated. Some outer islands, for example, Kapingamarangi have their own community development plans. These address economic and social development, and political</p>	<p>The project engage stakeholders to consult, solicit, and collate views of all stakeholders for the activities. Engagement throughout the project will be guided by the Gender Strategy and Action Plan, which will be significant for the outer islands whereby traditional cultures including decision-making remain.</p> <p>The project will develop knowledge products, data and information for use to improve and strengthen implementation, as well as sharing with other entities and projects to strengthen overall projects within FSM. The products will be shared and disseminated amongst local, state, national, sub-regional and regional levels. The products will be tailored to local context, translated, published, and shared amongst various stakeholders. This will</p>

	<p>reform. Climate change adaptation, however, is only addressed under the economic development section. Climate change is not seen in a holistic manner in these development plans.</p> <p>Kosrae State, during the conceptualising and planning stages of this project, decided on the importance of addressing climate risks in infrastructure plans and community development plans.</p> <p>All islands have resources in English and less in the local context. Traditional knowledge is also not equally captured as the science and social science of the impacts of climate change.</p> <p>The mainstreaming of climate change in national and state curricula is carried out voluntarily and there are no specific and targeted materials that will improve climate education amongst the young and future generations of FSM.</p> <p>Capacity development in terms of training personnel in key sectors of society and the economy on climate change is addressed largely at the project level. There is no programmatic approach to building capacity within the water and coastal sector with the exception of Kosrae for the latter development sector.</p> <p>There is a technology framework that has already been developed and assisted by regional partners of FSM. For example SPREP developed a knowledge management online database through the Pacific climate change portal (<a href="https://www.pacificclimatechange.net">https://www.pacificclimatechange.net</a>). These will be used to store and capture information</p>	<p>allow usability amongst a wide range of audience in the FSM and the Pacific.</p> <p>Lessons learned will be captured and incorporated into ongoing activities and emerging projects.</p> <p>Stakeholders from each of the States will come together to share, learn and exchange knowledge and skills on climate change, adaptation planning, monitoring, vulnerability assessments and climate change. Institutional and individual capacity will be built via training events, lessons and learning workshops of the project. The knowledge and skills built from these workshops will engage the national, state and local teams deliver on the adaptation activities of the project. Exchange visits to sites will be a key part of building knowledge and sharing it as quickly as possible. These will allow exposure to methods, tools, hands-on learning of the various coastal management techniques that are available and being trialled at the different island environments of the project. The project will focus on enhancing two-way communication between scientists and traditional knowledge holders, educating the modern scientists, and appreciating knowledge of the indigenous beneficiaries in natural resource management in the outer islands. The sustainability, relevance, effectiveness, and efficiency of the project will rely on a large part to this component that will complete the bottom-up and top-down approach of the project.</p>
--	---	---

	developed and collected by the project.	
--	---	--

## J. Sustainability

The project will ensure activities implemented are owned by the stakeholders across national, state, and outer islands levels. Furthermore, sustainability of the project outputs will be strengthened through the following avenues.

**Institutional sustainability:** The project paves the way for national and state level governments to sustain and scale-up actions from the project through the development of guidance and regulations which have been requested by government stakeholders and which will be anchored into existing and future ministry and departmental programmes.

The strengthening of legislation, regulations, and policies at the national level to address and respond to climate change impacts on coastal and water sectors will impart two sustainability benefits. Firstly, from a bottom-up approach, it will strengthen FSM's stance on responding to climate change threats as a nation, contributing to the region's solidarity efforts to mainstream climate change and disaster risks into its development. FSM's position and stance on enhancing resilience will attract development and bilateral partners to invest in a climate resilient development for FSM. As a result, it will help implement its goals under the Paris Agreement and set a process of mainstreaming climate into policy, to achieve its intended nationally determined contributions under the UNFCCC. It will, at the same time, sustain support of the top-down benefits as a result.

Despite the autonomous governance at the state level, national legislation will channel support and resources to protect and conserve the nation's natural resources, and promote climate resilient development of its people, at the capital and outer island communities.

State regulations for development projects will support national legislation and implement best practices, replicated from the Kosrae example. Future development such as infrastructure projects, along the coastline of the main islands as well as the outer islands will need to comply with these regulations. Policy and guidance documents that will be identified, and/or those existing, are linked to these regulations and will help development partners and those providing technical assistance to FSM, to comply.

The National Water and Sanitation Policy will strengthen the work of the National Water Task Force. This Task Force will be able to continue its work through proper training, institutionalisation of processes, and implementation of components of the policy. These include the Water Outlook Programme and Water Sector Investment Plan. The latter plan is a sustainability plan in place for investment in the water sector of FSM. It will be the platform that all stakeholders, including development partners, will need to work from in providing technical and funding assistance, resources, and services to the water sector. The project will work to mainstream climate change into the investment plan to ensure future investments in the water sector are climate resilient.

**Economic sustainability:** Investing in increasing the resilience of vulnerable communities through asset investment is a sustainable economic approach. It will reduce the future costs related to droughts and resulting health issues from poor quality drinking water and inadequate

sanitation. The rainwater harvesting and storage systems will provide increased storage, which is essential for drought conditions. Furthermore, the systems will be made resilient to climate change by locating community tanks in safe localities around the islands. The individual household water tanks will allow serviceability of one while the other is being used. This is useful when drought is expected, and one other tank provides the sustenance. There is also reasonable chance of one of the tanks surviving a typhoon/hurricane. The minimum of two x 10,000 L HDPE tanks per island population of 100 has been calculated to suffice the community with safe drinking water. Again, when one other tank is being emptied and cleaned, the other tank maintains the supply, easing the pressure on individual family water tanks. HDPE plastics are known for stiffness, strength, toughness, resistance to chemicals and moisture, permeability to gas, ease of processing, and ease of forming. They can therefore withstand high temperatures and salt spray conditions. The project will ensure these assets are sheltered, secured, and protected.

In response to accelerated sea level rise within the next 10-20 years, the ground-truthing assessment that will be carried out will determine the location where the tanks will be safe from threats of erosion, king tide high wave impacts, storm surges, wave overtopping and over washing

**Environmental sustainability:** The national and state policies and strategies, as well as the on-ground concrete adaptation measures, will consider environmental impacts as documented in the Environmental and Social Management Plan (ESMP). All the project's proposed interventions are designed to be environmentally sustainable. For example, the water harvesting systems focus on providing rainwater to supply water to the people in an effective and sustainable manner, without relying on the thin groundwater lens which is often contaminated or saline. Furthermore, the policy and planning activities outlined in Outputs 1.1, 1.2 and 1.3 will emphasise environmental sustainability, thus helping engage stakeholders at the national, state, and outer island levels in working with environmental aims in mind.

**Financial sustainability:** Financial sustainability is essential to the continued operations and maintenance of the adaptation measures applied in this project. By ensuring that local communities are fully consulted and trained in simple repair of water supply and sanitation systems, there is less need for expensive maintenance and repair services from the capital.

Under Component 3, Kosrae coastal protection works, the Government of Kosrae will be responsible for the development and subsequent resourcing of an ongoing maintenance plan and schedule. This will be an expected deliverable from the activity.

**Replication and Scaling up:** The institutional arrangement for implementation of the project is based on the institutional capacity and its operational mandate given by State and National Government. This will help to synergise the project outcomes in future plans and policies of the Government. Based on the data and analysis that will be undertaken during implementation, the viability, sustainability, and replicability of the model will be tested. The approach taken in relation to sanitation is extremely important as it avoids top-down dictation of technologies that may not be workable under the outer island conditions, where land is at a premium. Through extensive consultation, evaluation of current arrangements, and piloting new approaches, the optimum approach can be realized, thus avoiding maladaptation and waste of scarce financial resources, and allowing upscaling in other outer islands in FSM and other Pacific island countries.

The capacity of the executing entities at national, state and municipality/outer island levels has been designed to allow for future, similar programmes to be operationalized. The institutions, that include Working Committees, department management units on water, sanitation, infrastructure construction will synergise these works in future plans and policies of the Government. In Kosrae,

the project is already considering replicating the climate-proofing of road infrastructure. It will continue to build on expanding the capacity of individuals that started with the PACC project. The situation is similar for water-related projects of Yap, Chuuk and Pohnpei. The project is already learning lessons from the GCCA:PSIS project and has incorporated these lessons into its design. The project design has learned to plan around the difficult transportation and logistical schedules with the Department of Transportation when organizing shipments of equipment and services to the outer islands.

The process documentation and evidence-based assessments and studies, gathered from monitoring activities as well, will provide the necessary information to develop peer-reviewed information and knowledge products that users, including academic institutions, policy and decision makers at all levels, will capitalise on and enable wider replication of success stories from the project.

## K. Environmental and Social Impacts and Risks

An overview of environmental and social impacts and risks identified as relevant to the project is summarised below. A more detailed and activity-based assessment of potential risks and impacts is provided in the project's Environmental and Social Management Plan (Annex C), including an assessment of Adaptation Fund Safeguard Policies and their applicability to the Project.

An initial safeguards screening was undertaken in 2016 and was subsequently audited in July 2019 where several discrepancies between the AF ESS Policy and assessment were identified. Updated screening was undertaken in 2019 in accordance with the AF ESS policy and the policy guidance document. The updated ESMP is the safeguard instrument for the FSM AF project's technical and physical investments.

SPREP also implements all projects according to their own Environmental and Social Safeguards Policy through a series of 'Environmental and Social Standards'. As an Implementing Entity for AF, SPREP has audited and updated their ESS in 2019, to ensure that they comply with and fully encompass the AF policy.

The table below identifies which of the Adaptation Fund's ESP Principles are not triggered by this project and therefore require no further assessment, and which Principles are triggered require additional assessment and/or management through implementation of the ESMP.

Checklist of environmental and social principles	No further assessment required for compliance	Potential impacts and risks – further assessment and management required for compliance
<i>Compliance with the Law</i>		√
<i>Access and Equity</i>		√
<i>Marginalized and Vulnerable Groups</i>	√	
<i>Human Rights</i>		√
<i>Gender Equity and Women's Empowerment</i>		√
<i>Core Labour Rights</i>		√
<i>Indigenous Peoples</i>		√

<i>Involuntary Resettlement</i>		√
<i>Protection of Natural Habitats</i>		√
<i>Conservation of Biological Diversity</i>	√	
<i>Climate Change</i>	√	
<i>Pollution Prevention and Resource Efficiency</i>		√
<i>Public Health</i>		√
<i>Physical and Cultural Heritage</i>		√
<i>Lands and Soil Conservation</i>	√	

Below is an outline of the assessment of the Adaptation Fund ESS Principles against project activities including risk identification.

<b>AF ESS Principles</b>	<b>Applicability to Project</b>
<p><b>Principle 1: Compliance with the Law</b>  <i>Projects/programmes supported by the Fund shall be in compliance with all applicable domestic and international laws.</i></p>	<p>Permits will be needed for the following activities:</p> <ul style="list-style-type: none"> <li>• Coastal reinforcements (Kosrae)</li> </ul> <p>The following regulations are applicable for this project:</p> <ul style="list-style-type: none"> <li>• Kosrae State Code</li> <li>• Kosrae Regulations for Development Projects</li> <li>• FSM Earthmoving regulations</li> <li>• FSM Labour Act</li> <li>• Yap State Code</li> <li>• Pohnpei State Code</li> <li>• Chuuk State Code</li> <li>• FSM National Code</li> <li>• Basel and Waigani Convention</li> <li>• Convention on Biological Diversity</li> </ul>
<p><b>Principle 2: Access and Equity</b>  <i>Projects/programmes supported by the Fund shall provide fair and equitable access to benefits in a manner that is inclusive and does not impede access to basic health services, clean water and sanitation, energy, education, housing, safe and decent working conditions, and land rights. Projects/programmes should</i></p>	<p>The exact sites for installation of water security interventions in Yap, Chuuk and Pohnpei are not yet determined. Under this principle, the guidelines state that allocating access to Project benefits should be fair and impartial. If the site selection and consultation process of Component 2 is not carefully planned, then there is the risk that there may be bias and therefore lack of access and equity to the improved water resources</p> <p>To demonstrate compliance with this principle, the ESMP describes the process of allocating and distributing the Component 2</p>

<p><i>not exacerbate existing inequities, particularly with respect to marginalized or vulnerable groups.</i></p>	<p>interventions and by showing how this process ensures fair and impartial access to benefits. One risk of fair access is the installation of interventions on private land without securing long term access to the interventions. Risks of this type are addressed in the ESMP.</p>
<p><b>Principle 3 – Marginalised and Vulnerable Groups</b>  <i>Projects/programmes supported by the Fund shall avoid imposing any disproportionate adverse impacts on marginalized and vulnerable groups including children, women and girls, the elderly, indigenous people, tribal groups, displaced people, refugees, people living with disabilities, and people living with HIV/AIDS. In screening any proposed project/programme, the implementing entities shall assess and consider particular impacts on marginalized and vulnerable groups.</i></p>	<p>This principle is not triggered by the project as there are no disproportionate adverse impacts foreseen from the various components due to the triggering of Principle 2.</p>
<p><b>Principle 4 – Human Rights</b>  <i>Projects/programmes supported by the Fund shall respect and where applicable promote international human rights.</i></p>	<p>This principle is triggered by all projects funded by AF.</p> <p>The AF bases this principle on the United National Declaration of Human Rights and requires that at a minimum, and regardless of whether the country is a Party to them, the nine-core international human rights treaties will be monitored.</p> <p>The project will adhere to this principle through contractual clauses with any contractors and through oversight by the IE</p>
<p><b>Principle 5 – Gender Equality and Women’s Empowerment</b>  <i>Projects/programmes supported by the Fund shall be designed and implemented in such a way that both women and men 1) have equal opportunities to participate as per the Fund gender policy; 2) receive comparable social and economic benefits; and 3) do not suffer disproportionate adverse effects during the development process.</i></p>	<p>There are known links between water supply, WASH and the role of the females in the house. It is therefore critical to ensure that ongoing consultation is undertaken with a fair gender representation throughout project implementation.</p> <p>The ESMP identifies key stakeholders or key stakeholder groups for women’s representation in consultations; provides specific instruct the implementation team to include woman in all future consultations; includes parameters for monitoring gender equality and women’s empowerment in the ESMP monitoring plan.</p>
<p><b>Principle 6 – Core Labour Rights</b>  <i>Projects/programmes supported by the Fund shall meet the core labour standards as identified by the International Labour Organisation.</i></p>	<p>This principle is applicable for all AF projects.</p> <p>As FSM has not ratified the ILO, the ESMP demonstrates how the ILO core labour standards will be incorporated in the design and the implementation of the project as appropriate.</p> <p>The project will adhere to this principle through contractual clauses with any contractors and also through oversight by the IE.</p>

<p><b>Principle 7 – Indigenous People</b>  <i>The Fund shall not support projects/programmes that are inconsistent with the rights and responsibilities set forth in the UN Declaration on the Rights of Indigenous Peoples and other applicable international instruments relating to indigenous peoples.</i></p>	<p>Most of the population of the project sites are indigenous, in the sense of having ancestral attachment to their land which is still important in the livelihoods of the majority who are rural dwellers. This reliance on natural resources and both customary and legal rights are recognised under Federal and State.</p> <p>As Indigenous Peoples are the overwhelming majority of direct project beneficiaries safeguard measures should be been integrated into the project's overall design through the ESMP. They include: (i) Free, prior, and informed consultation leading to broad community support during project preparation; (ii) Measures to ensure culturally appropriate processes and benefits; (iii) Measures to ensure that adverse impacts are mitigated and (iv) Measures for disclosing key project documents in a language understandable to them.</p> <p>Community consultation and regular engagement with the community is integral and the ESMP stipulates that this will be undertaken through the life of the project.</p>
<p><b>Principle 8 – Involuntary Resettlement</b>  <i>Projects/programmes supported by the Fund shall be designed and implemented in a way that avoids or minimizes the need for involuntary resettlement. When limited involuntary resettlement is unavoidable, due process should be observed so that displaced persons shall be informed of their rights, consulted on their options, and offered technically, economically, and socially feasible resettlement alternatives or fair and adequate compensation.</i></p>	<p>Component 2 will require the installation of water security interventions which are designed to be accessible to the entire community. It is expected that all interventions should be installed on government or communal land on the islands. However, if there are no suitable public lands, private lands may have to be used. If this is the case, the landowner would have to sign an easement to allow long term access to his lands for this purpose and also agree (depending on the type of intervention installed) to manage the land use around the intervention to prevent contamination from, for e.g. pig pens. This easement will only be entered on a voluntary donation basis.</p>
<p><b>Principle 9 – Protection of Natural Habitats</b>  <i>The Fund shall not support projects/programmes that would involve unjustified conversion or degradation of critical natural habitats, including those that are (a) legally protected; (b) officially proposed for protection; (c) recognized by authoritative sources for their high conservation value, including as critical habitat; or (d) recognized as protected by traditional or indigenous local communities.</i></p>	<p>Under the AF definitions in this principle, 'natural habitats' are within the Kosrae inland road construction footprint but none of these are considered to be 'critical natural habitats'. Under the Kosrae Land Use Plan the road alignment passes through 'Areas of Particular Concern' and 'Special Consideration Districts'. The design of the road will need to consider these areas.</p> <p>This ESMP describes these areas, explains why they cannot be avoided and discusses the potential impacts. For each affected critical natural habitat, provide an analysis on the nature and the extent of the impact including direct, indirect, cumulative, or secondary impacts; the severity or significance of the impact; and a demonstration that the impact is consistent with management plans and affected area custodians.</p>
<p><b>Principle 10 – Conservation of Biological Diversity</b></p>	<p>This principle is not triggered by the project as the road construction will not be undertaken in this project – only road design.</p>

<p><i>Projects/programmes supported by the Fund shall be designed and implemented in a way that avoids any significant or unjustified reduction or loss of biological diversity or the introduction of known invasive species.</i></p>	
<p><b>Principle 11 – Climate Change</b>  <i>Projects/programmes supported by the Fund shall not result in any significant or unjustified increase in greenhouse gas emissions or other drivers of climate change.</i></p>	<p>Not applicable to this project</p>
<p><b>Principle 12 – Pollution Prevention and Resource Efficiency</b>  <i>Projects/programmes supported by the Fund shall be designed and implemented in a way that meets applicable international standards for maximizing energy efficiency and minimizing material resource use, the production of wastes, and the release of pollutants.</i></p>	<p>Component 3 has the potential to produce pollution and the contractor will be required to produce a ‘Waste and Pollution Prevention Management Plan’ as detailed in the AF ESS guidelines.</p> <p>Component 2 may require the production of concrete for any construction work during installations and this ESMP provides the measures that must be implemented to avoid spillage and pollution.</p>
<p><b>Principle 13 – Public Health</b>  <i>Projects/programmes supported by the Fund shall be designed and implemented in a way that avoids potentially significant negative impacts on public health.</i></p>	<p>There are clear impact risks during the component 3 construction activities and operational phase with the coastal protection work, from movement of construction machinery, changes in traffic patterns and potential increase in sediment loading streams and the coastal environment etc.</p> <p>There are also potential public health impacts from the water security interventions in component 2 and this ESMP provides mitigation measures and strategies.</p>
<p><b>Principle 14 – Physical and Cultural Heritage</b>  <i>Projects/programmes supported by the Fund shall be designed and implemented in a way that avoids the alteration, damage, or removal of any physical cultural resources, cultural sites, and sites with unique natural values recognized as such at the community, national or international level. Projects/programmes should also not permanently interfere with existing access and use of such physical and cultural resources.</i></p>	<p>The nature of the known cultural sites along the Kosrae road alignment have been identified and described in the EIS. The EIS also provides a chance find procedure for discovery of any as yet unknown cultural site. This will need to be considered during the design phase.</p> <p>The ESMP includes the chance find procedure and includes measures to be taken during construction to protect these known and as yet unknown sites.</p>
<p><b>Principle 15 – Lands and Soil Conservation</b>  <i>Projects/programmes supported by the Fund shall be designed and</i></p>	<p>This principle is not applicable to this project as the Kosrae road construction activity is limited to design only.</p>

*implemented in a way that promotes soil conservation and avoids degradation or conversion of productive lands or land that provides valuable ecosystem services.*

## 4. PART III: IMPLEMENTATION ARRANGEMENTS

### A. Institutional Arrangements

#### Project Implementing Agency

The Secretariat of the Pacific Regional Environment Programme (SPREP) will undertake the responsibilities of the Adaptation Fund Project Implementing Agency for the Project. SPREP will provide management, financial and technical oversight through a Task Manager. The Task Manager will be responsible for project oversight, undertake supervision missions and monitor and report progress to an internal Task Team Group, consisting of staff with relevant expertise (i.e. SPREP Project Review and Monitoring Group). SPREP, as the Adaptation Fund IA, can assist in ensuring the results of the project are distilled and disseminated regionally, within the AF and other agency channels to promote uptake of information in country dialogues.

#### Project Executing Agency

The Department of Environment, Climate Change & Emergency Management (DECEM) will undertake the responsibilities of the Project Executing Agency. The PEA will establish the Project Management Unit (PMU) - a fully dedicated team to oversee project implementation including the management and oversight of all activities undertaken by the technical experts / organisations; project procurement including contract administration and management; project monitoring and evaluation; oversight of all engagement, and knowledge management, outreach and communication activities. The PMU will also act as the Secretariat for the Project Steering Committee and will assist this Committee in undertaking their responsibilities.

#### Project Management Unit

The Project Management Unit (PMU) core staff (Figure 12) will include a: Project Manager, Project Accountant, Knowledge & Communication Officer and Operations & Finance Officers for Kosrae, Pohnpei, Chuuk and Yap. Island Coordinators will be appointed for the six outer islands (Woleai, Eauripik, Satawan, Lukunor, Nukunoro and Kapinga). Funding for the outer island coordinators will be divided between the PMU budget and Component 2 due to the role's on-ground technical assistance and overall island coordination responsibilities.

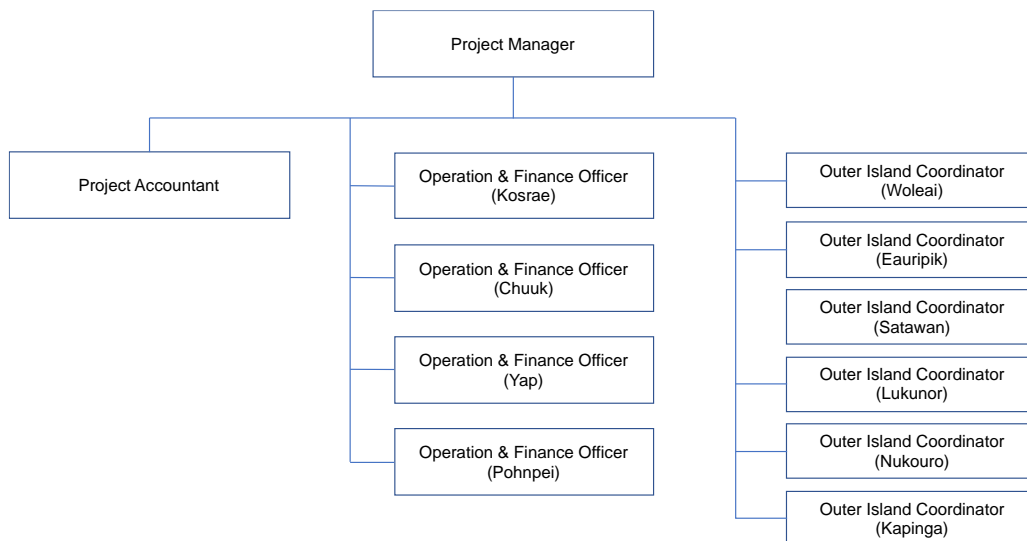


Figure 12. Project Management Unit structure

The Project Manager will provide oversight and management of the operations of the project. A Project Accountant will support the Project Manager in managing the project's finances. In addition, the PMU will hire as appropriate, short-term and long-term consultants to undertake key activities, e.g., to provide technical expertise across the activities.

Core responsibilities include:

Position	Key Responsibilities
National Project Director	<ul style="list-style-type: none"> <li>• Organize and co-chair the Project Board reviews</li> <li>• Provides high-level advice to the Board on progress, risks, and issues against the objectives of the project.</li> <li>• Monitor and control the progress of the project at a strategic level, in particular reviewing the objectives of the project regularly</li> <li>• Appoint the project management team</li> <li>• Ensure overall objective and goals of the project remains on target, is achievable and will be completed within the agreed scope of the project</li> </ul>
Project Manager	<ul style="list-style-type: none"> <li>• Overall responsibility for the implementation of the project</li> <li>• Engage with external stakeholders to achieve project objectives</li> <li>• Responsible to the NIE for fulfilling monitoring and evaluation activities under the project.</li> <li>• Liaise with SPREP Country Programme Manager and account managers</li> <li>• Lead and motivate the project management team</li> <li>• Manage the information flows between the directing and delivering levels of the project</li> <li>• Provide oversight to the project activities of each component, taking responsibility for overall progress and use of resources and initiating correction action where necessary</li> <li>• Secretary to the Project Board</li> <li>• Advise the Project Board through the National Project Director of any deviations of the project.</li> <li>• Prepare bi-annual progress reports</li> <li>• Schedule and respond to annual financial audits</li> </ul>
Project Accountant	<ul style="list-style-type: none"> <li>• Manage and advise on project financials</li> <li>• Develop and forecast the financial outlook and report to relevant stakeholders</li> <li>• Provide financial advice to the Project Manager</li> <li>• Provide administrative support for the project management team at national level</li> </ul>
Knowledge & Communication Officer	<ul style="list-style-type: none"> <li>• Lead the project's knowledge and communications including development of a strategy and implementation of the strategy</li> <li>• Lead and guide the development of project knowledge products</li> <li>• Provide advice to the project team on knowledge and communications</li> </ul>

Operations & Finance Officers	<ul style="list-style-type: none"> <li>• Support the Project Manager to manage the implementation of activities at the State and outer island levels</li> <li>• Provide advice on State and outer island policies, procedures, practices</li> <li>• Provide administrative and financial support on State-led activities</li> <li>• Provide regular reports on progress to the Project Manager</li> </ul>
Outer Island Coordinators	<ul style="list-style-type: none"> <li>• Coordinate the execution of activities and services on the outer islands with the island / municipal governing councils</li> <li>• Report progress, risks and issues of the project to the OFO's and Project Manager</li> <li>• Communicate project data and information to the Project Manager, outer island councils and communities</li> </ul>

**Table 18. Estimate project management costs**

Execution Activity Role	US\$
<b>Project Management Unit Staff</b>	
Project Manager	\$144,220
Project Accountant	\$84,000
Knowledge & Communication Officer	\$60,000
Operations & Finance Officers	\$224,000
Outer Island Coordinators	\$96,000
<b>Monitoring &amp; Evaluation</b>	
Terminal evaluation	\$50,000
<b>Office Costs</b>	
Office supplies	\$33,098
<b>Travel &amp; Workshops</b>	
Travel	\$47,000
Workshops	\$5,700
<b>Audits</b>	
External Auditor	\$44,000
<b>Total</b>	<b>\$788,018.00</b>

### Implementation Partners

Given the political and geographical environment of FSM, the project will be working through multiple political layers i.e. national, state, and outer islands. Whilst the Executing Agency and Project Management Unit will be positioned at the national level, it is important to ensure the States and the outer islands feel ownership and 'buy-in' into the project. To assist with the implementation of activities at the State level, the project will be working closely with the State Governments as implementing partners i.e. Kosrae State Government, Pohnpei State Government, Yap State Government and Chuuk State Government (Figure 17).

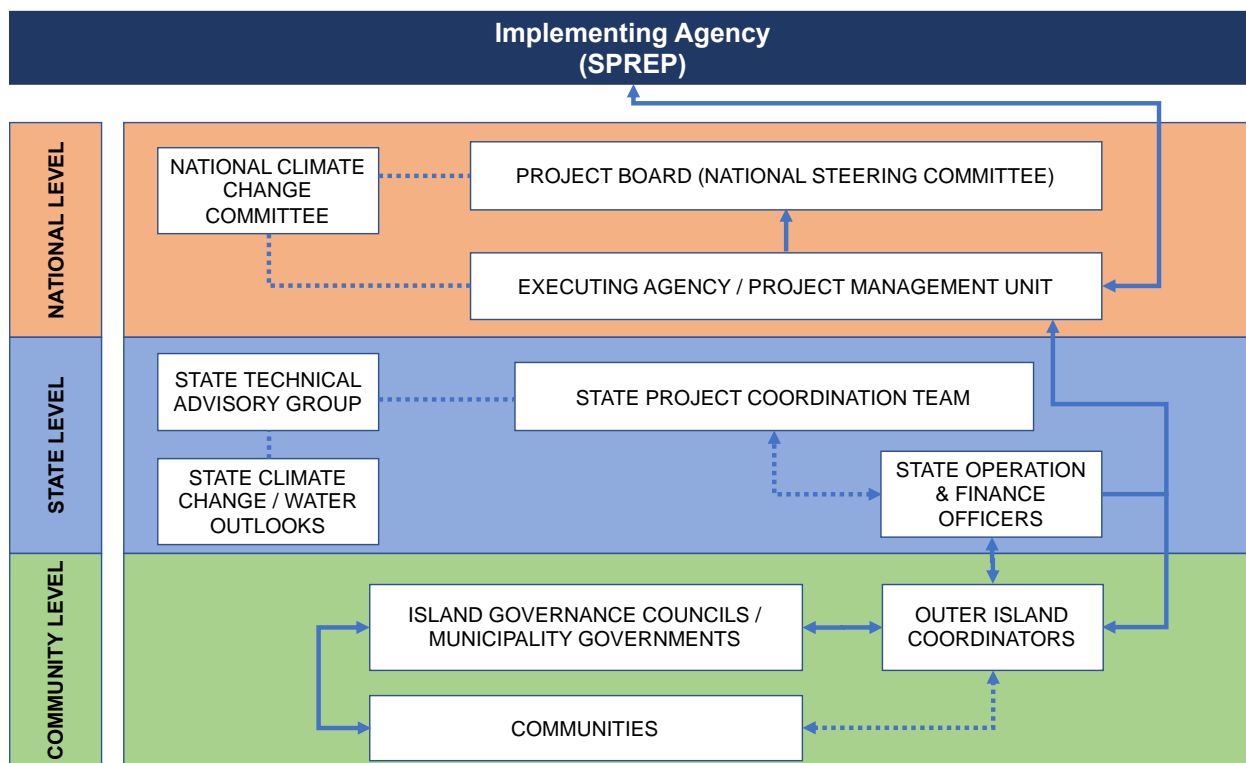


Figure 13. Project implementation arrangements at national, state and outer island level

## Governance Structure

### Project Board

To adhere to the governance requirements for the project, a Project Board will be established. The Board will provide the independent approval process for the annual workplans and funding allocations as well as provide advice on how best to link the project outputs to national and state policy mechanisms. Specifically, the Project Board will have responsibility for:

- Approving the resources and authorizing the funds necessary for the project
- Ensure effective decision making across the project components and activities
- Providing visible and sustained support for the Project Manager
- Ensure effective communication both within the project team and with external stakeholders
- Provide assurance that all activities have been delivered satisfactorily
- Approve the Terminal Report and ensure that any issues, lessons, and risks are documented and passed on to the appropriate body
- Support approval of project closure and send project closure notification to SPREP

The Board will consist of representatives from:

- Department of Environment, Climate Change and Emergency Management (Chair)
- Department of Resources and Development Yap
- Environment Protection Agency Chuuk
- Environment Protection Agency Pohnpei;
- Kosrae Island Resource Management Authority (KIRMA) Kosrae

- Department of Transport & Infrastructure Kosrae
- Office of Development Assistance (ODA) Kosrae
- Office of Attorney General
- Secretariat of the Pacific Regional Environment Programme (SPREP)

Observers may include the following with invitations at the discretion of the Project Management Unit:

- Micronesian Challenge
- Micronesian Conservation Trust (MCT)
- International Organization for Migration (IOM)
- College of Micronesia
- South Pacific Community (SPC)
- SPC North Pacific Regional Office (NPRO)
- United Nations Development Programme (UNDP)
- Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ)

## **B. Financial and Project Risk Management**

The core institutional, project and financial risks have been identified and are outlined in the Project Risk Management Plan below. The Plan will continue to be monitored and updated by the Project Management Unit throughout the project term.

Project:	Enhancing climate change resilience in vulnerable communities in the outer islands of the Federated States of Micronesia										Project Number:							
Date of Development / Last Review:	March 2020										Date of Next Review:	October 2020					Country:	Federated States of Micronesia
Program Manager:	Richard Moufa																Sector/s:	
Objectives:																		
Risk Event - what could happen	Risk Source - what could cause the event to happen	Risk Impact - what would happen if the event occurs?	Has this risk occurred in this program?	Risk rating before any controls			Existing Controls (what's currently in place?)	Overall Control Effectiveness	Proposed Treatments (if no further treatment required or available, please explain why)	Person(s) Responsible for Implementing Treatments	Implementation Date for Proposed Treatments	Target rating when Proposed			Does this risk need to be escalated?			
				Likelihood (refer to matrix)	Consequence (refer to matrix)	Risk Rating (refer to matrix)						Likelihood (refer to matrix)	Consequence (refer to matrix)	Risk Rating (refer to matrix)				
<b>Institutional Risks</b>																		
Delay in recruiting appropriately skilled staff and continuity of staff	Lack of skilled professionals in the country	Project may be delayed in commencement due to lack of resources	Yes	Likely	Moderate	High	No existing controls, however recruitment processes follow Government of FSM guidelines	Partly effective	Advertising in FSM and utilise advertising through job sites and promote through contact networks.	Executing Agency	Commencement of project	Likely	Moderate	High	No. PMU is now in place			
High turnover of staff members in project management unit may negatively impact on the delivery of project activities	Lack of resources to deliver role requirements; better job offers elsewhere	Reduced capacity of Project team; Loss of project knowledge; Delayed delivery on Project activities	No	Possible	Minor	Moderate	All project-related staff positions are recruited at FSM staff rates. Implementation of professional development opportunities.	Effective	Positions are recruited at rates as per FSM project staffing guidelines; incentives e.g. training and development provided to personnel	Executing Agency	Ongoing	Possible	Moderate	Moderate	No			
Lack of an enabling environment to enable the Project to work effectively on the outer islands	Constraints in the political environment and coordination at national, state and island level, and / or poor relationship building between the project and state and island level	Project delays; inability of the project to undertake evidence base and implement interventions	No	Likely	Major	High	Mechanisms for working in the outer islands are in place including building strong relationships with the States and outer island communities	Partly effective	Project will work through State and Outer Island mechanisms; community engagement and participation will be a priority	Executing Agency	Ongoing	Possible	Moderate	Moderate	No			
Reputational risk for the Executing Agency and Implementing Agency	Poor implementation of project activities in the outer islands; lack of proper and effective community engagement; political agendas change	Project delays; loss of faith from the Government (National and State level) and Outer Islands in the project	No	Possible	Moderate	Moderate	The PMU is experienced in working on the Outer Islands and understands the internal systems; relationships at the national, state and outer island level are in place	Partly effective	Project will establish and maintain continual feedback processes between the outer islands and states; joint decision-making framework is developed and in place under the project; the states and outer islands are to be involved / consulted in all aspects of the project impacting upon them	Project Management Unit	Ongoing	Possible	Minor	Moderate	No			
Project is no longer supported at the Government level	New Government and/or change in Government priorities	Reduced support from Ministries, States and outer islands for the Project	No	Possible	Moderate	Moderate	The project currently has the support of the Government at all levels and strong communication channels are in place between the national, state and outer island communities	Effective	The project will ensure stakeholders at the national, state and outer island level is provided with regular updates on progress; the findings from the project will provide core evidence of the importance of such projects in the outer islands	Project Management Unit	Ongoing	Possible	Minor	Moderate	No			
Implementation of project becomes challenging due to inputs from various sectors	Change in policies, increased interest in the project from sectors	Project implementation could be delayed or slowed whilst decisions are made	No	Possible	Moderate	Moderate	Clear outline of the project objectives and functions at the national, state and island level is provided.	Uneffective	Open communication pathways between the project and Government (national, state and island) and provision of regular updates. Project Steering Committee is established and provides an avenue for inputs from sectors and interested parties	Project Manager	Ongoing	Possible	Minor	Moderate	No			
Inadequate monitoring and evaluation plans that fail to establish relevant baselines and data collection methodologies result in the program being unable to validate results in a manner that can demonstrate progress towards agreed outcome achievement.	Poor quality partner M&E systems; partner competency deficits prevent the timely establishment of relevant baselines	Project is unable to validate results in a manner that demonstrates progress against targets	No	Possible	Minor	Moderate	Systems are currently not in place for the project	Uneffective	M&E plan is developed as part of the project plan and will be reviewed upon implementation during the inception phase. Greater engagement between the IA and EA to build M&E capacity. Establishment of M&E Officer position within the Project Coordination Unit. Project is designed to include baseline and regular tracking and reporting.	Project Manager and M&E Officer	Ongoing	Possible	Minor	Moderate	No			

Risk Event - what could happen	Risk Source - what could cause the event to happen	Risk Impact - what would happen if the event occurs?	Has this risk occurred in this program?	Risk rating before any controls			Existing Controls (what's currently in place?)	Overall Control Effectiveness	Proposed Treatments (If no further treatment required or available, please explain why)	Person(s) Responsible for Implementing Treatment/s	Implementation Date for Proposed Treatment/s	Target rating when Proposed			Does this risk need to be escalated?
				Likelihood (refer to matrix)	Consequence (refer to matrix)	Risk Rating (refer to matrix)						Likelihood (refer to matrix)	Consequence (refer to matrix)	Risk Rating (refer to matrix)	
<b>Project Risks</b>															
Project roll-out and/or activities are delayed	National, State and outer islands fail to agree on the rollout of activities in a timely manner	Delays across all activities	No	Possible	Major	High	Inception workshops have been undertaken in States to ensure common understanding of the project	Partly effective	The project will work with stakeholders on timelines and activity roll-out	Executing Agency	Ongoing	Possible	Major	High	Yes
	Project plan and budget is not appropriately established to enable effective implementation	Delays across all activities or activities not able to be implemented due to inadequate funding	Yes	Almost Certain	Severe	Very High	Review of the project undertaken by the IA and EA leading to agreement the project requires a restructure to effectively implement activities and to realign activities which are not possible to undertake due to budget insufficiencies	Effective	A restructuring paper has been submitted to the AF seeking amendments to the project plan and budget	Implementing Agency and Project Management Unit	Ongoing	Unlikely	Severe	High	Yes
	Boats or charter flights are cancelled or are not able to be booked for project transportation. Boats are also dry docked for repairs.	Delays in visits to islands impacting on transport of materials or personnel to undertake activities	No	Likely	Major	High	The PMU is exploring all options, however, these are limited. Working with the boat company for schedules and to negotiate additional days on the island for project personnel	Effective	The existing controls are adequate at this point however, monitoring needs to continue	Project Management Unit	Ongoing	Likely	Moderate	High	No
	A natural disaster or inclement weather	Potential delays to the whole project depending on the impact of the disaster and location; Delays across activities due to weather conditions delaying transport or ability to undertake fieldwork	No	Possible	Moderate	Moderate	GOK has an early warning system in place however there are no controls in place for the project if this leads to delays	Uneffective	The project will work closely with KMS to monitor any events and provide mitigation actions at the time	Project Management Unit	Ongoing	Possible	Moderate	Moderate	No
	Disease outbreak and health emergencies	Potential delays to implementation of project due to quarantine mechanism put in place by target communities for any visitors to the communities; Marine transportation are reserved for medical emergency use only	Yes	Likely	Moderate	Moderate	NA		Alternate timeline of project's extension	Project Management Unit	Mid-2020	Possible	Moderate	Moderate	No
	Institutional arrangements or focal point for sectors at the national, state or island level are not in place which are critical to undertaking project activities	The activity may be delayed or not able to be undertaken	Yes	Almost Certain	Moderate	High	The PMU is working with the national departments to determine responsibility for water management and activities moved to mid-2020 to wait for a decision on who will lead in the water sector at the national level.	Effective	If the activity is unable to be undertaken as per the project plan, adaptive measures will be implemented and the activity revised to suit the environment	Project Manager	Mid-2020	Likely	Moderate	High	Yes
	Permissions from council of traditional leaders on outer islands could delay visits and activities	Field visits cannot go ahead and activities on-ground are delayed	Yes	Possible	Major	High	The PMU is working closely with outer island coordinators and State coordinators to ensure permissions for visits are worked into the project implementation timelines	Effective	n/a at this stage	Project Management Unit	Ongoing	Possible	Moderate	Moderate	No
Effective engagement and consensus building by different water users, public and private stakeholders to agree on an integrated approach to freshwater and wastewater management	Lack of active engagement with ALL community members on the various options on water/waste managements.	Benefits of project may delay	No	Possible	Moderate	Low	The PMU is working closely with the state utility companies and other local NGO's and similar project on the best integrated approach	Effective	The project needs to consult the community and project stakeholders on the integrated approach before implementation of project	Project Management Unit and the States Project Technical Group	Mid-2020	Likely	Minor	Moderate	No
Community acceptance of technical design options proposed by project	Community members and leadership were not consulted enough on the proposed type of technology	Implementation of the project will be delayed and potential expense add on for redesign of technology	No	Likely	Moderate	Moderate	PMU's ongoing development of awareness tool will help address the risk	Effective	Encourage more consultancy and engagement with community or redesign technology to suites the local settings	Project Management Unit and the States Project Technical Group	Mid-2020	Likely	Minor	Moderate	NO
Failure to engage effectively with stakeholders and achieve implementation of activities	The activities in the outer islands are developed and implemented without appropriate input from relevant stakeholders	Lack of stakeholder 'buy-in' into the on-ground adaptation measures	No	Likely	Major	High	The project has undertaken inception workshops and consultations at the national, state and outer island level to ascertain inputs and amend implementation strategy. Stakeholder engagement is continuing through the PMU and led by the community coordinators, State Finance & Administration Officers and the National Project Manager.	Effective	In addition to existing controls, strengthened coordination mechanisms and engagement as outlined in the project logframe and as per the existing controls	Project Management Unit	Ongoing	Possible	Major	High	No

Endorsement of interventions in outer islands may take longer than expected	The island, state and national political environment does not enable the turnaround time for approval of interventions or any necessary policies and procedures	Interventions are not agreed to with communities; Policies and procedures are not endorsed; delay in implementation of activities	No	Possible	Major	High	Continued engagement between the PMU with stakeholders at the national, state and outer island level	Effective	The project management unit is ensuring all stakeholders at all levels are engaged in consultations and decision-making. The national and state Governments are kept informed of progress via regular communications from the PMU	Project Management Unit	Ongoing	Unlikely	Moderate	Moderate	No
Lack of use of water and sanitation facilities installed by the Project	Lack of stakeholder engagement; cultural considerations; utilisation of the evidence-base to make decisions on the options; inappropriate infrastructure	Poor implementation and ineffective use of the installations	No	Possible	Major	High	The project plan has been amended to ensure the outer islands have clearly identified options for infrastructure. Furthermore, outer island communities will be engaged in decisions and input into the options to ensure the appropriateness of the options in the island / village context	Effective	Continued engagement with the communities and ensure inputs are incorporated into the options and design of the options	Project Management Unit	Ongoing	Possible	Moderate	Moderate	No
Traditional values and governing structures restrict the participation of women	Cultural traditions and values	Lack of full stakeholder engagement and buy-in	No	Possible	Moderate	Moderate	The project team ensure there are separate meetings for women and men, and have island facilitators	Effective	Whilst this is effective, the project requires a Gender & Social Inclusion Plan which will provide greater detail on mitigation actions to be undertaken	Project Management Unit	Ongoing	Possible	Minor	Moderate	No
Failure to implement the ESM Plan	Lack of understanding of the importance of the ESM Plan and how to implement the mitigation actions	Poor implementation and failure to effectively meet the project objectives	Yes	Possible	Major	High	A revised ESM Plan has been developed and budgeted for in the project plan. Training has been put in place for the PMU and the ESM Plan is also being monitored by the IA	Effective	Ensure training and on-going guidance is provided to the PMU to ensure full implementation of the Plan	Implementing Agency and Project Management Unit	Ongoing	Unlikely	Moderate	Moderate	No
Theft of assets from the water systems	Community members take assets for personal use	The assets e.g. tanks are no longer available for community use	No	Possible	Moderate	Moderate	A MOA and regulations are in progress addressing this issue. The project is working with the municipal and national governments to treat any infrastructure built by the FSM AF project to be considered national property for the duration of the project, thus, any damage to the infrastructure will be considered a national offence. In addition, the community coordinator role will be to make sure the infrastructure is secured, protected and well maintained.	Effective	n/a at this stage	Project Management Unit	Ongoing	Unlikely	Minor	Low	No
Construction Materials Shortage	Lack of coordination with local suppliers and bigger projects and government demands of supplies for its relief disaster efforts will be prioritized	Stalling of project implementation of construction technologies	No	Likely	Moderate	Moderate	A list of needed/ required construction materials have been identified by the relevant stakeholders.	Effective	Acquire services/ materials from foreign countries/ suppliers	Project Management Unit	Ongoing	Possible	Moderate	Moderate	No
In-Kind contribution from local communities	Lack of cooperation and coordination and agreements between community leaders, members and the state leaderships on ownership of the project and key roles and responsibilities	Additional cost for project to cover labor and local construction materials provided by the community.	No	Likely	Moderate	Moderate	Development of MOU/ MOA between community leadership and the project on set/ specific roles of community during implementation of project	Effective	Secure co-finance scheme from the state and national government	Project Management Unit	Ongoing	Possible	Moderate	Moderate	No
Training is not customised for outer island audiences	'Off the shelf' training courses do not address cultural issues and practicality of systems and available services in the outer islands, so are inappropriate and do not achieve desired project outcomes	Reputational damage to the project; wasted investment in trainings; outer island people have time away from other duties without any practical advantage or value	No	Possible	Moderate	Moderate	The project is ensuring all community trainings are appropriate, in the island language and follow appropriate cultural guidelines	Effective	The project will ensure any training is appropriately framed for the audience. Training and mentoring will be ongoing throughout the life-of-the project and not based on one-offs. The training will also focus on train-the-trainer to ensure sustainability	Project Management Unit	Ongoing	Unlikely	Minor	Low	No

Risk Event - what could happen	Risk Source - what could cause the event to happen	Risk Impact - what would happen if the event occurs?	Has this risk occurred in this program?	Risk rating before any controls			Existing Controls (what's currently in place?)	Overall Control Effectiveness	Proposed Treatments (If no further treatment required or available, please explain why)	Person(s) Responsible for Implementing Treatment/s	Implementation Date for Proposed Treatment/s	Target rating when Proposed			Does this risk need to be escalated?
				Likelihood (refer to matrix)	Consequence (refer to matrix)	Risk Rating (refer to matrix)						Likelihood (refer to matrix)	Consequence (refer to matrix)	Risk Rating (refer to matrix)	
<b>Financial Risks</b>															
Funds misappropriation, corrupted procurement, contract and human resource management processes	Poor contract determination processes, poor financial management systems and processes	Reputational damage to partner and the project. Resources applied to achieving project objectives reduced. Undermining in AF confidence in working with delivery partner and county partner. Possible ineligible expenses	No	Unlikely	Major	Moderate	Engagement with known partners with good reputation; Government of FSM financial management and procurement systems and controls are in place confirming appropriate management capacities and controls; budgets and program deliverables designed to ensure effective procurement; budget categories clearly defined; proactive monitoring of programs, budgets and acquittals.	Very effective	No further treatment required; current arrangements appropriate to feasibility of risk management in current context	Project Manager / Finance Manager	Ongoing	Unlikely	Major	Moderate	No
Financial audits are not provided in a timely manner or show discrepancies	No internal audit controls in place	A lack of appropriate financial management reduces reputation of the project and Executing Agency	Yes	Likely	Minor	Moderate	Government of FSM audit processes are in place, however, the first EA audit was procured by the IA due to the EA not being able to procure an Auditor and thus leading to a potential conflict	Ineffective	The IA and EA Financial Units have been informed the EA has to undertake responsibility to procure and lead on the audit on the EA. Delineation between IA and EA needs to be put in place. The EA is now implementing a ToR for an Auditor to undertake the Audits for the entirety of the project.	Project Manager / Finance Manager	Ongoing	Unlikely	Moderate	Moderate	No
Complaints on inappropriate procurement of work packages	No procurement process is in place or implemented	Reputational risk; poor delivery of services	No	Unlikely	Moderate	Moderate	Government of FSM procurement processes are in place	Very effective	No further treatment required; current arrangements appropriate to feasibility of risk management in current context	Project Manager / Finance Officer	Ongoing	Unlikely	Minor	Low	No
Project is delayed due to delays in contracts	Contractual negotiations are slow	Project implementation delays	Yes	Likely	Moderate	High	No existing controls are currently in place	Ineffective	The IA and EA are experienced in contract administration and will work closely to ensure contractual negotiations are undertaken in a timely manner.	Implementing Agency & Project Executing Agency	Ongoing	Unlikely	Minor	Low	No
Activities are under-budgeted or costs increase	Activities may not be able to commence or be undertaken fully	The project does not successfully meet its objectives	Yes	Almost Certain	Major	Very High	The original project plan and budget have been reviewed, highlighting challenges with meeting the project objectives. The review has triggered a restructuring paper to better align activities and budgets.	Effective	The new project budget has been planned out in detail and the scale and scope of the project has been reduced during the restructuring phase. Budgets have been developed to allow flexibility within the activities and the funds allocation	Implementing Agency & Project Management Unit	Ongoing	Possible	Moderate	Moderate	No
Non-procurement of essential items for field visits to the outer islands	Lack of understanding by finance department of the requirements for outer island visits	The team may miss the timeline to visit the outer islands	Yes	Likely	Major	High	The PMU has been asked to prepare a brief or manual on operations in the outer islands including requirements for visits. The manual / brief will be approved by the Implementing Agency, thus establishing clear guidelines for finance units.	Effective	n/a at this stage	Project Management Unit	Ongoing	Possible	Minor	Moderate	No

## **C. Environmental and Social Risk Management**

According to the assessment undertaken against the AF ESS Policy, the Project has a risk rating of Category B meaning that it can have minor (or easily reversible) environment, social or gender impacts.

The ESMP was reviewed and revised in October 2019, and will undergo a further review to assess any outstanding risks associated with the revised activities under Component 3, noting that ESS audits will be undertaken on an annual basis to ensure compliance with the Adaptation Fund ESS Policy and to ensure compliance with the measures outlined in the ESMP and provide updates to the ESMP.

The ESMP focuses on process-oriented risk management, where the mechanisms are incorporated into the program's implementation to ensure that rigorous risk assessment and management measures are applied to each intervention, as they defined, approved and implemented across the relevant activities.

### **Screening for Interventions**

During implementation of the project, a checklist will be used for the regular examination of the components and activities. A screening checklist has been prepared for the EE PMU and is included in the ESMP. This document attempts to apply the 15 Principles of the AF ESP to all proposed infrastructure, water security and sanitation interventions as they are designed, in a way that the PMU can easily understand better what they are trying to achieve and the AF objectives.

### **Community Engagement**

Critical to the management of risk during project design and implementation is the continual, inclusive, and well-planned consultation and engagement plan. The plan is aimed at early and consistent stakeholder involvement and engagement with a focus on the target communities, including women, youth, and vulnerable groups. The ESMP has a detailed Community Engagement Plan which identified responsibilities, timeframes, milestones, and objectives. As a Gender and Social Inclusion Plan had not been developed during the initial project planning phase, the PMU will contract a Gender Specialist to develop a Project Gender & Social Inclusion Plan, and who will work with the Project team to develop mechanisms to ensure effective facilitation at all community consultations. The Outer Island Coordinators established on each of the target outer islands will also be tasked to ensure that communications between the PMU and the communities are regular and meaningful.

The PMU will ensure that marginalised and vulnerable groups in the targeted areas are included in public consultations, holding smaller focus groups as necessary, including: the disabled, single mothers who are heads of households and the elderly

### **Land Access**

The Project requires that no infrastructure can be installed on any lands without a formal agreement in place with the landowner. The process for securing the land is detailed in the ESMP and will be carried out during the initial scoping phase of the activities to prevent delays during installation.

### **Grievance Mechanism**

The ESMP has established a complaints procedure, which will be the Grievance Redress Mechanism (GRM). Complaints pertaining to the project activities implemented with AF resources will be addressed to executives of the PMU. The GRM is designed to ensure that members of the public can submit grievances to the PMU via email, in writing, by telephone or in person. Additionally, it is designed to account for the traditional complaints processes in villages by which community members can submit grievances directly with their Island Council, or village leaders who will, in turn, then forward the complaint to the PMU. The five-step grievance management process will be applied to the project by the following process.

Step	Application/How	Responsibility
Publicise the process	Develop a procedure which explains how the grievance mechanism will work on the specific project site	SPREP, DECEM
	Present the grievance mechanism at a public meeting help with affected communities	DECEM, EPA Yap, Chuck, Pohnpei; KIRMA Kosrae
Receive and register	Identify locations to receive grievances and ensure accessibility to all affected stakeholders	DECEM, EPA Yap, Chuuk, Pohnpei; KIRMA Kosrae
	Recognise that some grievances may be submitted in writing while others will be communicated verbally. All grievances are to be treated with the same level of seriousness and respect.	
	Log all complaints into a database	
Review and investigate grievances	Review and investigate grievances	EPA Yap, Chuuk, Pohnpei; KIRMA Kosrae
	Explain the process and the timeframe for the GRM process	
	Appoint an appropriate person to obtain information and investigate.	
Develop resolution options, response to grievances and closeout	Develop a proposed resolution process, involving communities where appropriate	State level – EPA Yap, Chuuk, Pohnpei; KIRMA Kosrae
	Implement the agreed solution	DECEM
	Follow-up with complainant to ensure satisfaction	
	If unsatisfied: Discuss further options. Identify local partners who might be able to assist in finding solutions	
	If still unresolved, refer matter to third-party mediation or external review.	
Monitor and Evaluate	Regularly monitor the number and type of grievances received, resolved and outstanding	DECEM, SPREP
	Evaluate trends over time and stages of project development	
	Report all grievances to the SPREP via relevant periodic reporting	DECEM

## D. Monitoring and Evaluation Arrangements

Roles and responsibilities for M&E will be shared by the Implementing Agency, the Executing Agency and PMU as described in Table 19.

The Project Executing Agency will be responsible for the implementing the monitoring and evaluation strategy and ensuring reporting of progress against workplans. The Results Framework will serve as the basis for project monitoring and evaluation (M&E) and additional impact assessments will be undertaken throughout the project cycle.

Implementation progress will be monitored against Results Framework Indicators and data will be stored in the project management information system for project management and evaluation (refer Activity 4.2.2). The project will conduct a series of baseline surveys at the onset of the project implementation, followed by assessments at the mid-term and project end dates to determine the project achievements against the Project Objective and Key Results.

An externally engaged consultant will undertake a mid-term review and project completion review. The reviews will evaluate achievements against the Key Results Indicators and assess progress and achievements against the project components, and ultimately the project development objective.

**Table 19. M&E roles and responsibilities**

Stakeholder	Roles and Responsibilities
Implementing Agency	<ul style="list-style-type: none"> <li>● Provide high level oversight, guidance and M&amp;E expertise as required.</li> <li>● Ensure M&amp;E is embedded in project operations</li> </ul>
Project Management Unit and Executing Agency	<ul style="list-style-type: none"> <li>● Lead and manage M&amp;E activities and project reporting</li> <li>● Develop detailed results framework and M&amp;E Implementation Plan during the scoping phase</li> <li>● Design and carry out or commission the baseline/situation analysis</li> <li>● Ensure responsibilities and timing for collection of monitoring data is clear</li> <li>● Design reporting templates and tools and provide guidance on their use</li> <li>● Ensure collection of monitoring data is integrated into project activities</li> <li>● Coordinate gathering of information from monitoring visits</li> <li>● Manage and analyse project M&amp;E data as required</li> <li>● Carry out or commission and manage real time studies as required</li> <li>● Use M&amp;E data and information to guide project implementation, including through the convening of regular reflection sessions with the IA, DPs and other stakeholders as appropriate</li> <li>● Commission and manage an end-of-program evaluation, including an analysis of socioeconomic benefit</li> <li>● Manage dissemination of M&amp;E data and reporting to stakeholders</li> </ul>
Implementation Partners	<ul style="list-style-type: none"> <li>● Provide regular reports and data as required by the M&amp;E Implementation Plan</li> </ul>
Outer Island Councils	<ul style="list-style-type: none"> <li>● Provide access to data and information as required</li> <li>● Facilitate M&amp;E at the Island level by arranging access and authorising activities</li> </ul>

## Independent Evaluation

The project would carry out at least two independent external evaluations as follows:

**Mid-term Evaluation:** The project will undergo an independent Mid-Term Evaluation (MTE) at the mid-point of project implementation, managed and oversighted by the Implementing Agency. The MTE will determine progress being made toward the achievement of outcomes and will identify course correction if needed. The evaluation will address effectiveness, efficiency, and timeliness of project implementation. It will check the relevancy of the project activities so far carried out by the project. It will outline risks and issues that relate to the management and implementation of the project. The list of recommendations will highlight decisions and actions that require responses and execution. The evaluation will review and suggest lessons in relation to the design, implementation, and management of the project. The findings of the evaluation will inform the final half of the project period.

**Final Evaluation:** The project will undergo a final evaluation that will be carried out within three months following implementation closure of the project. The evaluation will be carried out by an independent evaluation time. A final project annual review (PAR) meeting will be conducted following the completion of the final evaluation report. All stakeholders will review the report and the final PAR meeting will be to present, discuss, finalize, and endorse the final evaluation report of the project.

The content of the evaluation report will include progress towards the outcome of the project. It will review any immediate impact and sustainability of results of the project. It will outline results against the strategic results framework and provide a conclusion, of whether the project has achieved its goal, objectives, outcomes and outputs it set out to implement. A review on the contribution to capacity development and knowledge management in FSM would be presented in the report. The report will outline key management and capacity recommendations highlight results, lessons learned, best practices. It must amalgamate these results into a section of the report, designed to be useful for future projects and or programs of FSM.

The final evaluation will be managed by the Executing Agency, supported by the Implementing Agency. Responsibilities will include developing terms of reference, procurement of the evaluation team, and management of the logistics, and ensuring reports are submitted on time.

**Table 20. Monitoring and Evaluation budget**

Type of M&E activities	Responsible Party	Timeframe	Reporting	Budget
State and Outer Island inception workshops and Reports	Project Manager	Within twelve months of commencement	Six-monthly reports	\$40,000
Measurement of baseline data <sup>43</sup>	PMU	Within twelve months of commencement	Six-monthly reports	n/a
Periodic progress reports	Project Manager	Bi-annual	Six-monthly progress reports	\$12,000
Compliance with ESM Plan	Project Manager	Bi-annual	Six-monthly progress reports	\$50,000

<sup>43</sup> Costs are incorporated into other monitoring activities

Compliance with Gender Plan	Project Manager	Bi-annual	Six-monthly progress reports	\$50,000
Community consultations	PMU	At least every six months	Six-monthly progress reports Site visit reports	\$144,400
Field site visits	PMU	At least every six months	Six-monthly progress reports Site visit reports	\$307,500
Monitor and review	Implementing Agency	At least every six months	Mission reports and evaluations	\$119,880
Mid-term Evaluation	Implementing Entity & Executing Entity	Mid-point of project	MTR Report	\$50,000
Final Evaluation	Implementing Entity & Executing Entity	End of project	Final evaluation report	\$60,000
Project terminal report	Implementing Entity & Executing Entity	End of project	Terminal report	\$40,000
<b>Total</b>				<b>\$873,780</b>

## E. Project Results Framework

The Project Results Framework consists of five outcomes and nine project outputs as outlined below.

Expected Result	Indicator	Baseline data	Targets	Source of Verification / Data collection methods	Frequency	Responsibility	Assumptions and Risks
<b>Project Objectives:</b>							
<ol style="list-style-type: none"> <li>1. Prepare the necessary institutional and regulatory frameworks, policies, guidance, and tools to help deliver a climate resilient FSM</li> <li>2. Strengthen water and livelihood security measures to help 6 outer atoll islands adapt to impacts of climate change related to water, health, and sanitation</li> <li>3. Provide communities with climate resilient infrastructure to help relocate from high risk coastal inundation sites</li> <li>4. Capture and share the local knowledge produced on climate change adaptation and accelerate the understanding about the kinds of interventions that work in island environments in FSM</li> </ol>							
<b>Component 1: Strengthening policy and institutional capacity for integrated coastal and water management at national, state levels and outer island levels</b>							
<b>Outcome 1:</b> Strengthened policy and institutional capacity of government to integrate climate risk and resilience into its water and coastal and marine management legislative, regulatory and policy frameworks	Number of national and state level stakeholders participating in EPA, R&D, NWTF meetings, planning and implementation of activities.  Number of regulatory framework drafts developed for water and coastal management regulations at state level	FSM regulations for development projects does not consider climate risks and resilience, with the exception of the Kosrae State Regulations for Development Projects 2014.  Existing water and coastal management policies lack consideration of existing climate change risk and disaster risk,	13 strategies or plans reviewed or developed by end of Project.	Stakeholder consultation reports.  Legal and regulatory policy assessment reports including recommendations.  Guidance documents on mainstreaming climate change into legislative and policy frameworks.  Policies or plans.  Policies or legislation adopted highlighting the uptake of the	Baseline, bi-annual, mid-term, final	Project Manager	<b>Assumptions:</b> Political will and commitment to encourage participation of key government stakeholders at national level.  Political will to adopt the guidance and recommendations within Departments.  <b>Risks:</b> Limited or no buy-in from national stakeholders.  Change of Government and priorities.

Expected Result	Indicator	Baseline data	Targets	Source of Verification / Data collection methods	Frequency	Responsibility	Assumptions and Risks
		and projected risks.  A framework for developing a water and sanitation policy, water outlook, and water sector investment plan exists but no plans that integrate climate risks and consider gender-sensitive approaches.		guidance and recommendations.			
<b>Output 1.1:</b> Legislation and policy paper to guide regulation of climate resilient coastal and marine management at national level	National-level legislation and policies reviewed to incorporate climate change considerations into marine and coastal management.  Guidance developed based on recommendations adoption of recommendations evident within relevant Departments.	No current and future climate risks mainstreamed into current legislation, regulation, policy and guidance documents for coastal and marine development projects in FSM.	At least one national coastal and marine management policy and legislation reviewed with recommendations and guidance developed on mainstreaming climate risk and resilience.  Recommendations adopted by at least one Department.	Stakeholder consultation reports.  Legal and regulatory policy assessment report including recommendations.  Guidance documents on mainstreaming climate change into legislative and policy frameworks.  Policies or legislation adopted highlighting the uptake of the	Baseline, bi-annual, mid-term, final	Project Manager	<b>Assumptions:</b> Political will and commitment to encourage participation of key government stakeholders at national level.  Political will to adopt the guidance and recommendations within Departments.  <b>Risks:</b> Limited or no buy-in from national stakeholders.

Expected Result	Indicator	Baseline data	Targets	Source of Verification / Data collection methods	Frequency	Responsibility	Assumptions and Risks
				guidance and recommendations.			Change of Government and priorities.
<b>Output 1.2:</b> State regulations for coastal and marine development projects amended to consider climate change risks and resilience measures	State-level legislation and policies reviewed to incorporate climate change considerations into marine and coastal management.  Guidance developed based on recommendations adoption of recommendations evident within relevant Departments.	No current and future climate risks mainstreamed into current legislation, regulation, policy and guidance documents for development projects in Yap, Chuuk and Pohnpei States.	At least one State coastal and marine management policy and legislation reviewed with recommendations and guidance developed on mainstreaming climate risk and resilience.  Recommendations adopted by at least one Department.	Stakeholder consultation reports.  Legal and regulatory policy assessment report including recommendations.  Guidance documents on mainstreaming climate change into legislative and policy frameworks.  Policies or legislation adopted highlighting the uptake of the guidance and recommendations.	Baseline, bi-annual, mid-term, final	Project Manager / Operations & Finance Officers	<b>Assumptions:</b> Political will and commitment to encourage participation of key government stakeholders at national level.  Political will to adopt the guidance and recommendations within Departments.  <b>Risks:</b> Limited or no buy-in from national stakeholders.  Change of Government and priorities.
<b>Output 1.3:</b> National Water and Sanitation Policy endorsed with climate and disaster risks and resilience, and gender mainstreamed	Completion of the National Water and Sanitation Policy. Endorsement of the National Water and Sanitation Policy.	No water and sanitation policy.	National Water and Sanitation Policy developed and ready for endorsement.	Stakeholder consultation reports.  National Water and Sanitation Policy. President and Government resolution on National Water & Sanitation Policy	Baseline, bi-annual, mid-term, final	Project Manager	<b>Assumptions:</b> Political will and commitment to developing a National WSP.  Strong Government leadership and support for development of the WSP.  <b>Risks:</b>

Expected Result	Indicator	Baseline data	Targets	Source of Verification / Data collection methods	Frequency	Responsibility	Assumptions and Risks
							Limited or no buy-in from Government and other stakeholders.
<b>Output 1.4:</b> State Water Outlook and Water Sector Investment Plan developed and implemented	Completion of the review and updates of the State Water Outlook and Water Sector Investment Plan.  Implementation of State Water Outlook and Water Sector Investment Plans.	No State Water Outlook and Water Sector Investment Plan in Yap, Chuuk and Pohnpei	State Water Outlook and Water Sector Investment Plans updated in 4 States.  WOSWIP implemented in at least one State.	Stakeholder consultation reports.  Water Outlook and Water Sector Investment Plans.	Baseline, bi-annual, mid-term, final	Project Manager, Operations & Finance Officers	<b>Assumptions:</b> Political will and commitment to updating the WOSWIPs.  Strong State leadership and support for development of the WOSWIP.  WOSWIP are already developed in all States and require updating.  <b>Risks:</b> Limited or no buy-in from State government stakeholders.
<b>Component 2: Demonstration of water security and sanitation measures in outer islands of Yap, Chuuk and Pohnpei</b>							
<b>Outcome 2a:</b> Water conservation and management technology and practices adopted, responding to drought, sea level rise and	Number of outer islands and its communities with increased storage capacity to store potable and grey water  Number of people (disaggregated by GSI categories)	Poorly maintained traditional water harvesting and conservation infrastructure and technology available. It cannot cope with the dry seasons.	By project end, at least 80% of households on the target outer islands have improved access to water through either new or repairs to current, water storage facilities.	Participatory evaluation report, survey report progress report developed by Municipal Government quarterly reporting  Data collected by the Island municipal	Baseline, bi-annual, mid-term, final	Project Manager, Operations & Finance Officers, Outer Island Coordinators	<b>Assumptions:</b> Household / Individuals accept the need to limit water usage  Maintenance plans can be implemented  <b>Risks:</b>

Expected Result	Indicator	Baseline data	Targets	Source of Verification / Data collection methods	Frequency	Responsibility	Assumptions and Risks
early recovery from cyclones	benefitting from interventions by the project.	No monitoring stations on island to collect and monitor rainfall data to advice on water conservation practices including advice on other sectors		government office through rain gauges (on water resources, quality, use and maintenance of water conservation and management technologies)  Water facility assessments			Theft of water resources  Logistical/transport problems and/or prohibitive costs leading to delays in arrival of people and/or materials (R2)
<b>Outcome 2b:</b> Appropriate sanitation measures for the outer islands of Yap, Chuuk and Pohnpei are determined for future investment	Educational & awareness programmes for the outer islands  Types of sanitation measures for participating outer islands	Existing sanitation measures are health-hazards to the communities	At least 1 WASH programme implemented in all 6 outer islands  At least two options for sanitation measures identified for the participating outer islands	WASH Programmes delivered in outer islands  Surveys  Sanitation options	Baseline, bi-annual, mid-term, final	Project Manager, Operations & Finance Officers, Outer Island Coordinators	<b>Assumptions:</b> Outer island communities will be willing to participate in developing and trialling the sanitation measures  Communities will participate in WASH programmes <b>Risks:</b> No community buy-in
<b>Output 2.1:</b> Outer island communities oriented to CC, SLR, and adaptive capacity measures involving water, health, sanitation and environment	Number of community trainings on climate change, sea-level rise, adaptation and resilience.  Number of people (disaggregated by GSI and other categories as	The six island sites have limited understanding of the impacts of climate change and sea level rise on the water, health, sanitation and environment sectors.	At least 60% of the community population in the six outer islands (of which close to 50% are women) are educated on the impacts of CC and SLR on water, health, sanitation and the environment, and	Review reports, stakeholder consultation reports  Stakeholder surveys and evaluations  Approved water conservation and management plans	Baseline, bi-annual, mid-term, final	Project Manager, Operations & Finance Officers, Outer Island Coordinators, Knowledge & Communication Officer	<b>Assumptions:</b> Community are receptive to training and are able to engage  <b>Risks:</b> Community engagement is low

Expected Result	Indicator	Baseline data	Targets	Source of Verification / Data collection methods	Frequency	Responsibility	Assumptions and Risks
	<p>appropriate, e.g. community members, local government etc) trained in climate change, sea-level rise, and adaptation and resilience measures.</p> <p>Number of people (disaggregated by GSI and other categories as appropriate, e.g. community members, local government etc) trained in the implementation of the water conservation and management plans.</p> <p>Completion of stakeholder consultations to review, improve and validate water conservation and management plans.</p> <p>Evaluation (feedback) by outer island community members on the value and</p>	<p>Limited knowledge and experience in the application of climate change information to adaptation planning in outer islands.</p>	<p>have their capacity enhanced to develop adaptation measures to address these impacts.</p> <p>At least 80% of those that participate in the above capacity building activities have acquired knowledge and skills to develop and implement adaptation plans and actions.</p>	<p>Communication materials for climate change, SLR, adaptation and resilience trainings</p> <p>Communication materials for water conservation and management plans</p>			

Expected Result	Indicator	Baseline data	Targets	Source of Verification / Data collection methods	Frequency	Responsibility	Assumptions and Risks
	effectiveness of the training.						
<b>Output 2.2:</b> Water Harvesting and Storage System (WHSS) repaired and installed in 6 atoll islands	<p>Completion of recommended improvements to current water infrastructure in six outer islands.</p> <p>Completion of installation of new rainwater harvesting systems in six outer islands.</p> <p>Number of infrastructure improvements by type, island and village supported by the project</p> <p>Number of people (disaggregated by GSI categories) benefitting from interventions installed by the project.</p>	<p>Water cisterns and tanks exist on the islands in poor conditions (leakages, contaminated), including poor guttering and down piping.</p> <p>There is no culture of maintenance of water harvesting systems at community level due to lack of specialised equipment and maintenance planning.</p>	<p>80% of households on the target outer islands have improved access to potable water from the WHSS.</p> <p>At least 20% of women, men and youth community groups on the outer islands are trained in the maintenance of community water harvesting and storage systems.</p>	<p>Reports on infrastructure assessments in the outer islands.</p> <p>Reports on numbers of facilities repaired and installed.</p> <p>Maintenance guides.</p> <p>Reports from community trainings.</p> <p>Community surveys</p>	Baseline, bi-annual, mid-term, final	Project Manager, Operations & Finance Officers, Outer Island Coordinators	<p><b>Assumptions:</b> Most households will benefit and have access to water facilities once installed</p> <p>Availability of skilled facilitators</p> <p>Community involvement including participation of women and elders</p> <p><b>Risks:</b> Logistical / transport problems and /or prohibitive costs leading to delays in arrival of people and /or materials</p> <p>Team/ island communication difficulties (e.g., only have shortwave radio)</p> <p>Unsuitable infrastructure (e.g., house roofs can't support catchment systems)</p>
<b>Output 2.3:</b> Assessment of viable	At least two options for sanitation have	Very limited awareness of WASH	Sanitation options are being tested and monitored in at	Reports, briefing notes, monitoring	Baseline, bi-annual,	Project Manager, Operations &	<b>Assumptions:</b> Availability of skilled facilitators

Expected Result	Indicator	Baseline data	Targets	Source of Verification / Data collection methods	Frequency	Responsibility	Assumptions and Risks
sanitation measures for outer islands in Yap, Chuuk and Pohnpei	<p>been identified and tested in the participating outer islands</p> <p>Number of people (disaggregated by GSI categories) benefitting from WASH (led by strategic partners including UNICEF, MYWSA and others to be identified) programs to which the project is contributing</p>	<p>techniques useful for application during drought periods and post-typhoon situations.</p> <p>Limited sanitation facilities with some facilities not used by communities. Currently the majority of people use the lagoon for toileting.</p> <p>The existing water-flushed toilets or pit-latrines are in poor condition, with leakage into soil and lagoon.</p> <p>Contamination / eutrophication of lagoon from excessive nutrient input from human waste</p>	<p>least 50% of the target outer islands</p> <p>At least 50% of people on the six outer islands have participated in the WASH programme</p>	<p>visit reports, real time study reports</p> <p>Completion of sanitation best practice review</p> <p>Completion of a sanitation options menu</p> <p>Completion of installation of solutions based on the menu.</p> <p>Emerging outcomes will be identified through monitoring visits and possibly a real time evaluative study.</p>	mid-term, final	Finance Officers, Outer Island Coordinators	<p>Community involvement including participation of women and elders</p> <p><b>Risks:</b> Logistical / transport problems and /or prohibitive costs leading to delays in arrival of people and /or materials</p> <p>Accessibility to labs to validate soil and lagoon monitoring tests</p> <p>Team/ island communication difficulties (e.g., only have shortwave radio)</p>
<b>Component 3: Demonstration of Kosrae Inland Road Relocation Initiative</b>							

Expected Result	Indicator	Baseline data	Targets	Source of Verification / Data collection methods	Frequency	Responsibility	Assumptions and Risks
<p><b>Outcome 3:</b> Increased resilience of coastal communities and environment to adapt to coastal hazards and risks induced by climate change</p>	<p>Number of women, men and youth benefiting from the access provided by inland road</p> <p>Number of women, men and youth benefiting from coastal defences</p>	<p>Malem-Utwe coastal road highly exposed to severe coastal erosion and is in high risk of being washed away within the next 10 -30 years</p> <p>Unsealed inner road limits access of communities inland</p>	<p>One road design produced in line with best practice.</p> <p>At least 80% of the inhabitants of Malem and Utwe (20-75 years age group) feel they have increased coastal resilience to inundation and erosion.</p>	<p>Road design report and survey results.</p> <p>Stakeholder surveys</p> <p>Training / information session reports and evaluations</p>	<p>Bi-annual, mid-term, final</p>	<p>Project Manager, Kosrae Operations &amp; Finance Officer</p>	<p>Island stakeholders and key players (e.g.: Kosrae State Government) have a high interest in, support for, and engagement in capacity building activities in Kosrae.</p> <p>Political will and commitment from the community and government</p> <p>Continuous support provided by the government and development partners.</p>
<p><b>Output 3.1:</b> Malem - Utwe inland road and access routes designed for future construction</p>	<p>Design for construction of the road completed to best practice.</p>	<p>No road or design for a new road exists</p>	<p>A completed road design that includes all climate risks and resilience aspects as well as consideration for all essential utility requirements.</p> <p>Financing of the road construction is achieved.</p>	<p>Consultant reports</p> <p>Road design report and survey results.</p>	<p>Bi-annual, mid-term, final</p>	<p>Project Manager, Kosrae Operations &amp; Finance Officer</p>	<p><b>Assumptions:</b> Procurement process will follow FSM Government procurement processes</p> <p>Procurement process will be undertaken by experienced personnel</p> <p><b>Risks:</b> Design will raise inclusions beyond the budget allocation</p>

Expected Result	Indicator	Baseline data	Targets	Source of Verification / Data collection methods	Frequency	Responsibility	Assumptions and Risks
							Consultants may not be experienced in road design in this type of geographical and climate location
<b>Output 3.2:</b> Transitional coastal protection at Mosral and Paal upgraded for immediate coastal protection	Coastal revetment design completed to best practice  Length (in kilometres/miles) of coastline revetment  Number of women, men and youth participating and engaged in community-based ecosystem management and trainings	Ineffective loose boulder defences at Mosral and Paal patched only after extreme events  Limited replanting has been undertaken near waterways and on coastal strip. Replanting will need to be undertaken post the construction of coastal walls	Mosral and Paal coastline protected in the order of 2.5 km or 1.6 miles  At least 50% of communities have participated in replanting and land stabilisation schemes	DT&I reports  Consultant / engineer reports on design  Concrete evidence of coastal protection e.g. photographs, construction reports  Activity reports Participant lists Community surveys Photos / videos	Baseline, bi-annual, mid-term and final	Project Manager, Kosrae Operations & Finance Officer	<b>Assumptions:</b> Procurement process will be undertaken by experienced personnel  KSG is able to fund maintenance of the transitional defences  <b>Risks:</b> The coastal defence work may cost more than the budget allocation due to unknown costs, problems or changes to the scope and scale
<b>Component 4: Knowledge management for improved water and coastal protection</b>							
<b>Outcome 4:</b> Capacity and knowledge enhanced and developed to improve management of water and coastal sectors to adapt to climate change	Number of awareness materials on climate change, sea-level rise, vulnerability, and adaptive capacity prepared in local language and distributed to	Programs carried out by various stakeholders (government, private sectors, and academic institutions) in the Outer Islands are not consolidated	At least 60 awareness and knowledge management products on the project results are produced and disseminated to stakeholders.	Site/field visits and surveys.  Project reports  Project monitoring and evaluation reports.  Project monitoring and evaluation	Baseline, bi-annual, mid-term, final	Project Manager, Knowledge & Communication Officer, Kosrae Operations & Finance Officer and Outer Island Coordinators	<b>Assumptions:</b> Local capacity exists to produce training materials that are of a high standard.  Strong island and community interest in, support for, and engagement in

Expected Result	Indicator	Baseline data	Targets	Source of Verification / Data collection methods	Frequency	Responsibility	Assumptions and Risks
	<p>community and other stakeholders.</p> <p>Number of success stories developed and shared on briefs, brochures, pamphlets, posters prepared and distributed.</p> <p>Number of men, women and youth participating in trainings and planning meetings.</p>	<p>and implemented under island development plans that exist.</p> <p>No systematic approach to awareness of opportunities and issues around climate change in outer islands and community / municipal government levels</p> <p>There is lack of gender-sensitized management and execution of climate-related projects and programs.</p> <p>The approaches with existing projects are only in pilot and in silo approaches without integration across program planning.</p>	<p>At least eight success stories or knowledge products generated on lessons learned and best practices have been produced, published, and shared with targeted stakeholders each project year</p> <p>At least 50% of perception responses (at least 50% are from women) to significant level of awareness and acknowledgement of gender and climate change benefits – compliance with natural resource management and gender dimensions of climate change</p>	<p>reports documenting lessons learned and good practices in climate change mainstreaming that comprehensively addresses gender</p> <p>Independent evaluation reports</p> <p>Training evaluation reports</p>			<p>capacity building activities in the Outer Islands of each State.</p> <p><b>Risks:</b> Locally available printing, video and audio production capacity</p>
<b>Output 4.1:</b> Resource	Completion of recruitment of	No project awareness	By the end of the Project, at least 60	Executed contract or workplan,	Baseline, bi-annual,	Project Manager,	<b>Assumptions:</b>

Expected Result	Indicator	Baseline data	Targets	Source of Verification / Data collection methods	Frequency	Responsibility	Assumptions and Risks
materials developed, tailored to local context, translated, published and shared amongst various stakeholders	<p>Knowledge and Communication Officer</p> <p>Completion of project-level knowledge management strategy</p> <p>Number of practical information products made by the project (by type and intended audience)</p> <p>Number of public communications of results and information made by the project (by type and intended audience)</p> <p>Number of Project-related reports in local media</p> <p>Completion of data management plan/roadmap</p> <p>Completion of data systems integration</p> <p>Completion of sustainability plan for integrated data system</p>	<p>materials have been developed or made available</p> <p>No data management strategy is in place.</p>	<p>awareness and knowledge management products on the project results are produced and disseminated to stakeholders</p> <p>At least 1 inter-state or south-south exchanges on lessons learned and best practices on practical island interventions</p> <p>An accessible project data management and storage system with the complete Project history, results and knowledge products developed and maintained by DECM</p>	<p>strategy document, information products</p> <p>Data management agreements with partners, plans, reports, guidance documents</p>	mid-term, final	Knowledge & Communication Officer, Kosrae Operations & Finance Officer and Outer Island Coordinators	<p>No delays in the recruitment process(es)</p> <p><b>Risks:</b> Logistical / transport problems and /or prohibitive costs leading to delays in arrival of people and /or materials</p> <p>Team/ island communication difficulties (e.g., only have shortwave radio)</p>

## F. Alignment with the Results Framework of the Adaptation Fund

Project Objective(s) <sup>44</sup>	Project Objective Indicator(s)	Fund Outcome	Fund Outcome Indicator	Grant Amount (USD)
Project Objective 1: Prepare the necessary institutional and regulatory frameworks, policies, guidance, and tools to help deliver a climate resilient FSM	Number of institutional, regulatory, and planning guidance, frameworks and tools introduced to implement climate resiliency for all FSM States	Outcome 7. Improved policies and regulations that promote and enforce resilience measures	7. Climate change priorities are integrated into national development strategy	\$600,900
Project Objective 2: Strengthen water and livelihood security measures to help 6 outer atoll islands adapt to impacts of climate change related to water, health, and sanitation	Number of risk-exposed communities in Yap, Pohnpei and Chuuk protected through adaptation measures	Outcome 3: Strengthened awareness and ownership of adaptation and climate risk reduction processes at local level	3.1. Percentage of targeted population aware of predicted adverse impacts of climate change, and of appropriate responses  3.2. Modification in behaviour of targeted population	\$365,600
		Outcome 4. Increased adaptive capacity within relevant development and natural resource sectors	4.2. Physical infrastructure improved to withstand climate change and variability-induced stress	\$2,459,400
		Outcome 5. Increased ecosystem resilience in response to climate change and variability-induced stress	5. Ecosystem services and natural assets maintained or improved under climate change and variability-induced stress	\$275,413
Project Objective 3: Provide communities with climate resilient infrastructure to help	Number and length of climate adaptive infrastructure designed and constructed in Kosrae	Outcome 4: Increased adaptive capacity within relevant development	4.2. Physical infrastructure improved to withstand climate change and variability-induced stress	\$3,374,000

<sup>44</sup> The AF utilized OECD/DAC terminology for its results framework. Project proponents may use different terminology, but the overall principle should still apply

relocate from high risk coastal inundation sites		and natural resource sectors		
Project Objective 4: Capture and share the local knowledge produced on climate change adaptation and accelerate the understanding about the kinds of interventions that work in island environments in FSM	Number of knowledge products developed and number of men, women and youth trained on climate change, sea-level rise, vulnerability and adaptive capacity	Outcome 3: Strengthened awareness and ownership of adaptation and climate risk reduction processes at local level	3.1. Percentage of targeted population aware of predicted adverse impacts of climate change, and of appropriate responses  3.2. Modification of behaviour in targeted population	\$431,600
<b>Project Outcome(s)</b>	<b>Project Outcome Indicator(s)</b>	<b>Fund Output</b>	<b>Fund Output Indicator</b>	<b>Grant Amount (USD)</b>
Outcome 1: Strengthened policy and institutional capacity of government to integrate climate risk and resilience into its water and coastal and marine management legislative, regulatory and policy frameworks	Number of national and state level stakeholders participating in EPA, R&D, NWTF meetings, planning and implementation of activities.  Number of regulatory framework drafts developed for development projects regulations at state level	Output 7: Improved integration of climate-resilience strategies into country development plans	7.1. No., type, and sector of policies introduced or adjusted to address climate change risks  7.2. No. or targeted development strategies with incorporated climate change priorities enforced	\$600,900
Outcome 2a: Water conservation & management technology and practices adopted responding to drought, sea level rise and early recovery from cyclones	No. of demonstrations on climate change, sea-level rise and adaptive capacity measures involving water, health, sanitation, and environment undertaken on the outer islands.  No. of population in the outer islands trained in climate change, sea-level rise, and adaptive capacity measures.  Demonstrated increase in understanding of climate change, sea-level rise, and adaptive	Output 3: Targeted population groups participating in adaptation and risk reduction awareness activities	3.1.1. Number and type of risk reduction actions or strategies introduced at local level  3.1.2. No. of news outlets in the local press and media that have covered the topic	\$365,600

	capacity measures in communities in the outer islands.			
	No. of water storage facilities improved or constructed.  Storage capacity for potable and grey water at household and community level increased.	Output 4: Vulnerable physical, natural, and social assets strengthened in response to climate change impacts, including variability	4.1.2. No. of physical assets strengthened or constructed to withstand conditions resulting from climate variability and change (by asset type)	\$2,459,400
	Rainfall data collected on a monthly basis used to provide advice on water conservation practices and advice on other development sectors (farming, fishing, etc.).  Water conservation and management plans in place on the outer islands of Yap, Chuuk and Pohnpei.  Water quality monitoring programme in place and improvement in water quality demonstrated.	Output 5. Vulnerable physical, natural, and social assets strengthened in response to climate change impacts, including variability	5.1. No. and type of natural resource assets created, maintained, or improved to withstand conditions resulting from climate variability and change (by type of assets)	
Outcome 2b: Appropriate sanitation measures for the outer islands of Yap, Chuuk and Pohnpei are determined for future investment	Number of sanitation measures assessed and piloted in outer islands in Yap, Chuuk and Pohnpei.  Number of WASH trainings undertaken on the outer islands.  Demonstration of changed behaviour on WASH in targeted Population.	Output 3: Targeted population groups participating in adaptation and risk reduction awareness activities	3.1.1. Number and type of risk reduction actions or strategies introduced at local level  3.1.2. No. of news outlets in the local press and media that have covered the topic	\$275,413
Outcome 3: Increased resilience of coastal communities and environment to adapt to	Best practice road design developed and no. of people who will benefit from future construction of the road.	Output 4: Vulnerable physical, natural, and social assets strengthened in	4.1.2. No. of physical assets strengthened or constructed to withstand conditions resulting from	\$3,374,000

coastal hazards and risks induced by climate change	No. of people benefiting from the construction of coastal defences.	response to climate change impacts, including variability	climate variability and change (by asset types)	
Outcome 4: Capacity and knowledge enhanced and developed to improve management of water and coastal sectors to adapt to climate change	<p>No. of awareness materials on climate change, sea-level rise, vulnerability, and adaptive capacity prepared in local language and distributed to community and other stakeholders.</p> <p>Number of project success stories developed and shared.</p> <p>Number of men, women and youth participating in trainings and planning meetings.</p> <p>Demonstrated increase in understanding of climate change, sea-level rise and adaptive capacity measures in communities in the outer islands.</p>	Output 3: Targeted population groups participating in adaptation and risk reduction awareness activities	<p>3.1.1 No. and type of risk reduction actions or strategies introduced at local level</p> <p>3.1.2. No. of news outlets in the local press and media that have covered the topic</p>	\$431,600

**Table 20. Alignment with Adaptation Fund Core Indicators**

Adaptation Fund Core Indicators	Indicative Targets	Comments
1. Number of beneficiaries	<p>Direct beneficiaries: 5,536 (Female: 2,803; Male: 2,727)</p> <p>(Outputs 2.1, 2.2, 2.3, 3.2 and 4.1)</p>	This only counts direct beneficiaries in the six target outer islands and Kosrae State (Malem and Utwe) who will benefit from the water security measures, coastal protection measures and training, awareness raising exercises and sessions. It does not include indirect beneficiaries. Beneficiaries are based on population (male and female) under the 2010 Census.
3.1. Percentage of targeted population aware of predicted adverse impacts of climate change, and of appropriate responses	At least 50% of participants are either partially aware, mostly aware or fully aware of	Includes populations of the six outer islands (Woleai, Eauripik, Satawan, Lukunor, Kapinga, Nukuoro) only and is based on 50% of the participants attending trainings and information

	the climate change impacts and adaptation measures (Outputs 2.1 and 4.1)	sessions perceiving a shift in their level of understanding and awareness of climate change impacts and adaptation measures to build resilience.
3.1.1. Number and type of risk reduction actions or strategies introduced at local level	At least 80% of households in target outer islands have improved access to water (Output 2.2)  13 strategies or plans reviewed (Output 1.1, 1.2 and 1.3)	The implementation of water security strategies / actions will provide increased water storage capacity and improved water quality to the communities in the target outer islands. This action is linked to the repair, maintenance, and installation of infrastructure under Output 2.2 and will include training in the maintenance of infrastructure and water management.  The strategies and plans will be at the national and state levels and ensure climate risk and resilience is incorporated into strategies and plans for water, marine and coastal development. This will support national and state level authorities to better plan and mitigate against climate impacts in these sectors.
3.1.2. No. of news outlets in the local press and media that have covered the topic	At least 10 news outlets covering the topics by project end  60 awareness and knowledge management products produced by project end (Output 4.1)	This will be implemented through the knowledge management and communication activities of the project and be at the national, state, and local levels. In addition, some media will have an external reach through regional and international channels via social media, project partner networks and south-south exchanges.
3.2. Modification in behaviour of targeted population	At least 50% of the population in the six outer islands have changed their behaviour through implementation of WASH Programmes (Output 2.3 and 4.1)	The WASH Programmes are designed to raise awareness, educate and train communities on water, sanitation and health. These programmes will be implemented in partnership with UNICEF WASH in the target outer islands.
4.2. Physical infrastructure improved to withstand climate change and variability-induced stress	Water storage infrastructure is 'mostly improved' to 'fully improved' in at least five target outer islands (Output 2.2)	The implementation of water security strategies / actions will provide increased water storage capacity and improved water quality to the communities in the target outer islands. This action is linked to the repair, maintenance, and installation of infrastructure under Output 2.2 and will include training in the maintenance of infrastructure and water management.
4.1.2. No. of physical assets strengthened or constructed to withstand conditions resulting from climate variability and change (by asset type)	At least 50% of identified water infrastructure on the outer islands improved or constructed by project end	The number and type of water infrastructure to be improved or constructed will be identified during the outer island water assessments.

	(Output 2.2)  One coastal protection measure (i.e. coastal wall) constructed (Output 3.2)	Coastal protection measures are to be constructed in Kosrae State only under Output 3.2. This includes the construction of protection measures and implementation of soft adaptation measures e.g. vegetation replanting.
5. Ecosystem services and natural assets maintained or improved under climate change and variability-induced stress	Project actions to improve water quality within lagoon areas on outer islands have been moderately effective (Outputs 2.1, 2.2 and 2.3)	The ecosystem service of water provisioning and improved water quality will be measured through ongoing monitoring conducted in the outer islands.
5.1. No. and type of natural resource assets created, maintained, or improved to withstand conditions resulting from climate variability and change (by type of assets)	1 natural resource asset (water) improved and maintained (Output 2.2)	The water asset for the outer island communities will be created, maintained, or improved through new or reconditioned water storage facilities i.e. water tanks. In the majority of cases, this will involve repairing and reconditioning of water tanks. The outcome will be increased water storage capacity for the communities. Training in water safety and water management will be undertaken to ensure ongoing maintenance of the infrastructure
7. Climate change priorities are integrated into national development strategy	13 strategies or plans reviewed  At least 2 guidance guidelines developed (Outputs 1.1, 1.2 and 1.3)	FSM regulations for development do not currently consider climate risks and resilience. The review, recommendations, guidance, and strategy development will ensure climate risks and resilience are incorporated into the water, marine and coastal sectors.
7.1. No., type, and sector of policies introduced or adjusted to address climate change risks	1 national policy developed on water and sanitation  4 State water outlooks and water investment plans developed	
7.2. No. or targeted development strategies with incorporated climate change priorities enforced	13 strategies or plans integrating climate risk and resilience in the water and coastal sectors reviewed and / or developed	

## G. Project Budget

Include a detailed budget with budget notes, a budget on the Implementing Entity management fee use, and an explanation and a breakdown of the execution costs.

**Table 29. Budget**

Component	Activity	Year 1 2018	Year 2 2019	Year 3 2020	Year 4 2021	Year 5 2022	2023	TOTAL (\$, USD)	
<b>Component 1. Strengthening policy and institutional capacity for integrated coastal and water management at national, state and outer island levels</b>	<b>Output 1.1: Legislation and policy paper to guide regulation of climate resilient coastal and marine management at national level</b>								
	1.1.1	Review of National-level legislation and policies for: (i) infrastructure to identify climate change requirements and (ii) regulatory and policy framework for climate change	45,000	22,500 79,250	22,500 34,250	7,500 28,500	7,500		75,000 142,000
	1.1.2	Develop guidance based on recommendations from the review of coastal and marine management legislation and policy and monitor progress of recommendation uptake through relevant Departments	6,000	9,000	9,000	3,000	3,000		30,000 0 (costs incorporated into 1.1.1)
	1.1.3	Develop policy guidance documents for national and states	1,000	1,500	1,500	500	500		5,000
	1.1.4	Endorse and adopt regulations, policy and guidance documents established for national and state levels	5,000	7,500	7,500	2,500	2,500		25,000
	1.1.5	Lobby and advocate regulation and policy changes in media campaign and public awareness activities	1,000	1,500	1,500	500	500		5,000
	1.1.6	Monitor and report feedback and progress	2,000	3,000	3,000	1,000	1,000		10,000
	<b>Output 1.2: State regulations for coastal and marine development projects amended to consider climate change risks and resilience measures</b>								
	1.2.1	Review of State-level legislation and policies for infrastructure to identify climate change requirements.	5,000	7,500	7,500 72,400	2,500 70,900	2,500		25,000 143,300
	1.2.2	Develop guidance based on recommendations from the review of coastal and marine management legislation and policy) and monitor progress of recommendation uptake through relevant	10,000	15,000	15,000	5,000	5,000		50,000 0 (costs incorporated into 1.2.1)
	1.2.3	Initiate development of regulations, policy and guidance documents identified and adopt institutional changes to existing arrangements.	4,000	6,000	6,000	2,000	2,000		20,000

	1.2.4	Endorse and adopt regulations, policy and guidance documents established for national and state	12,000	18,000	18,000	6,000	6,000		60,000
	1.2.5	Lobby and advocate regulation and policy changes in media campaign and public awareness activities	2,000	3,000	3,000	1,000	1,000		10,000
	1.2.6	Monitor and report feedback and progress	2,000	3,000	3,000	1,000	1,000		10,000
	<b>Output 1.3: State Water Outlook and Water Sector Investment Plan developed and implemented</b>								
	1.3.1	Support the implementation of State-level Water Outlook and Investment Plans	12,400	18,600	18,600	6,200	6,200	67,000	62,000 315,600
	1.3.2	Preparation of the National Water and Sanitation Policy	13,200	19,800	19,800	6,600	6,600		66,000
	<b>Output 1.4: National Water Outlook and Water Sector Investment Plan developed and implemented</b>								
	1.4.1	Implementation of the NOW Programme	-31,464	-47,196	-47,196	-15,732	-15,732		-157,321
	1.4.2	Implementation of the Water Sector Investment Plan (WSIP) Programme	-31,464	-47,196	-47,196	-15,732	-15,732		-157,321
	<b>Total: Component 1</b>			<b>79,250</b>	<b>199,450</b>	<b>183,200</b>	<b>72,000</b>	<b>67,000</b>	<b>767,642</b> <b>600,900</b>
<b>2. Demonstration of water security measures in outer islands of Yap, Chuuk and Pohnpei</b>	<b>Output 2.1: Outer island communities oriented to CC, SLR, and adaptive capacity measures involving water, health, sanitation and environment</b>								
	2.1.1	Arrangements for demonstrations of water and sanitation technologies	-20,620	-10,310	-30,930	-30,930	-10,310		-103,100 365,600
	2.1.2	Carry out ground-truthing assessments	-36,427	-18,213	-54,640	-54,640	-18,213		-182,133
	<b>Output 2.2 Water Harvesting and Storage System (WHSS) repaired and installed in 6 atoll islands</b>								
	2.2.1	Carry out ground-truthing assessments	53,342	26,671	80,013	80,013	26,671		266,709 102,400
	2.2.2	Repairing household rainwater harvesting and storage system.	117,227	58,613	175,840	175,840	58,613		586,135 1,558,000
	2.2.3	Constructing community rainwater harvesting and storage systems.	38,360	19,180	57,541	57,541	19,180		191,802 396,500
	2.2.4	Implementation of a monitoring and maintenance programme		63,000	164,500	130,000	36,500	8,500	402,500
	<b>Output 2.3: Assessment of viable sanitation measures for outer islands in Yap, Chuuk and Pohnpei</b>								
	2.3.1	Sanitation measures assessed and piloted in outer islands in Yap, Chuuk and Pohnpei	27,180	13,590	40,770	40,770	13,590	17,000	135,904 275,413
2.3.2	Constructing self-composting toilets – using plans (1 unit each per gender)	86,458	43,229	129,688	129,688	43,229		432,292	

	2.3.3	Training on WASH and water conservation practices in school and communities	18,413	9,207	27,620	27,620	9,207		92,066
	2.3.4	Monitoring and care after	14,544	7,272	21,817	21,817	7,272		72,722
	<b>Output 2.4: 3, 253 people trained on water conservation and management including coastal protection and livelihoods in 6 outer islands</b>								
	2.4.1	Selecting stakeholders (men, women, youth) for training	-	-	-	-	-		-
	2.4.22	Organizing training in water data collection and quality testing and survey developments	18,692	9,346	28,038	28,038	9,346		93,459
	2.4.33	Organizing training in construction, operations and maintenance of systems	21,128	10,564	31,692	31,692	10,564		105,641
	2.4.44	Monitoring and maintenance / after care of harvesting systems	12,190	6,095	18,285	18,285	6,095		60,952
	<b>Output 2.5: Teacher's Guide on Climate Change developed to enhance climate change learning in FSM schools and training institutions</b>								
	2.5.1	Organizing climate change education planning workshops	3,836	1,918	5,754	5,754	1,918		19,181
	2.5.2	Develop Teacher's Guide on Climate Change in English and translation in six main island languages	14,000	7,000	21,000	21,000	7,000		70,000
	2.5.3	Training of Trainer's / Teachers on Teacher's Guide on Climate Change.	5,754	2,877	8,631	8,631	2,877		28,771
	2.5.4	Implement Teacher's Guide in Schools	3,836	1,918	5,754	5,754	1,918		19,181
	2.5.5	Monitoring effectiveness of Teacher's Guide development system, and Guide itself	3,836	1,918	5,754	5,754	1,918		19,181
	<b>Total: Component 2</b>			<b>248,600</b>	<b>1,838,200</b>	<b>712,363</b>	<b>275,750</b>	<b>25,500</b>	<b>2,479,225</b> <b>3,100,413</b>
<b>3. Demonstration of Kosrae Inland Road Relocation Initiative</b>	<b>Output 3.1: Malem - Utwe inland road and access routes designed for future construction</b>								
	3.1.1	Survey and design road and related infrastructure to ensure climate change resilience	300,547	901,642 579,000	901,642 209,000	751,369	450,274		3,005,474 788,000
	<b>Output 3.2: Transitional coastal protection at Mosral and Paal upgraded for immediate coastal protection</b>								
	3.2.1	Upgrade coastal protection works	31,500	94,500	94,500 536,000	78,750 1,541,000	15,750 509,000		315,000 2,586,000
	<b>Output 3.3: State support program to access land in upland areas established</b>								
	3.3.1	Land consultations, surveys, mapping and regulatory framework for future inland movement of vulnerable coastal people and infrastructure	5,500	16,500	16,500	13,750	2,750		55,000
<b>Output 3.4: Community-Based Ecosystem Management strengthened</b>									

		-								
3.4.1	Plusrik / Kuplu Wan water shed protection strategy, native vegetation buffer zones and stream health monitoring programme to strengthen sustainable use of upland areas	40,500	31,500	31,500	26,250	5,250		105,000		
<b>Output 3.5: Develop state program to assist access to finance for vulnerable households established</b>										
3.5.1	Preparation of support programme for accessing finance, Identify options and Kosrae workshops for developing financial incentive mechanisms to support upland residential development to complement existing programmes/schemes in Kosrae providing access to finance	4,000	12,000	12,000	10,000	2,000		40,000		
<b>Total: Component 3</b>			579,000	745,000	1,541,000	509,000		<b>3,520,474</b> <b>3,374,000</b>		
<b>4. Knowledge management for improved water and coastal protection</b>	<b>Output 4.1: Resource materials developed, tailored to local context, translated, published and shared amongst various stakeholders</b>									
	4.1.1	Undertake knowledge management, communication and engagement activities	6,632	13,264 25,000	19,895 89,800	13,264 99,800	13,264 73,000	48,000	66,318 335,600	
	4.1.2	Capture and document data and information generated by the project	10,523	21,046	31,569 24,000	21,046 24,000	21,046 24,000	24,000	105,230 96,000	
	4.1.3	Share and disseminate to partners and stakeholders	3,378	6,757	10,135	6,757	6,757		33,785	
	<b>4.2 Resource materials developed, tailored to local context, translated, published and shared amongst various stakeholder</b>									
	4.2.1	Capture and document information generated by the project	9,602	19,205	28,807	19,205	19,205		96,024	
	4.2.2	Organizing consultancy support to edit scientific and peer reviewed knowledge products from the project	8,060	16,120	24,180	16,120	16,120		80,604	
	4.2.3	Print, publish, produce and share materials through public awareness and media campaigns	6,232	12,464	18,695	12,464	12,464		62,318	
	<b>4.3 Stakeholders brought together to share, learn and exchange knowledge and skills on climate change, adaptation planning, monitoring, vulnerability assessments and climate change</b>									
	4.3.11	Trainings on climate change, sea level rise and adaptive capacity measures on water and coastal sectors	29,529.6	59,059	88,589	59,059		59,059	295,296	
<b>Total: Component 4</b>			25,000	113,800	123,800	97,000	72,000	<b>739,571</b> <b>431,600</b>		
<b>Total Components (1- 4)</b>		<b>1,063,113.1</b> <b>0</b>	<b>1,678,413.2</b> <b>931,850</b>	<b>2,252,073.9</b> <b>2,896,450</b>	<b>1,852,423.0</b> <b>2,560,363</b>	<b>953,750</b>	<b>660,889.7</b> <b>164,500</b>	<b>7,506,913</b> <b>7,506,913</b>		

<b>5. Project Execution Cost (B)</b>	5.1	Salary of Project Staff	50,000 48,220	147,764 140,000	147,768 140,000	147,768 140,000	140,000	147,768	641,068 608,220
	5.2	Financial Audit	-	11,099 11,000	11,098 11,000	11,098 11,000	11,000	11,098	44,393 44,000
	5.3	Operating Costs	24,000	1,200 19,500	700 8,000	650 2,000	2,500	1,700 1,098	28,250 33,098
	5.4	Bi-annual Meeting Costs	-	-	7,500	-		7,500	15,000
	5.5	Workshops / Forums	1,300	900 5,700	1,300	900		1,300	5,700 5,700
	5.66	Monitoring & Evaluation	-	-	26,735	-		50,000	26,735 50,000
	5.77	Terminal Evaluation Costs	-	-	-	-		26,872	26,872
		<b>Total Project Execution Cost (5)</b>	<del>75,300.0</del> 48,220	<del>160,963.0</del> 185,200	<del>195,101.0</del> 168,000	<del>160,416.0</del> 162,000	163,500	<del>196,238.0</del> 61,098	<del>788,018</del> 788,018
<b>6. Total Project Cost</b>			<del>1,150,678</del> 48,220	<del>1,843,234.6</del> 1,117,050	<del>2,447,148.8</del> 3,064,450	<del>2,008,980.6</del> 2,722,363	1,117,250	<del>844,862.77</del> 225,598	<del>8,294,931</del> 8,294,931
<b>7. Regional Implementing Entity Fee (RIE Fee)</b>			<del>97,807.6</del> 97,808	<del>156,674.99</del> 156,675	<del>208,009.88</del> 208,010	<del>170,763.33</del> 231,400	11,176	<del>71,813.33</del>	<del>705,069</del> 705,069
<b>8. Amount of Financing Requested from AFB</b>			<del>1,248,485.6</del> 146,028	<del>199,909.5</del> 2,683,725	<del>2,655,184.7</del> 3,272,459	<del>2,179,743.9</del> 2,953,763	1,128,425	<del>916,676.00</del> 225,598	<del>9,000,000</del>

## Project Management Budget

Detailed Budget (in US\$)								
Budget Categories	2018	2019	2020	2021	2022	2023	Total Category	Total
	USD	USD	USD	USD	USD	USD	USD	USD
Project Staff: Project Manager	24,220.00	30,000.00	30,000.00	30,000.00	30,000.00	-	144,220.00	608,220.00
Accountant	12,000.00	18,000.00	18,000.00	18,000.00	18,000.00	-	84,000.00	
Knowledge & Communication Officer	12,000.00	12,000.00	12,000.00	12,000.00	12,000.00	-	60,000.00	
Operations and Finance Officer (Kosrae)	-	14,000.00	14,000.00	14,000.00	14,000.00	-	56,000.00	
Operations and Finance Officer (Pohnpei)	-	14,000.00	14,000.00	14,000.00	14,000.00	-	56,000.00	
Operations and Finance Officer (Chuuk)	-	14,000.00	14,000.00	14,000.00	14,000.00	-	56,000.00	
Operations and Finance Officer (Yap)	-	14,000.00	14,000.00	14,000.00	14,000.00	-	56,000.00	
Outer Island Coordinator (Woleai)	-	4,000.00	4,000.00	4,000.00	4,000.00	-	16,000.00	
Outer Island Coordinator (Eauripik)	-	4,000.00	4,000.00	4,000.00	4,000.00	-	16,000.00	
Outer Island Coordinator (Satawan)	-	4,000.00	4,000.00	4,000.00	4,000.00	-	16,000.00	
Outer Island Coordinator (Lukunor)	-	4,000.00	4,000.00	4,000.00	4,000.00	-	16,000.00	
Outer Island Coordinator (Nukuoro)	-	4,000.00	4,000.00	4,000.00	4,000.00	-	16,000.00	
Outer Island Coordinator (Kapinga)	-	4,000.00	4,000.00	4,000.00	4,000.00	-	16,000.00	
<b>Sub-Total (Salaries)</b>	<b>48,220.00</b>	<b>140,000.00</b>	<b>140,000.00</b>	<b>140,000.00</b>	<b>140,000.00</b>	<b>-</b>	<b>608,220.00</b>	<b>608,220.00</b>
Travel		9,000.00	9,000.00	9,000.00	10,000.00	10,000.00	47,000.00	179,798.00
Monitoring and Evaluation						50,000.00	50,000.00	
Equipment / Office Supplies		18,500.00	6,000.00				24,500.00	
Consumables		1,000.00	2,000.00	2,000.00	2,500.00	1,098.00	8,598.00	
Audit		11,000.00	11,000.00	11,000.00	11,000.00		44,000.00	
Workshops / Forums		5,700.00					5,700.00	
Project Steering Committee							-	
<b>Sub-Total (Admin Expenses)</b>	<b>-</b>	<b>45,200.00</b>	<b>28,000.00</b>	<b>22,000.00</b>	<b>23,500.00</b>	<b>61,098.00</b>	<b>179,798.00</b>	<b>179,798.00</b>
	<b>48,220.00</b>	<b>185,200.00</b>	<b>168,000.00</b>	<b>162,000.00</b>	<b>163,500.00</b>	<b>61,098.00</b>	<b>788,018.00</b>	<b>788,018.00</b>

## Implementing Agency Fee

	AF costs for IA fees	Budget estimates (USD)
<b>Project Development</b>		
1	Develop, appraise and finalize project proposal , including mission travel; Project planning workshop	141,014.00
<b>Sub-Total</b>		<b>141,014.00</b>
<b>Implementation and Supervision</b>		
2	Finalize project implementation arrangements, technical assistance, supervision missions, monitoring and reporting, procurement and financial management, Audits, mid-term review	426,700.00
<b>Sub-Total</b>		<b>426,700.00</b>
<b>Completion and Evaluation</b>		
3	Oversee the preparation of the project completion report/independent terminal, evaluation and project closing, financial closure	75,605.00
<b>Sub-Total</b>		<b>75,605.00</b>
<b>IA Systems Support</b>		
4	Legal, IT, core costs	61,750.00
<b>Sub-Total</b>		<b>61,750.00</b>
<b>IA FEE: TOTAL</b>		<b>705,069.00</b>

## H. Disbursement Schedule

	Upon signature of Agreement	One Year after Project start	Year 2	Year 3	Year 4	Year 5	Total (USD)
Scheduled date	April 2017	13 March 2019	13 March 2020	13 March 2021	13 March 2022	13 March 2023	
Project Funds	1,150,678.00	1,843,235.00	2,447,175.00	2,722,363.00	131,480.00	-	8,294,931.00
Implementing Entity fees	97,807.60	156,674.99	208,009.88	231,400.73	11,175.80	-	705,069.00
<b>Total</b>	<b>1,248,485.60</b>	<b>1,999,909.99</b>	<b>2,655,184.88</b>	<b>2,953,763.73</b>	<b>142,655.80</b>	<b>-</b>	<b>9,000,000.00</b>

## PART IV: ENDORSEMENT BY GOVERNMENT AND CERTIFICATION BY THE IMPLEMENTING ENTITY

### A. Record of endorsement on behalf of the government<sup>45</sup>

<i>(Enter Name, Position, Ministry)</i>	Date: <i>(Month, day, year)</i>
---	---------------------------------

### B. Implementing Entity certification

<p>I certify that this proposal has been prepared in accordance with guidelines provided by the Adaptation Fund Board, and prevailing National Development and Adaptation Plans National Development and Adaptation Plans, the 2004 National Strategic Development Plan, 2013 National Policy on Disaster Risk Management Plan and Climate Change Adaptation, 2011 Kosrae State Climate Change Act, 2014 Kosrae Shoreline Management Plan and other relevant regulations, and subject to the approval by the Adaptation Fund, <u>commit to implementing the project/programme in compliance with the Environmental and Social Policy of the Adaptation Fund</u> and on the understanding that the Implementing Entity will be fully (legally and financially) responsible for the implementation of this project/programme.</p>	
<p><i>Kosi Latu</i>          Director General          SPREP</p>	
Date:	Tel. and email: +685 21929
Project Contact Person: Melanie King & Filomena Nelson	
Tel. And Email: +685 21929 ( <a href="mailto:melaniek@sprep.org">melaniek@sprep.org</a> and <a href="mailto:filomenan@sprep.org">filomenan@sprep.org</a> )	

<sup>6</sup> Each Party shall designate and communicate to the secretariat the authority that will endorse on behalf of the national government the projects and programmes proposed by the implementing entities.

## Annex A. FSM land ownership

### Box 2. Land in FSM

Land in FSM is managed under a complex mix of modern and traditional systems. Land is intricately connected to people's perception of inheritance and community. This needs to be tackled with a long-term perspective. The majority of transactions for commercial ventures transpire with survey; titling and documentation completed under modern land management institutions. Chuuk is an exception, due to long-standing unresolved disputes between individuals and clan groups. Disputes also arise periodically in the other states and can take an inordinately long period of time to resolve.

In Kosrae, Chuuk and Yap land rights may be legally sold to FSM citizens, but in Pohnpei land can only be sold to Pohnpeians. The FSM Constitution forbids the ownership of land by foreigners, but they are permitted to lease land. Multiple ownership of land still exists throughout the FSM, requiring the consensus of families, clans and traditional leaders for leases and development. This can present a constraint to development depending on the ability to achieve consensus. In all states the market for land is characterized by few transactions, limited market information, no formal mechanisms for public dissemination of market transaction data and price demands from (often multiple) landowners. As a result of these conditions, together with prevailing cultural factors influencing the perceived value of land, it can be said that transactions are only partly influenced by economic market forces and the potential productive value of land.

Distortions and rigidities in land market transactions will be difficult to reduce and change will undoubtedly be gradual. A focus on public education and information dissemination may result in accelerating this process. It is important that the current program of surveying and recording land titles of land available for development in the states is completed. Improvements in mortgage laws, leasehold mortgages and land management in general require actions within each state.

Chuuk State has taken action by passing leasehold mortgage law but has not yet promulgated regulations to implement the law. The extent to which land can be leveraged and mortgaged is important for increasing productive activity and incomes. Land assets that become locked outside the modern market economy cannot be leveraged or redeployed for production. The overall effect is that many landowners are asset rich and income poor.

Currently all land in Kosrae above the so-called *Japanese Line* (indicated in blue in map at right) is under government control. During the Japanese occupation of Kosrae, public lands were expanded to include the shoreline below the mean high-water mark, the mangroves and the upland forests above the Japanese Line, which includes approx. 67% of the total land area of Kosrae. As much as 50% of this area is too steep for any development and should be maintained as forest for watershed protection. A recent Constitutional amendment (Amen 19, 1995) was passed which allows reclamation of land above the Japanese Line by the original landowners. Land will be awarded by issuing a Certificate of Title to an individual or to the Tenancy-in-Common. A procedure for reclamation must be established by law before any advancement can be made and should be guided by this land use plan.



Sources: FSM 2023 Action Plan (pgs 47-48); Kosrae State Land Use Plan 2003

## **Annex B. Environmental and Social Management Plan**

September 2019

Federated States of Micronesia

# Enhancing Climate Change Resilience of Vulnerable Island Communities in FSM

Environmental and Social Management Plan

# ENHANCING THE CLIMATE CHANGE RESILIENCE OF VULNERABLE ISLAND COMMUNITIES IN FSM

## Environmental and Social Management Plan

### Quality Information

Document      Environmental and Social Management Plan Revision B  
Date            October 2019  
Prepared by    Kate Walker, SPREP

### Revision History

Revision	Revision Date	Details
A	May 2016	ESMP for Project Preparation
B	October 2019	Updated for Project Implementation

## Glossary

AF	Adaptation Fun
AP	Affected Persons
CBA	Cost Benefit Analysis
DECEM	Department of Environment, Climate Change and Emergency Management
DTI	Department of Transport & Infrastructure
EE	Executing Entity
EIA	Environmental Impact Assessment
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
ESCP	Erosion and Sediment Control Plan
ESMP	Environmental and Social Management Plan
ESS	Environmental and Social Safeguards
FSM	Federated States of Micronesia
GRM	Grievance Redress Mechanism
IE	Implementing Entity
IWRM	Integrated Water Resource Management
KIRMA	Kosrae Island Resource Management Authority
KSMP	Kosrae Shoreline Management Plan
NGO	Non-Governmental Organisation
NWSP	National Waste and Sanitation Policy
PCT	Project Coordination Team
SCT	Self-Composting Toilets
SECP	Stakeholder Engagement and Consultation Plan
SPREP	Secretariat of Pacific Regional Environmental Program
TOR	Terms of Reference
WASH	Water, Sanitation and Hygiene
WHSS	Water Harvesting Storage System

## Contents

1	Introduction .....	6
1.1	Integration of ESMP .....	7
1.2	Disclosure.....	8
2	Project Description.....	9
2.1	Project Overview .....	9
2.2	Project Sites .....	12
2.2.1	Pohnpei: Kapingamarangi and Nukuoro.....	13
2.2.2	Chuuk State: Satawan and Lukunor.....	14
2.2.3	Yap: Eauripik and Woleai .....	15
2.2.4	Kosrae State .....	17
2.3	Physical Interventions.....	18
2.3.1	Water Security Interventions (Component 2) .....	18
2.3.2	Kosrae Infrastructure Investments (Component 3).....	21
2.3.3	Kosrae Road Analysis of Alternatives.....	26
2.4	Land Requirements.....	27
3	Policy, Legal and Administration Framework .....	29
3.1	National and State Legislation .....	29
3.1.1	Environmental Legislation .....	29
3.1.2	Other Legislations and Codes .....	30
3.2	Adaptation Fund Safeguard Policies.....	31
3.2.1	Gender Action Plan .....	39
5	Stakeholder Engagement.....	40
5.1	Stakeholder Identification .....	40
5.2	Stakeholder Groups .....	40
5.3	Stakeholder Engagement and Consultation Plan (SECP) .....	41
5.3.1	Implementation Plan .....	42
5.3.2	Resources and Responsibilities.....	43
5.4	Consultations to Date .....	43
5.5	Public Disclosure .....	44
5.6	Grievance Redress Mechanism.....	44
6	Environmental and Social Impacts.....	47
6.1	Water Security Investments Under Component 2 .....	47
6.1.1	Social Impacts .....	47
6.2	Coastal Defence Upgrades in Kosrae .....	50
6.2.1	Environmental Impacts.....	50

6.2.2	Social Impacts .....	52
6.3	Inland Road Relocation in Kosrae: Design phase.....	53
6.3.1	Environmental Impacts.....	55
6.3.2	Social Impacts .....	59
7	Environmental and Social Management Plans .....	61
7.1	Introduction .....	61
7.2	Management Plan for Water Security Measures .....	62
7.2.1	Environmental and Social Management Plan.....	62
7.2.2	Monitoring Plan for Water Security Interventions .....	69
7.3	Management Plan for Kosrae Coastal Defence Upgrades.....	74
7.3.1	Environmental and Social Management Plan.....	74
7.3.2	Monitoring Plan for Kosrae Coastal Defence Upgrades .....	81
7.4	Management Plan for Kosrae Inland Road Realignment.....	88
7.4.1	Environmental and Social Management Plan.....	88
7.4.2	Monitoring Plan for Kosrae Inland Road Realignment .....	92
7.5	Erosion and Sedimentation Control Plan.....	95
7.6	Site Selection for Water Security Interventions .....	95
7.7	Technical Assistance and Policy Development .....	96
7.7.1	Policy, Regulations and Plan Development .....	96
7.7.2	Consultants .....	97
7.7.3	Capacity Building and Materials Development.....	97
7.7.4	Municipality Development Plans.....	97
8	ESMP Implementation .....	98
8.1	Integration of ESMP into Project Management.....	98
8.2	Roles and Responsibilities.....	98
8.2.1	Project Board .....	98
8.2.2	Implementing Entity .....	98
8.2.3	Project Management Unit under DECEM .....	98
8.2.4	Design Engineer .....	99
8.2.5	Contractors .....	99
8.2.6	Supervision Entity .....	100
8.2.7	Technical Advisors / Consultants .....	100
8.3	ESMP Budget.....	101
9	Capacity Development & Training .....	102
9.1	Capacity Development.....	102
9.2	Training.....	102

Annex 1: Kosrae Inland Road Detailed Alignment .....	103
Annex 2: Sediment and Erosion Control Plan .....	104
Annex 3: SPC Composting Toilets Guide.....	109

## 1 Introduction

The Adaptation Fund's 'Enhancing the Climate Change Resilience of Vulnerable Island Communities in the Federated States of Micronesia' project (the project) has been designed to provide climate resilient interventions focusing on water security and coastal management. The overall goal of the project is to build social, ecological and economic resilience of the target island communities of FSM and reduce their vulnerabilities to extreme drought, sea level rise and other climate risks through water resource management and development planning, and by promoting gender perspectives and ecologically sound climate resilient livelihoods.

The project will achieve this through four components:

**Component 1:** Strengthening policy and institutional capacity for integrated coastal and water management at national, state levels and outer islands.

**Component 2:** Demonstration of water security and sanitation measures in outer islands of Yap, Chuuk and Pohnpei.

**Component 3:** Demonstration of adaptation measures for coastal communities in Kosrae State.

**Component 4:** Knowledge Management for improved water and coastal protection.

This Environmental and Social Management Plan (ESMP) has been prepared to document the environmental and social risks and impacts presented by the project and sets out the associated mitigation and management measures that will be implemented as part of project delivery.

The process leading to the development of this ESMP reflects and is based on the initial assessment by SPREP that the project is a 'Category B' project with moderate and manageable impacts confirmed to a limited geographic area. The most significant risk arises around Component 3 of the project (the Kosrae adaptation measures), and for which a targeted Environmental Impact Statement (EIS) for the road design (and future construction) has been undertaken and specific management strategies and actions devised.

Initial project screening based on the EIS, field investigations, stakeholder meetings and desktops study of similar projects in the region as well as a review of potential options confirms an assessment of Category B for the project. It finds that, **as long as the allocated budget for Component 3 is sufficient to meet the full design technical specifications for the entire length of the Malem to Utwe road (new and existing sections plus access roads)** potential impacts are less than significant, site specific, mostly reversible and that a range of potential measures for mitigation can be readily designed in the majority of cases. This statement will be reviewed against the final detailed design when it is completed. In accordance with The Adaptation Funds (AF) Environmental and Social Safeguard (ESS) policy, an environmental assessment is required to adequately screen and assess potential environmental and social impacts, and to prepare an ESMP.

Additionally, in accordance with AF ESS safeguard policy regarding involuntary resettlement, a screening of the land required, the land ownership and lease arrangements is required to confirm that no involuntary land acquisition or resettlement will be required.

Therefore, this ESMP has been produced to ensure the integration of environmental and social stewardship into the project as required by FSM's relevant laws and regulations and the Environmental and Social Safeguards Policies of the Adaptation Fund.

The ESMP provides the set of mitigations, monitoring, and institutional measures to be taken during the implementation and operation of the Project to eliminate adverse environmental and social impacts, offset them or reduce them to acceptable levels. The ESMP also includes the actions needed to implement these measures.

At this stage of project preparation, there are still some unknowns such as the specific locations of water security interventions under Component 2 therefore this ESMP provides guidance for screening of potential locations to assist with the final selection process, and covers all foreseeable risks and impacts and provides the relevant suite of mitigation measures.

### 1.1 Integration of ESMP

It is the responsibility of SPREP as the Implementing Entity (IE) and the Executing Entity (EE) under the Department of Environment, Climate Change and Emergency Management (DECCEM), to ensure that the ESMP is fully integrated into the Project. It is the IE's responsibility that proper processes and monitoring is in place to ensure the project is delivered with no significant negative environmental or social impact.

SPREP and DECCEM (as the respective IE and EE) will:

- Ensure that all government employees and contractors are sensitized on aspects of the plan and received appropriate training to fulfil their individual environmental and social responsibilities.
- Ensure that the necessary resources and skills are retained to successfully carry out all mitigation measures.
- Formally monitor and report on the environmental and social performances of all activities.
- Require that contract services manage their environmental and social performance in line with this ESMP.

DECCEM will also coordinate the State Project Coordination Teams (PCT) to:

- Continually monitor and report as needed issues related to social and environmental risk.
- Raise awareness amongst target communities on the Environmental and Social Policy of the AF and this ESMP

The ESMP shall form part of any bid documentation or TOR, and it shall be the IE's responsibility to ensure that ALL procurement documents and contractual specifications is subject to review against this ESMP to ensure that all appropriate safeguard measures are captured at the bid stage and in all contracts.

It is further the responsibility of the IE's to ensure that this ESMP is considered in review of any Terms of Reference (TOR) for Technical Assistance developed for the Project. The safeguard requirements for any design or supervision of the Project will be fully integrated into TOR to ensure that all safeguard responsibilities allocated within the ESMP are realized at the tender stage.

In this way, the ESMP will be fully integrated within the Project so that the required measures will be fully appreciated by all responsible parties and successful implementation will be achieved.

## 1.2 Disclosure

As part of the requirements of FSM national and state laws and AF ESS policy, the ESMP is to be publicly disclosed by the DECEM as the EE responsible for project implementation. DECEM will ensure the ESMP is disclosed in hard copy and online, in a manner that can be easily downloaded with existing network bandwidth and the accessibility that people currently have to the internet. A public flyer and/or radio advert will alert the public to the disclosure of the instruments. Likewise, DECEM will ensure that several copies of all prepared safeguard instruments are available locally at the relevant State Government offices and easily accessible to affected groups and local Non-Governmental Organisations (NGOs).

The ESMP will be reviewed, updated and approved if necessary. For each approved updated version of this ESMP, the DECEM as the EE will be responsible for disclosure through the above channels.

## 2 Project Description

This section is informed by the FSM Adaptation Fund Project Proposal Document, the Kosrae Road Relocation Environmental Impact Statement and other supporting documents with additional information obtained through consultations with the IE and EE project teams and a site visit to Kosrae. The information in this section has been used to inform the ESS assessment and management plan

### 2.1 Project Overview

The project seeks to enhance the community resilience through working with communities focusing on improving water security measures in outer islands of Yap, Chuuk and Pohnpei, and increasing the resilience of coastal communities to adapt to coastal hazards and risks induced by climate change. The project is expected to deliver a set of targeted and interlinked economic, social and environmental benefits, as well as serve as a model for future replication throughout the four states of the country in other sectors (food security, marine resource management). The project will promote a set of innovations, together with partner institutions/organisations that will help create better living conditions for the outer islands and coastal communities of FSM.

The overall goal of the project is to build social, ecological and economic resilience of the target island communities of FSM and reduce their vulnerabilities to extreme drought, sea level rise and other climate risks through water resource management, coastal resources and developments planning, and by promoting gender perspectives and ecologically sound climate resilient livelihoods.

The overall objective of the project is to reduce the vulnerability of the selected communities to risks of water shortage and increase adaptive capacity of communities living the identified villages to drought and flood related climate and disaster risks.

The overall objective is broken down into the following project objectives:

**Project Objective 1:** Prepare the necessary institutional and regulatory frameworks, policies, guidance and tools to help deliver a climate resilient FSM.

**Project Objective 2:** Strengthen water and livelihood security measures to help 6 outer atoll islands adapt to impacts of climate change related to water, health and sanitation.

**Project Objective 3:** Provide communities with climate resilient infrastructure to help relocate from high risk coastal inundation sites.

**Project Objective 4:** Capture and share the local knowledge produced on climate change adaptation and accelerate the understanding about the kinds of interventions that work in island environments in FSM.

These objectives will be achieved through the project strategy to provide all four State Governments in FSM with development planning tools and institutional frameworks to help coastal communities prepare and adapt for higher sea levels and adverse and frequent changes in extreme weather and climate events. The project strategy is also to provide communities with the resources and technical support needed to adopt and manage concrete climate change initiatives and actions.

The project sets out to achieve this through the following project activities, grouped by component and expected outcomes.

Table 1: All proposed project components, outcomes, outputs and activities.

Project Components	Expected Outcomes	Expected Outputs	Project Activities
1. Strengthening policy and institutional capacity for integrated coastal and water management at national, state levels and outer islands.	Strengthened policy and institutional capacity of government to integrate climate risk and resilience into its water and coastal management legislative, regulatory and policy frameworks	1.1 Legislation and policy paper to guide regulation of climate resilient coastal and marine management at national level.	1.1.1 Review of National-level legislation and policies for: (i) infrastructure to identify climate change requirements and (ii) regulatory and policy framework for climate change .
			1.1.2 Develop guidance based on recommendations from the review of coastal and marine management legislation and policy) and monitor progress of recommendation uptake through relevant Departments.
		1.2 State regulations for coastal and marine development projects amended to consider climate change risks and resilience measures.	1.2.1 Review of State-level legislation and policies for infrastructure to identify climate change requirements.
			1.2.2 Develop guidance based on recommendations from the review of coastal and marine management legislation and policy) and monitor progress of recommendation uptake through relevant Departments.
		1.3 State Water Outlook and Water Sector Investment Plan developed and implemented.	1.3.1 Support the implementation of State-level Water Outlook and Investment Plans.
2. Demonstration of water security measures in outer islands of Yap, Chuuk and Pohnpei	Water conservation and management technology & practices adopted, responding to drought, sea level rise and early recovery from cyclones.	2.1 Outer island communities oriented to CC, SLR, and adaptive capacity measures involving water, health, sanitation, and environment.	2.1.1 Arrangements for demonstrations of water and sanitation technologies.
			2.1.2 Carry out ground-truthing assessments.
		2.2 Water Harvesting and Storage System (WHSS) repaired and installed in 6 atoll islands.	2.2.1 Repairing household rainwater harvesting and storage system.
			2.2.2 Constructing community rainwater harvesting and storage systems.

Project Components	Expected Outcomes	Expected Outputs	Project Activities
			2.2.3 Implementation of a monitoring and maintenance programme.
	Appropriate sanitation measures for the outer islands of Yap, Chuuk and Pohnpei are determined for future investment.	2.3 Assessment of viable sanitation measures for outer islands in Yap, Chuuk and Pohnpei.	2.3.1 Sanitation measures assessed and piloted in outer islands in Yap, Chuuk and Pohnpei.
3. Demonstration of adaptation measures for coastal communities in Kosrae State	Increased resilience of coastal communities and environment to adapt to coastal hazards and risks induced by climate change.	3.1 3. Malem - Utwe inland road and access routes designed for future construction.	3.1.1 Survey and design road and related infrastructure to ensure climate change resilience.
		3.2 Transitional coastal protection at Mosral and Paal upgraded for immediate coastal protection.	3.2.1 Upgrade coastal protection works.
4. Knowledge management for improved water and coastal protection	Capacity and knowledge enhanced and developed to improve management of water and coastal sectors to adapt to climate change.	4.1 Resource materials developed, tailored to local context, translated, published, and shared amongst various stakeholders.	4.1.1 Undertake knowledge management, communication and engagement activities.
			4.1.2 Capture and document data and information generated by the project.

2.2 Project Sites

The project activities in Table 1 will be implemented across FSM. Figure 1 and Figure 2 below gives geographical context to the States of FSM which are discussed throughout the ESMP.

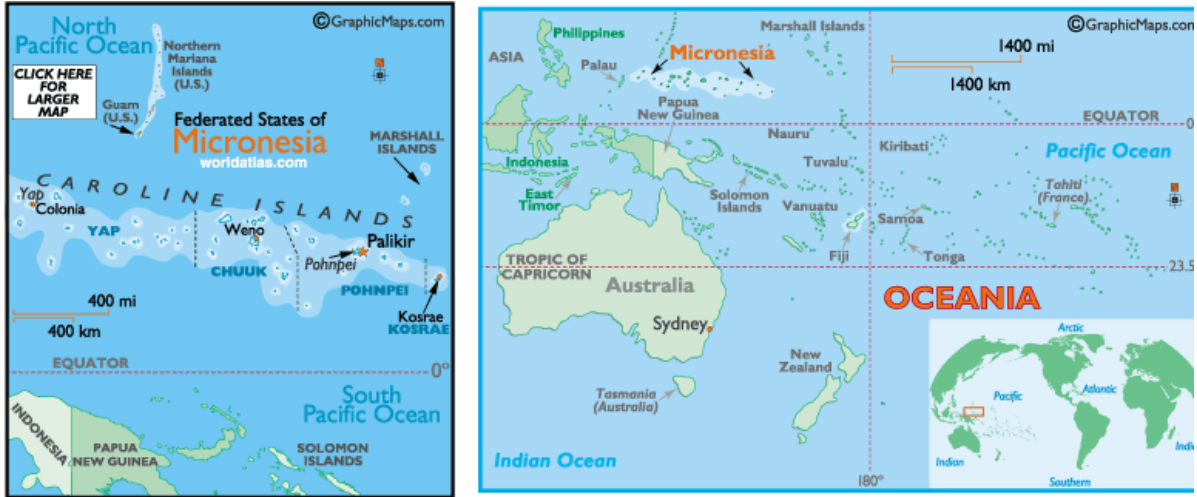


Figure 1: Federated State of Micronesia geographic context

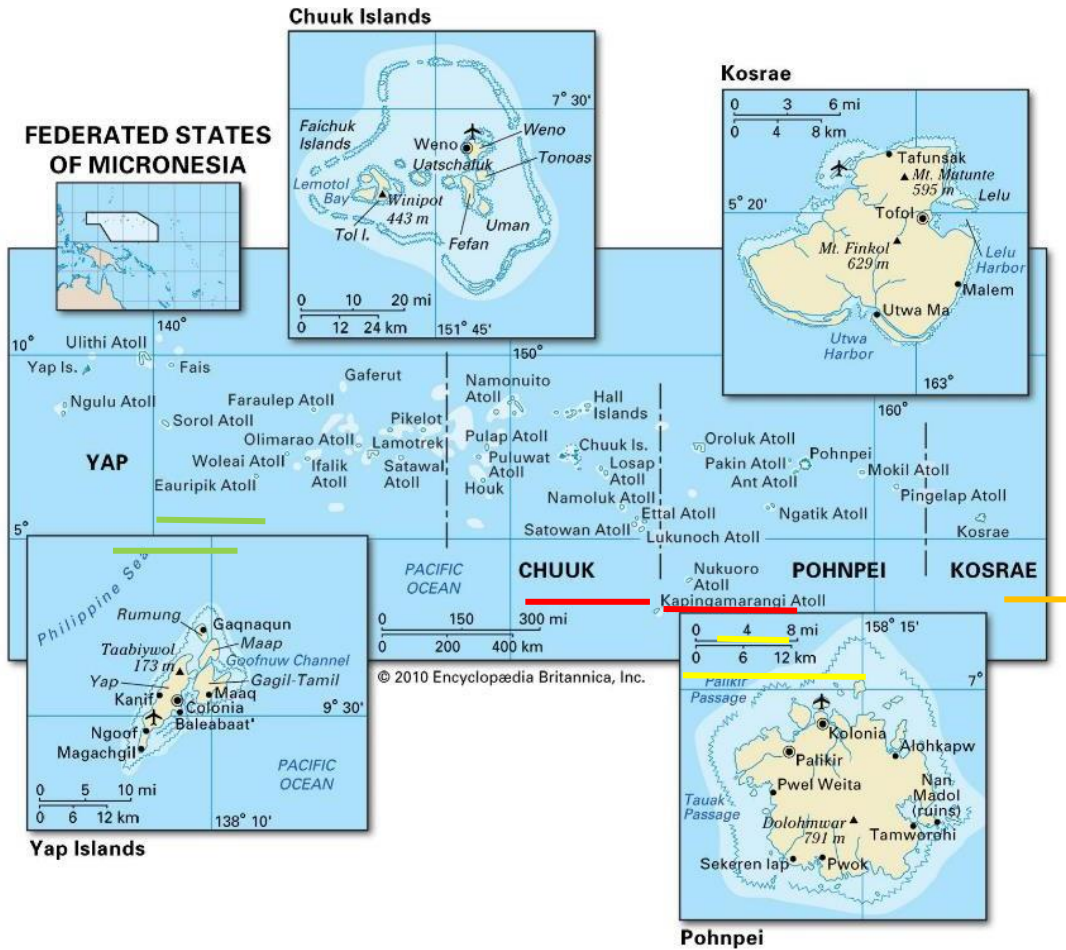


Figure 2: States of FSM

The Government of FSM has identified two outer islands each in Pohnpei, Chuuk and Yap states as priorities for the water security component of this project. These are Kapingamarangi and Nukuoro in Pohnpei; Satawan and Lukunor in Chuuk and Eauripik and Woleai in Yap. The majority are among the atolls most remote from their respective mainland. Figure 1 highlights the atoll location of these islands while the subsections below show the location of the islands nominated under component 2.

### 2.2.1 Pohnpei: Kapingamarangi and Nukuoro

Kapingamarangi and Nukuoro are the two Pohnpei atolls that will be addressed by the project, with a population of 350 and 210 respectively. Both atoll's ground water resources are already susceptible to sea water intrusion, underground water pollution and surface water pollution from agricultural practices.

Kapingamarangi atoll (Figure 3) is by far the most southerly atoll or island of the country. The total area of the atoll, including the lagoon, is 74km<sup>2</sup>. Out of this, 1.1km<sup>2</sup> is land area, spread over 33 wooded islets on the eastern side of the atoll, three of which are inhabited. The western reef rim of Kapingamarangi atoll is almost submerged at high water. Much of the islets on this western reef that is used for growing fruit and vegetables are now under threat. As a result, the islanders are now looking to move the growing of such fruit and vegetables to the same islets where they are raising livestock as well as on the main island of Touhou where people reside. This is already putting pressure on the water resources on Touhou, where the highest point is only 90 cm.

Nukuoro is another outlying atoll (Figure 4) in southern FSM. The total area, including the lagoon, is 40km<sup>2</sup>, with a land area of 1.7km<sup>2</sup> which is divided among more than 40 islets that lie on the northern, eastern and southern sides of the lagoon. By far the largest islet is Nukuoro islet, which is the center of population and the capital of the municipality. On Nukuoro, the staple food crop is taro. Taro is highly susceptible to salt water intrusion. During drought, the communities use raised swamp taro patches as water reservoirs to catch water for cooking and washing. Buckets and recycled oil-drums are a common method of storing water at the household levels. The population of Nukuoro are highly vulnerable to water and vector-borne diseases as a result of poor quality of water.



Figure 3: Kapingamarangi atoll with largest settlement shown (yellow star)



Figure 4: Nukuoro atoll with largest settlement shown (yellow star)

### 2.2.2 Chuuk State: Satawan and Lukunor

Satawan (Figure 5) with a population of 692 and Lukunor (Figure 6) with a population of 848 are the two Chuuk atoll communities that will be addressed by the project.

Satawan atoll is located about 250km southeast of Chuuk lagoon proper. It has a land area of about 5km<sup>2</sup>. There is a primary and secondary school that serve the islands but no regular electricity of running water. Lukunor is a small atoll located about 264km to the southeast of Chuuk.

On both atolls, the islands are only three to five meters above sea level and are therefore prone to impacts of sea level rise. The islands water wells are brackish and provide only limited water. Some wells are only used to draw water for washing and cooking during drought, as it is unsafe for general

consumption. Most water wells are not covered, and therefore contamination from sea water, e- coli, and humus is common. Most of the households on both islands have at least one water tank, which has found to be unsustainable during drought. The rainwater harvesting systems are in poor condition as a result of sustaining damage from typhoons, lack of spare parts and poor maintenance, leaving these communities highly vulnerable to drought. During periods of drought, people and animals often resort to coconuts and root trees for water and hydration.

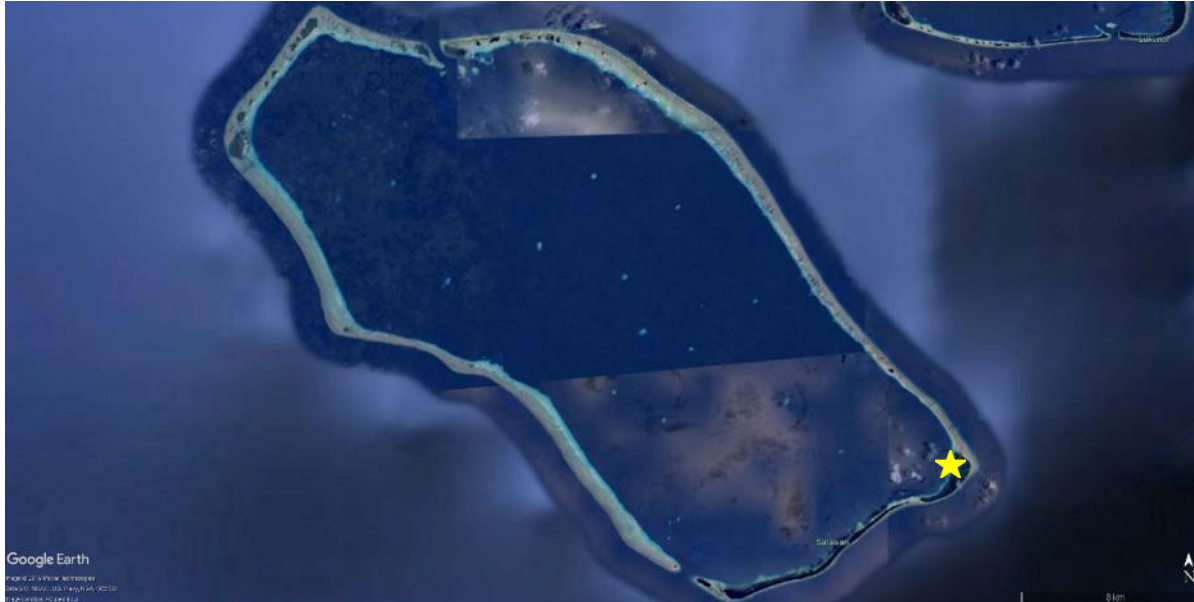


Figure 5: Satawan atoll with largest settlement shown (yellow star)



Figure 6: Lukunor atoll with largest settlement shown (yellow star)

### 2.2.3 Yap: Eauripik and Woleai

Eauripik (Figure 7) and Woleai (Figure 8) atoll's are two of 14 outlying atoll's administered by Yap state. Eauripik atoll has a population of 113 and consists of three islands with a total land area of 0.24km<sup>2</sup>. All the islets are covered with coconut palms. Eauripik is one of the smallest and most

remote populated islands in the Pacific. Its population live at a high density and combine subsistence production of tree and root crops with various forms of fishing from reefs, lagoon and ocean.

Woleai atoll is approximately 108km northeast of Eauripik. It is a coral atoll of twenty-two islands, the largest of which is called Woleai. The northern and eastern rims of the atoll have several relatively large islets and the atoll itself has a total land area of 4.5km<sup>2</sup>.

The significance of climate change to the State of Yap is set out in the Joint State Action Plan. As the westernmost state of FSM, Yap is exposed to a range of threats that create significant vulnerabilities for the state. Yap is in 'Typhoon Alley', is likely to be disturbed by earthquakes and tsunamis, and suffers droughts due to the impact of El Niño Southern Oscillation (ENSO). ENSO is also the cause of both excessive and below average rainfall. Yap is drier than the other states of FSM and is highly susceptible to drought. The lack of adequate water storage capacity on the outlying islands increases the inhabitant's vulnerability to the impacts of drought. Yap is very vulnerable to flooding during typhoons and storm surges. The state does not regularly receive large amounts of rain and thus the damage from extreme surge and rainfall events is usually much more intense.

The distances between islands makes it difficult to get much-needed food, water and medical supplies to residents after a disaster, meaning Yap is more vulnerable to health and other secondary impacts of disasters than the other FSM states. Through July 2015 and January 2016 island leader and community consultations, facilitated by the government of Yap through the Department of Resources & Development and SPREP, the atoll islands of Eauripik and Woleai are nominated for water security measures. The most recent impacts caused by Typhoon Maysak and the recent 2015- 2016 El Nino phenomena was felt strongly at these islands requiring water resources to be secured.



Figure 7: Eauripik atoll with largest settlement shown (yellowstar)

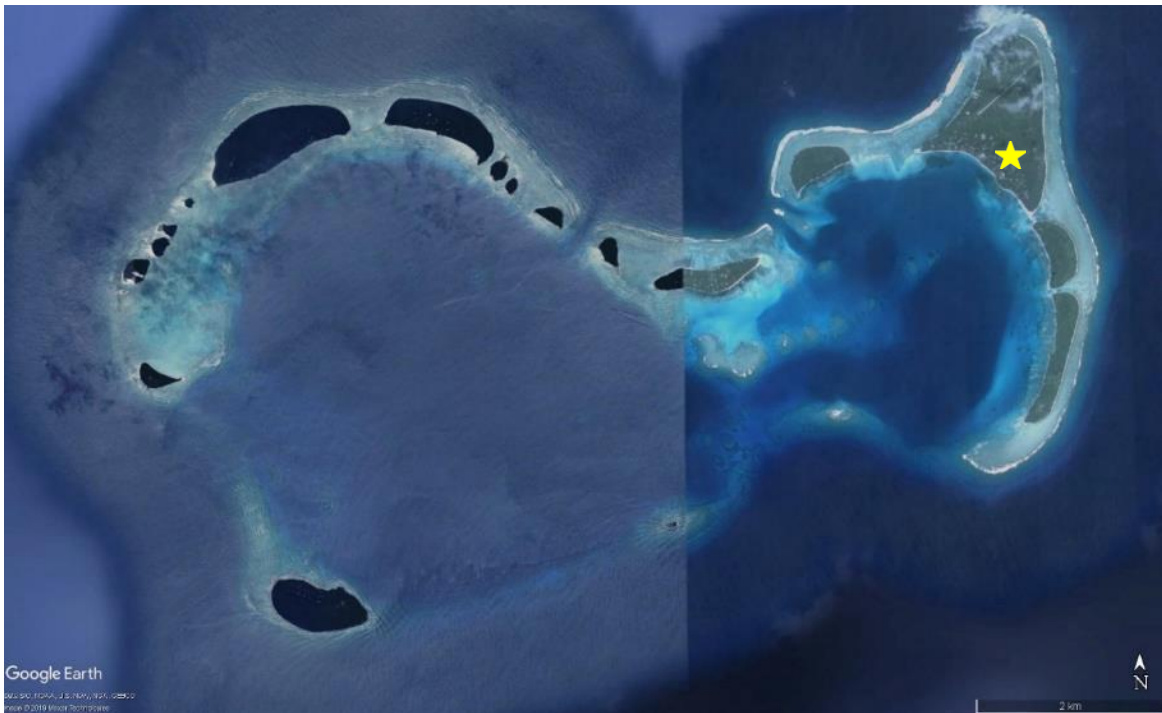


Figure 8: Woleai atoll with largest settlement shown (yellowstar)

The government has also focused on building the capacity of the communities of Malem and Utwe in Kosrae to respond to climate as well as improving the resilience of its infrastructure and natural environment to climate change under component 3.

#### 2.2.4 Kosrae State

Kosrae (Figure 9) is the easternmost and second largest island of the FSM, located approximately 372 miles southeast of Pohnpei. Kosrae has a land area of 112km<sup>2</sup> and a population of just over 6,000 people.

Kosrae is the only state without an outer island. It is divided into four municipalities, with respective populations as follows: Lelu (2,160), Malem (1,300), Tafunsak (2,173) and Utwe (983). Geographically, the state is characterized by steep mountains and deep valleys covered with thick, fertile tropical vegetation and forests, and dense mangrove forests in coastal areas. The island's main natural resources are its abundant forests with significant agricultural potential, marine products and deep-seabed minerals<sup>1</sup>.

Kosrae is a high volcanic island surrounded by a fringing reef, mangroves and coastal strand forests that have been historically used for lumber and fuel by residents. There is a shallow fringing reef spotted with boulders of coral heads that have been dislodged from the fore – reef during occasional cyclone events. There are no outer islands. The island has steep, heavily vegetated watersheds, which in the mid to upper parts of the catchment are in relatively natural state. Where clearing or deforestation on sloping areas does occur, however, intense rainfall quickly denudes exposed soil. Invasive vegetation is a significant problem and has taken a foothold in many of the lower parts of many of the catchments.



Figure 9: Kosrae State with Malem (yellow) and Utwe (blue) shown

## 2.3 Physical Interventions

This subsection looks in more details at the physical interventions planned under components 2 and 3 drawing from the Project Proposal Document and Kosrae site visits. The Project Proposal Document (Part II, Section A) goes into more detail on the following sections and should be referred to in conjunction with this ESMP.

### 2.3.1 Water Security Interventions (Component 2)

#### 2.3.1.1 Water Harvesting and Storage Systems (WHSS)

Ground truthing assessments (project activity 2.1.2) will be carried out to reaffirm data and recommendations gathered from the consultations carried out during the planning stages of the project (July, November 2015; January, February 2016), and from rapid assessments carried out by

<sup>1</sup> Federated States of Micronesia Infrastructure Development Plan FY2016-FY2025. Volume 6 Yap State Infrastructure Development Plan

the Department of Resources and Development, and International Organisation for Migration (IOM) in March 2016. This will include carrying out technical surveys on water, water use in the community villages on the islands, sanitation and health incidences related to water. These surveys will also collect information on social aspects such as traditional knowledge, cultural and political governance and how these may influence the implementation and management of the project.

Following on from this, the water harvesting and storage systems will address the climate stresses, namely the prolonged periods of drought such as those experienced in the 1997-1999, 2003-2005, 2015-2016 El Nino events, and the extreme weather events leading to high intensity rainfall, and lengthening of the dry season months.

At present, various types of water harvesting systems exist in poor conditions on the islands and people resort to coconut juices to meet their water harvesting demands<sup>2</sup>. The rainwater harvesting and ground water wells that exist are largely privately owned. The current rainwater harvesting systems and storage elements including roofing, guttering, down piping, water tanks and concrete tanks. All systems are in poor, basic or unusable conditions as a result of damage from cyclones, extreme high tide events damaging infrastructure coupled with no maintenance due to lack of equipment and spare parts<sup>3</sup>. In Yap, for example, 40% of water tanks on all nine outer islands including Woleai and Eauripik do not have proper rain harvesting systems (tin roofs for collecting rainwater and gutters including down spout, fasteners and clips). Nearly 90% of water wells had very low water levels; all are brackish and nearly all were uncovered. These neglected or nonfunctional wells often become a breeding ground for mosquitos bringing a risk to public health by increasing vulnerability to communicable diseases.

The project (activity 2.2.1) will rehabilitate, and repair existing materials of the household and community systems selected from the ground truthing assessments to close leaks and improve efficiency of existing rainwater harvesting systems. It will extend the gutters to the full dimensions of the catchment to capture more water; increase the catchment area to improve long-term water security and storage tank size overflow is frequent.

In addition to the repair activities, the project will construct (activity 2.2.2) community tanks to assist the larger community in times of drought to relieve pressure on individual household water tanks and to meet basic water requirements for the medium-term survival needs. These include meeting not only the short-term survival requirements of drinking and cooking, but personal washing, washing clothes, cleaning home, growing food and sanitation and waste disposal. The construction of community tanks will be undertaken under the following minimum requirements:

---

<sup>2</sup> Rapid Assessment Report, March 2016 FSM

<sup>3</sup> FSM Adaption Fund Project Proposal Document

	COMMUNITY LEVEL
<b>Rainwater catchment systems</b>	
Key activities	Install community tanks
Minimum requirements	<ul style="list-style-type: none"> <li>• _Minimum 2 x 5,000 L / 2,000 Gallon HDPE tanks per atoll island &gt; 100 population</li> <li>• _&lt;100 population requires re-assessment</li> <li>• _&gt; 400 population = 4 tanks</li> <li>• _HDPE tanks preferred over concrete tanks</li> <li>• _Extend gutters to full dimension                             <ul style="list-style-type: none"> <li>• _Catchment area sized appropriately to tank volume using reliability curves.</li> <li>• _Encourage standalone catchment areas to shelter tanks and fence for protection</li> <li>• _Access and maintenance rules established and to include cleaning each tank on a rotation basis, cleaning to be 3 times per year</li> <li>• _Rules for access to include access by neighboring villages in times of drought</li> </ul> </li> <li>• _Maintenance schedules established</li> </ul>
	<b>Design and Upgrading of Wells</b>
Minimum requirements	<ul style="list-style-type: none"> <li>• _Municipal council review, assessment and executive orders on environmental advice on burials to encourage use of existing cemeteries and reconsider burials in private residences and plots</li> <li>• _Exceptions to consider sites down hydrological gradient from wells.</li> </ul>

The table above is sourced from the original project documentation. This ESMP provides additional safeguard measures (Section 7.2.1) for the location, land management around and use of wells. DECEM PMU will ensure these additional requirements are incorporated into the bid documentation for design and/or construction of these interventions.

### 2.3.1.2 Self-Composting Toilets (SCT)

SCTs are proposed for each of the six islands identified under the water security component, however the exact numbers and locations of SCTs have not been finalised. It is known that wherever they are installed, there will be at least one unit each per gender.

During project preparation, the community leaders of the outer islands chose to invest in technologies to conserve water as much as possible to respond to the drought periods driven by El

Nino. Self-composting toilet technologies has been chosen as one of the investments along with RWHSS. The technologies have been proven in communities in Tuvalu and Nauru through the Integrated Water Resource Management (IWRM) project in partnership with PACC, as one of the best solutions to conserve water as it uses no water at all, and the technology avoids sewage contamination of the groundwater. It therefore promotes replenishment of groundwater useful for bathing, washing, planting, and depending on the environment for cooking. The current practice of using the lagoon side as toilets will be reduced significantly as the schools and community halls or public places – will be targeted by the project to install these units. This practice contributes to reducing marine eutrophication on the lagoon side.

This project will therefore aim to develop a plan to promote self-awareness on the benefits of self composting toilets to adapt to and respond to climate change in the immediate to long-term. It will demonstrate the units at schools and/or community halls, churches, etc. It will train teachers, boys, girls and community members on the use of the units and its functions. It will train the beneficiaries on WASH and water conservation practices in school and communities as well as monitoring and care after.

The cultural diversity amongst the six outer islands of the three states suggests there may be diverse preferences for the types of sanitation technologies used on the islands. The absence of pit toilets on some of the islands on the atoll in Woleai and Eauripik in Yap and Satawan in Chuuk are a blessing for the local groundwater and its quality. In these locations, the benefits of the SCT should be clearly communicated to ensure that pit latrines continue to be avoided. A concern would be that continued avoidance of the pit latrine would lead to communities using open defecation on land or beaches or defecation in the ocean. There is possible evidence of eutrophication during low tide on the lagoon side. The onset of climate stresses that include increase in sea surface temperatures will exacerbate this problem contributing to food security issues as well as water, sanitation and health issues.

The project proposal document notes that the ground-truthing assessments in activity 2.1.2 may yield some results on disagreement to proceeding with output 2.3 and its activities. The result may come from any of the six island communities as a result of cultural and social barriers. In the event that this output is not entertained, the project team will refer the community / island to other community potential alternative adaptation priorities they identified during project planning consultations.

### 2.3.2 Kosrae Infrastructure Investments (Component 3)

#### 2.3.2.1 Paal and Mosral Coastal Defence Upgrade

The Kosrae Shoreline Management Plan (KSMP) identifies that over the short-term the effect of sea-level rise on the ability of coastal defences to provide a “satisfactory” level of protection is likely to be manageable through, for example upgrading the level of protection of these existing defences. Upgrading of the critically threatened sections of road at Paal and Mosral (Figure 10) is a suitable transitional defence while the long-term solution of relocating the road inland is implemented. This is undertaken only with a view to provide short to medium term protection.

Emergency works (Figure 11) were subsequently conducted in response to high tides and waves undermining the road at Paal and Mosral in early 2014. This was an emergency measure involving dumped and roughly placed recycled concrete slabs from the upgrading of the runway hard standing, and at Mosral of large concrete filled bags to create a wall. Whilst the emergency works

has stabilized the immediate undermining of the road, the ad hoc nature of the construction, does not provide an adequate level of protection to the road with over wash being experienced during storm or high wave conditions.



Figure 10: Paal (blue circle) and Mosral (yellow circle) sites for coastal defences upgrade works



Figure 11: Existing emergency coastal defence works at Mosral (left) and Paal (right)

At Paal, the 160 m length of the emergency defences will be reconstructed (Figure 12). This will involve:

1. Remove the existing dumped concrete rubble to enable the underlying sand and coral rubble material to be regraded approximately 1:2 slope.

2. Geotextile filter layer will be laid between the underlying material and the armour layer to prevent wash out and winnowing of fine material between the armour layer.
3. The concrete slabs are of a sufficient size to withstand design wave conditions over the reef flat at Paal. These will be reused as the armour layer for the base and lower part of the face of the revetment and will be laid at a slope of 1:2 in a stepped manner.
4. There are insufficient concrete slabs to complete the full stepped revetment. Basalt rock armour, sourced from an existing permitted quarry inland between Paal and Mosral, will be used to complete the crest of the revetment. Armour rock will be a minimum of 0.66 m in diameter and will be laid at a 1:2 slope with the crest of the revetment at least 3 rocks wide. The crest of the defence will be above the elevation of the road.
5. At the southern end of the reconstructed defence the revetment the road curves inward with a wider coastal buffer protecting it, with the shoreline position at this location, "held" by a small strand of reef flat mangroves. The revetment will extend behind the existing shoreline at this point to ensure that outflanking and down drift erosion does not occur.

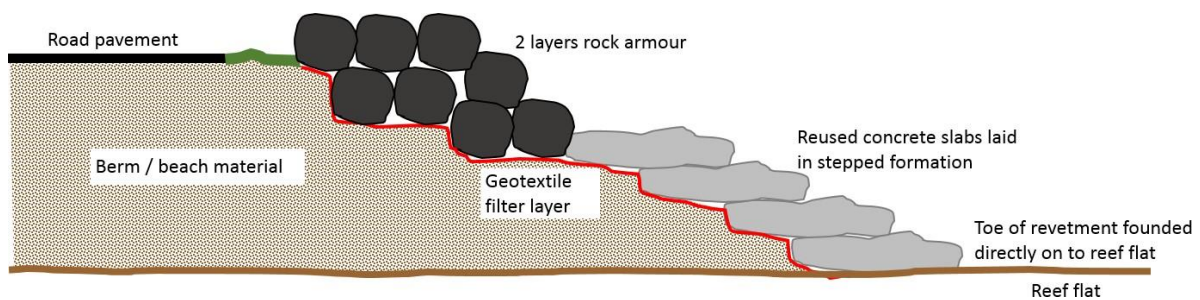


Figure 12: Cross-section of the proposed reconstructed revetment at Paal. Source: Project Proposal Document

At Mosral, the 110 m length of the emergency defences will be reconstructed (Figure 13). This will involve:

1. Remove the existing dumped large concrete blocks and rubble to enable the underlying sand and coral rubble material to be regraded to approximately a 1:2 slope.
2. The small fillet of sand beach in front of the existing defence will be stockpiled on the adjacent reef flat and re-instated in front of the reconstructed defence on completion.
3. Geotextile filter layer will be laid between the underlying graded slope and the armour layer to prevent wash out and winnowing of fine material between the armour layer.
4. The concrete blocks are of a sufficient size to withstand design wave conditions over the reef flat at Mosral. These will be reused as the armour layer for the base of the revetment and will be laid to form the base of the revetment.
5. There are insufficient concrete blocks to complete the full revetment. Basalt rock armour, sourced from an existing permitted quarry inland between Paal and Mosral, will be used to complete the crest of the revetment. Armour rock will be a minimum of 0.66 m in diameter and will be laid at a 1:2 slope with the crest of the revetment at least 3 rocks wide. The crest of the defence will be above the elevation of the road.

- At the southern end of the reconstructed defence the revetment there is potential for down drift erosion to occur and outflanking of the defence. To prevent this, the slope of the revetment will be constructed at a shallower slope and the armour rock used to construct a wider and flatter toe on the reef flat. This will ease the transition from defence to beach and prevent any exacerbated erosion on the coastline immediately to the south.

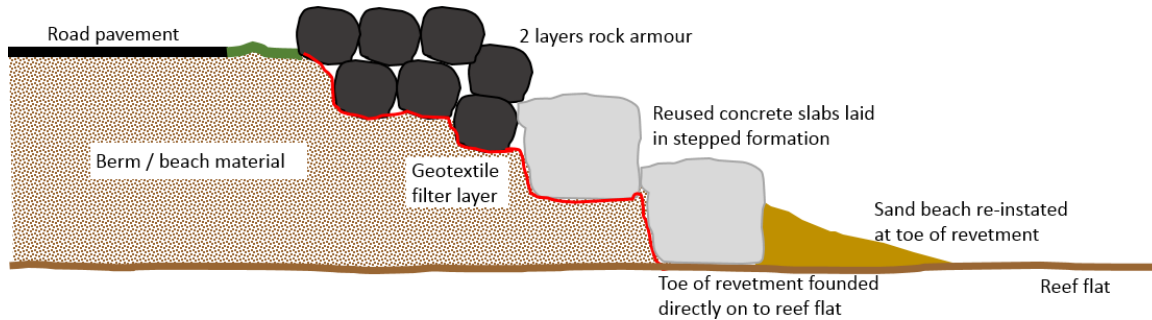


Figure 13: Cross-section of the proposed reconstructed revetment at Mosral. Source: Project Proposal Document

TC&I will supervise and provide oversight of the design and construction of the coastal protection works at Paal and Mosral. It will provide oversight of the work ensuring quality control and the activity will be in compliance with the protective engineering structure design standards of the Kosrae circumferential road extension project (ADB, 2005). The proposed works have been permitted through KIRMA's Development Review and permitting process and KIRMA will provide oversight to ensure all design and environmental requirements are adhered to during the construction.

#### 2.3.2.2 Kosrae Inland Road (Malem to Utwe)

The KSMP developed a prioritised list of inland road and essential infrastructure development to be implemented over the next one to two generations as an essential component for developing resilience to coastal-related hazards and sustained adaptation to climate change. Developing and upgrading the inland road between Malem and Utwe was considered the highest priority due to the current threats posted to vulnerable populations and infrastructure due to wave overwashing and potential breaching of the narrow coastal berms upon which present infrastructure and much of the population of Utwe and Malem municipalities are located.

This activity will design the inland road up to an sealed (asphalted) standard. Figure 14 shows the detailed road alignment along with respective section types and lengths between Malem and Utwe (See Annex 1 for larger version). This final road alignment selection process is detailed in the Environmental Impact Statement.

This is the first stage of the inland road construction. Construction of the road in the future should be subject to a new environmental assessment and permitting.

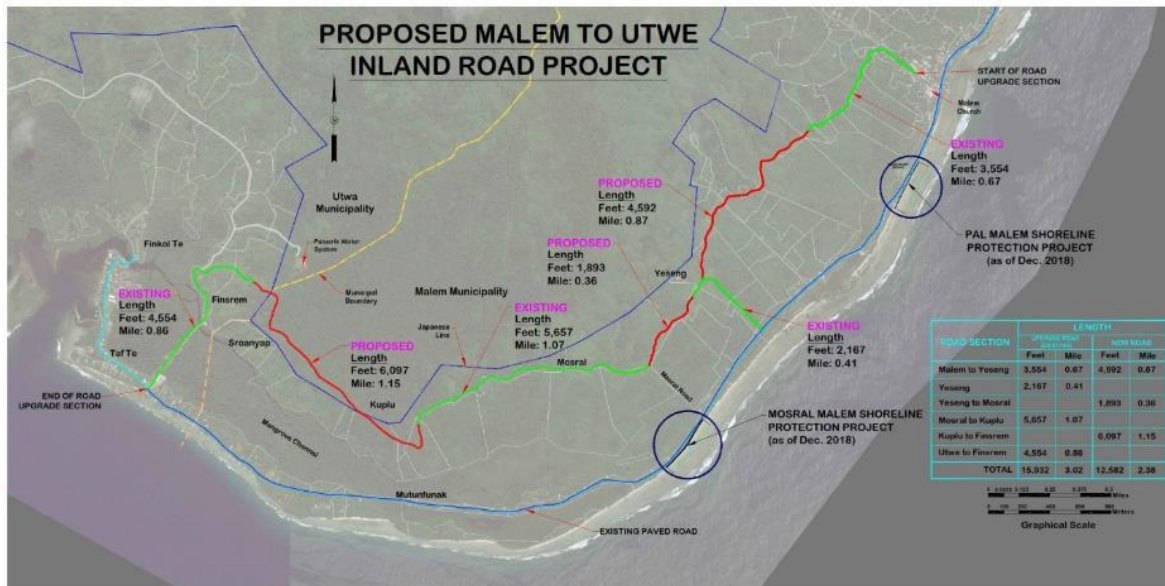


Figure 14: Detailed road alignment for Kosrae Inland Road

To date, the full road alignment has been subject to a topographic and geological survey by the design engineers, there is also a draft detailed design which has been developed by the engineer. This has been costed at USD\$3.9m and is for the three sections of new alignment only (the red sections in the figure above). The engineer is currently upgrading their design to take into account the entire proposed inland road and additional changes to the design, and this will have implications on the cost.

The inland road design is based on the design standard developed for Kosrae circumferential road extension project (Barret Consulting Group, Inc, 1987) and is consistent in design to other parts of Kosrae’s primary road network. It assumes:

A 60ft standard road easement width (Figure 15):

- The road design and construction is to be extended from the original 3.6 miles of priority sections of upgraded road (i.e. Malem to Pilyuul (Section 3), Malem to Utwe (Section 2) and Utwe (Section 1)) to 5.53 miles which will include the road in its entirety (refer Figure 1) and an additional access road.
- The road surface is to be upgraded from the gravel sub-base to asphalt to accommodate the adaptation requirements (i.e. 50 years life span) and erosion and runoff concerns.
- The road lane width is to be reduced from 12 feet to 10 feet per lane, ensuring consistency with FSM standards for road width.
- A 3% cross-section drainage gradient for the sub-base surface (although consultations between EE and the design engineer suggested that a steeper gradient may be required in hill terrain to minimise road surface erosion);
- Existing sections of inland farm roads will be widened to obtain a roadway width of 30ft., and include construction of roadway drainage structures (bridges and culverts) and resurfacing to sub-base course level;
- The design is to include all earthworks, retaining walls and erosion considerations to meet the best standards and to reduce the environmental impacts due to the steep alignment of the road.

- The design is to incorporate areas of historical and cultural importance to ensure these are avoided.
- The rights-of-ways are to be provided to EMPSCO for incorporation into the road design.
- The mitigation actions detailed in the Environmental and Social Safeguards Plan are to be incorporated into both the design and construction phases as appropriate for each phase.
- An integrated infrastructure approach is adopted which includes relocation of power distribution, and any water or telecom service infrastructure. The design phase should include all utilities and scoping / design work on this will need to be tendered.

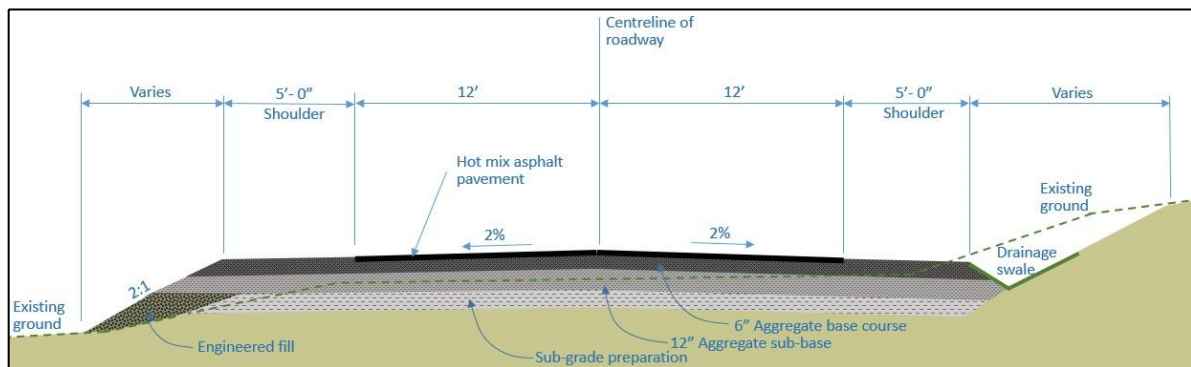


Figure 15: Typical road cross-section. Based on the design standard developed for Kosrae circumferential road extension project (Barret Consulting Group Inc., 1987). Source: Project Proposal Document.

Several activities have been or will be undertaken to design and prepare for future construction of the total distance of the Malem-Utwe inland road and access routes as follows:

- Light impact vegetation clearance (completed)
- Full topographic survey (completed by design engineers)
- Full survey by Kosrae's Historic Preservation Office (completed)
- Full geological survey (completed by design engineer)
- Detailed design for each section of road (underway by design engineer)
- Procurement of companies to provide the goods and services to support DTI in construction of the road
- Future construction of the road (including earthworks and land clearance)

The original project proposal document states that the proposed inland road between Malem and Utwe will be 3.6 miles (5.8km) in length made from a combination of access roads, existing farm road and new road construction. There has been a budget of USD\$788,000 allocated for this activity to complete the design of the road to a sealed, asphalted level.

### 2.3.3 Kosrae Road Analysis of Alternatives

The Cost Benefit Analysis (CBA) report for this activity looked at several alternatives from a CBA perspective. Environmentally and socially, these same key alternatives are discussed below:

**Construct road to asphalt level in first instance:** There are several potentially significant impacts identified in this ESMP which are linked to erosion and sedimentation. The primary factors which will control the scale of this impact are (i) project budget and (ii) time lag between project completion and upgrading road to asphalt surface. As there are unknowns over both of these factors, we cannot

be certain of the long-term impacts of this project. One alternative to the proposed activity is for the construction of the road to sub-base level be postponed and instead, this project be used to develop highly detailed design of the road to include asphalt level, this ESMP would be expanded to become an EIA to include all works to complete the road to an asphalt surface, develop a full detailed budget for the road, undertake any other feasibility studies needed and finalise the entire package into a procurement bid document. This package could then be used to source an adequate level of funding to complete the road construction to its final phase in one go.

In this scenario, a larger budget allocation would be given to the Paal and Mosral coastal defence upgrades to ensure that they are robust enough to secure the road for the next few years while the above takes place.

This alternative will require serious consideration by the project proponents should items (i) or (ii) above eventuate.

**Elevating Coastal Road:** This option is not considered appropriate given the predicted future impacts of climate change and the flooding risk of the low-lying coastal berm area at these sites. The costs of undertaking this would be significant, and it doesn't fall into line with the Kosrae States long term vision for climate resilient infrastructure as described in the Kosrae Shoreline Management Plan (KSMP). This ESMP and the CBA both agree that this is not a suitable alternative.

## 2.4 Land Requirements

The Malem to Utwe inland road passes through 86 parcels of land each of which requires an easement to be signed by the correct landowner and then registered with the Attorney General's office. The final alignment has been planned to avoid the resettlement of any residences on these land parcels. Ongoing consultations throughout the project planning and design stages continue to reinforce the landowners support of this activity and the confirmation that easements will be signed on a voluntary basis by landowners.

For any instances of objection to the routing of the road by landowners, the project team will in the first instances look to make small adjustments in the alignment to avoid any potential negative impacts on landowners. At this advanced stage in obtaining signed easements, there is only one case of an objection to the route which has been resolved by re-routing the road approximately 10m to the south around the landowner's boundary to avoid his garden area.

These land easements fall under the definition of voluntary donations as, according to the Adaptation Fund's principle on Involuntary Resettlement, the landowner has the right to refuse to sign without any repercussions or recrimination.

Component 2 will require the installation of water security interventions which are designed to be accessible to the entire community. It is anticipated that all interventions should be installed on government or communal lands on the island. However, if there are no suitable public lands, private lands may have to be used. If this is the case, the landowner would have to sign an easement to allow long term access to his lands for this purpose and also agree (depending on the type of intervention installed) to manage the land use around the intervention (as per the stipulations in this ESMP) to prevent contamination from, for e.g. pig pens.

At the project level it is important to note that, while not anticipated, if the national or state governments seek to use their legal rights to acquire the land of any landowner who refuses to sign an easement for any project activity, then this will be considered as involuntary resettlement and

the AF's principle on Involuntary Resettlement will be triggered and all the requirements of that principle will have to be implemented. The AF process for involuntary resettlement would be:

- 1) Provide justification for the need for involuntary resettlement by demonstrating any realistic alternatives that were explored, and how the proposed involuntary resettlement has been minimized and is the least harmful solution.
- 2) Describe in detail the extent of involuntary resettlement, including the number of people and households involved, their socio-economic situation and vulnerability, how their livelihoods will be replaced, and the resettlement alternatives and/or the full replacement cost compensation required whether the displacement is temporary or permanent.
- 3) Describe in detail the involuntary resettlement process that the project/programme will apply, and the built-in safeguards to ensure that displaced persons shall be informed of their rights in a timely manner, made aware of the grievance mechanism, consulted on their options, and offered technically, economically, and socially feasible resettlement alternatives or fair and adequate compensation. This also should include an overview of the applicable national laws and regulations.
- 4) Justify the conclusion that the involuntary resettlement is feasible.
- 5) Describe the adequacy of the project/programme organisational structure to successfully implement the involuntary resettlement as well as the capacity and experience of the project/programme management with involuntary resettlement.
- 6) Build awareness of involuntary resettlement and the applicable Principles and procedures of the project/programme.

## 3 Policy, Legal and Administration Framework

### 3.1 National and State Legislation

#### 3.1.1 Environmental Legislation

The legal instruments that are the foundation of FSM's environmental safeguards legal regime are 'Federated States of Micronesia Environmental Protection Act 1999' and the 'Environmental Impact Assessment Regulations 1989'. National policy documents which contains provisions related to the principles and elements of the environmental safeguards are the 'Federated State of Micronesia's State-Wide Assessment and Resource Strategy 2010-2015+', 'Federates States of Micronesia's Strategic Development Plan 2004-2023' and 'Nation Wide Integrated Disaster Risk Management and Climate Change Policy 2013'.

The FSM Environmental Protection Act 1999 states that an Environmental Impact Assessment can only be carried out if a project is likely to have potential environmental risks and impacts.

Under Principle 1 of the Adaptation Fund Environmental and Social Policy (Compliance with the Law) the project activities were screened against the Environmental Protection Act and it has been determined that the water security and sanitation interventions under Component 2 do not require a separate environmental impact assessment as it is considered to be low risk with little to no adverse environmental impacts.

The 2016 EIS for Component 3 of the project concluded that the environmental impacts from the proposed inland road are low to moderate and can be adequately controlled, however subsequent assessment under this current ESMP has identified some moderate to significant potential impacts.

##### 3.1.1.1 Environmental Framework for Kosrae

Kosrae has enacted legislation and prepared a range of resource and management plans to give effect to its responsibilities in relation to the management, protection and conservation of the environment and natural resources (KIRMA, 2014). These responsibilities are principally implemented by the Kosrae Island Resource Management Authority (KIRMA), a semi-autonomous government agency, which is mandated to: "protect the environment, human health, welfare and safety and to abate, control and prevent pollution or contamination of air, land and water by balancing the needs of economic and social development with those of environmental quality and adopting regulations and pursuing policies which, to the maximum extent possible, ensure that economic and social development is environmentally sustainable" (Kosrae State Code, Section 19.101).

Under Title 19 of the Kosrae State Code and the Regulations for Development Projects KIRMA have responsibilities and powers to administer a development permit system. Where a potential project may have significant impact on the environment, these regulations require an Environmental Impact Assessment (EIA).

This assesses the physical, ecological, aesthetic, cultural, economic, social, or health effects or impacts of a proposed activity on the environment, whether direct, indirect or cumulative. The Environment Impact Statement describes the potential effects or impacts on the environment in sufficient detail so as to allow the assessors (KIRMA, the Board of Commissioners, and stakeholders) to make a comparison of the alternatives that can be taken to avoid, minimize, rectify, reduce or eliminate, or compensate for the impact of the proposed activity. This assessment process concludes with a decision by the Board of Commissioners to issue a development review permit,

subject to conditions that will avoid, minimize or eliminate the effects or impacts of the proposed activity on the environment. The process is detailed in full in KIRMA's guidance document: Environmental impact assessment in the State of Kosrae, FSM (KIRMA, 2014). The project has completed all applicable EIA steps.

The road construction activity received no objections from the public and communities held in Malem and Utwe communities (June 2016). The KIRMA Board approved the EIS on the 15 September 2016 and a permit was issued with conditions, and there were no appeals to the decision. Subsequent to this and following the safeguards audit of the EIS and original ESMP in July 2019, a new permit will need to be applied for based on this updated ESMP.

The reconstruction of the coastal defences at Paal and Mosral (component 3.2) have been approved following consideration of the proposal and the initial environmental and social impact screening document, KIRMA advised that no specific EIS was needed for this activity. A permit from KIRMA will be required, and the application will be made based on this ESMP.

#### *3.1.1.2 Earthworks Permit for Kosrae Road Construction*

The design and future construction of the road will need to consider the following regulations which apply to the Kosrae inland road design and construction activity and state:

- 1) All earthmoving activities within the Federated States of Micronesia shall be conducted in accordance with these regulations and in such a way as to prevent accelerated erosion and accelerated sedimentation. To accomplish this, all persons engaging in earthmoving activities shall design, implement, and maintain erosion and sedimentation control measures which effectively prevent accelerated erosion and accelerated sedimentation. The erosion and sedimentation control measures must be set forth in a plan, must always be available and the site of the project, and must be filed with the FSM Department of Resources and Development.
- 2) The erosion and sedimentation control plan should be prepared by a person trained and experienced in erosion and sedimentation control methods and techniques. The erosion and sedimentation control plan should be prepared to prevent acceleration of erosion and acceleration of sedimentation and shall consider all factors which contribute to erosion and sedimentation, including, but not limited to the following: topographic and/or hydrographic features of the project area; the types, depth, slope and areas of the soils, coral and/or reef; the original state of the area as to plant and animal life; whether any coral reef which may be affected by the earth moving is alive or dead; the proposed alteration to the area; the amount of runoff from the project area; the staging of earthmoving activities; temporary control measures and facilities for use during earthmoving activity; permanent control measures and facilities for long term protection and; a maintenance program for the control facilities including disposal of materials removed from the control facilities or a project area.
- 3) The FSM Earthworks Regulations (section 2.3) provides control measures and facilities which shall be incorporated into all earthmoving activities.
- 4) A permit must be obtained from the FSM Department of Resources and Development before any earthworks commence for this project. Applications shall be on the prescribed form and shall be accompanied by an Erosion and Sedimentation Control Plan.

#### *3.1.2 Other Legislations and Codes*

Table 2: Summary of key regulations applicable to this project

Legislation	Applicability to Project
Kosrae State Code	Covers the state regulations pertaining to The Land Council, Environment, Land Development and Road Safety
Yap State Code	Cover the leases and use of public lands, protection of marine and water resources, environmental quality protection, land use controls and public health
Pohnpei State Code	Covers sanitary and toilet facilities for the state, construction of facilities, environmental protection, public land
Chuuk State Code	Covers health and sanitation, environmental protection and preservation and land management
FSM National Code	Provides national regulations for historical sites and antiquities, public health safety and welfare and labour

### 3.2 Adaptation Fund Safeguard Policies

The Adaptation Fund Environmental and Social Safeguard Policy requires that all projects be screened for their environmental and social impacts, that those impacts be identified, and that the proposed project be categorised according to its potential environmental and social impacts. Regardless in which category a project is screened, all environmental and social risks shall be adequately identified and assessed by the IE in an open and transparent manner with appropriate consultation.

The scope of the environmental and social assessment shall be commensurate with the scope and severity of potential risks. The assessment should assess all potential environmental and social risks and include a proposed risk management plan, or in this case an Environmental and Social Management Plan.

All projects supported by the AF shall be designed and implemented to meet the ESS Policy principles, although it is recognised that depending on the nature and scale of a project not all principles will be relevant to every project.

Initial safeguards screening was undertaken in 2016 and was subsequently audited in July 2019 where several discrepancies between the AF ESS Policy and assessment were identified. Updated screening has been carried out in accordance with the AF ESS policy and the policy guidance document. This updated ESMP is the safeguard instrument for the FSM AF project's technical and physical investments.

SPREP also implements all projects according to their own Environmental and Social Safeguards Policy through a series of 'Environmental and Social Standards'. As an Implementing Entity for AF, SPREP are in the process of auditing and updating their ESS to ensure that they comply with and fully encompass the AF policy. The table below highlights the SPREP standards in relation to the AF principles.

Table 3: Adaptation Fund Safeguard Principles assessment against project activities

AF & SPREP ESS Principles	Applicability	Applicability to Project
<p><b>Principle 1: Compliance with the Law</b>  <i>Projects/programmes supported by the Fund shall be in compliance with all applicable domestic and international laws.</i></p> <p><b>SPREP Social and Environmental Policy (Clause 3)</b></p>	<p>The IE will ensure that the project will comply with the applicable domestic and international law. Needs a description of the regulatory framework for any project activity that may require permits.</p> <p>This principle always applies to all AF funded projects.</p>	<p>Permits will be needed for the following activities:                      Coastal reinforcements (Kosrae)                      Earth works (Kosrae)</p> <p>The following regulations are applicable for this project:</p> <ul style="list-style-type: none"> <li>• Kosrae State Code</li> <li>• Kosrae Regulations for Development Projects</li> <li>• FSM Earthmoving regulations</li> <li>• FSM Labour Act</li> <li>• Yap State Code</li> <li>• Pohnpei State Code</li> <li>• Chuuk State Code</li> <li>• FSM National Code</li> <li>• Basel and Waigani Convention</li> <li>• Convention on Biological Diversity</li> </ul>
<p><b>Principle 2: Access and Equity</b>  <i>Projects/programmes supported by the Fund shall provide fair and equitable access to benefits in a manner that is inclusive and does not impede access to basic health services, clean water and sanitation, energy, education, housing, safe and decent working conditions, and land rights. Projects/programmes should not exacerbate existing inequities, particularly with respect to marginalized or vulnerable groups.</i></p> <p><b>SRPEP Principle 1:</b>                      Human Rights</p>	<p>The process of allocating access to project benefits should be fair and impartial. A fair process treats people equally without favouritism or discrimination, and an impartial process treats all rivals or disputants equally. Furthermore, the project will be designed and implemented in a way that will not impede access of any group to the essential services and rights mentioned in the principle.</p>	<p>The exact sites for installation of water security interventions in Yap, Chuuk and Pohnpei are not yet determined. Under this principle, the guidelines state that allocating access to Project benefits should be fair and impartial. If the site selection and consultation process of Component 2 is not carefully planned, then there is the risk that there may be bias and therefore lack of access and equity to the improved water resources</p> <p>To demonstrate compliance with this principle, the ESMP describes the process of allocating and distributing the Component 2 interventions and by showing how this process ensures fair and impartial access to benefits. One risk of fair access is the installation of interventions on private land without securing long term access to the interventions. Risks of this type are addressed in this ESMP.</p>
<p><b>Principle 3 – Marginalised and Vulnerable Groups.</b>  <i>Projects/programmes supported by the Fund shall avoid imposing any disproportionate adverse impacts on marginalized and vulnerable groups including children, women and girls, the elderly, indigenous people, tribal groups, displaced people,</i></p>	<p>Impacts on marginalised and vulnerable groups must be considered so that such groups do not experience adverse impacts from the project that are disproportionate to those experienced by others.</p>	<p>This principle is not triggered by the project as there are no disproportionate adverse impacts foreseen from the various components due to the triggering of Principle 2.</p>

<p><i>refugees, people living with disabilities, and people living with HIV/AIDS. In screening any proposed project/programme, the implementing entities shall assess and consider particular impacts on marginalized and vulnerable groups.</i></p> <p><b>SPREP Principle 1:</b> Human Rights <b>SPREP Principle 3:</b> Child Protection <b>SPREP Safeguard 1:</b> Assessment and Management of Environmental and Social Risks and Impacts (requirement 3)</p>		
<p><b>Principle 4 – Human Rights</b> <i>Projects/programmes supported by the Fund shall respect and where applicable promote international human rights.</i></p> <p><b>SPREP Principle 1:</b> Human Rights</p>	<p>Promotion of human rights in the project will be achieved by creating awareness with all involved in the project operations, including design, execution, monitoring, and evaluation, about the Universal Declaration of Human Rights as an overarching principle in the implementation of the project.</p>	<p>This principle is triggered by all projects funded by AF.</p> <p>The AF bases this principle on the United National Declaration of Human Rights and requires that at a minimum, and regardless of whether the country is a Party to them, the nine-core international human rights treaties will be monitored.</p> <p>The project will adhere to this principle through contractual clauses with any contractors and through oversight by the IE</p>
<p><b>Principle 5 – Gender Equality and Women’s Empowerment</b> <i>Projects/programmes supported by the Fund shall be designed and implemented in such a way that both women and men 1) have equal opportunities to participate as per the Fund gender policy; 2) receive comparable social and economic benefits; and 3) do not suffer disproportionate adverse effects during the development process.</i></p> <p><b>SPREP Principle 2:</b> Gender Equality</p>	<p>Gender equality refers to the equal rights, responsibilities, opportunities and access of women and man and boys and girls as well as the equal consideration of the respective interests, needs, and priorities. To ensure gender equality, measures often need to be taken to compensate or reduce disadvantages that prevent women and men from otherwise operating on an equitable basis. Gender equality and women’s empowerment must be applied in the project design and its implementation regardless of the legal and regulatory framework in which the project is set.</p>	<p>There are known links between water supply, WASH and the role of the females in the house. It is therefore critical to ensure that ongoing consultation is undertaken with a fair gender representation throughout project implementation.</p> <p>The ESMP identifies key stakeholders or key stakeholder groups for women’s representation in consultations; provides specific instruct the implementation team to include woman in all future consultations; includes parameters for monitoring gender equality and women’s empowerment in the ESMP monitoring plan.</p>
<p><b>Principle 6 – Core Labour Rights</b> <i>Projects/programmes supported by the Fund shall</i></p>	<p>The International Labour Organisation (ILO) core labour standards are stated in the 1998 ILO Declaration of Fundamental</p>	<p>This principle is applicable for all AF projects.</p>

<p><i>meet the core labour standards as identified by the International Labour Organisation.</i></p> <p><b>SPREP Safeguard 4:</b> Labour and Working Conditions</p>	<p>Principles and Rights at Work. Regardless of whether the countries where the AF's projects are implemented have ratified the conventions, in the context of AF funded projects the IE will respect, promote and realise in good faith the principles of the ILO and ensure that they are respected and realised in good faith by the EE and other contractors.</p>	<p>As FSM has not ratified the ILO, the ESMP demonstrates how the ILO core labour standards will be incorporated in the design and the implementation of the project as appropriate.</p> <p>The project will adhere to this principle through contractual clauses with any contractors and also through oversight by the IE.</p>
<p><b>Principle 7 – Indigenous People</b> <i>The Fund shall not support projects/programmes that are inconsistent with the rights and responsibilities set forth in the UN Declaration on the Rights of Indigenous Peoples and other applicable international instruments relating to indigenous peoples.</i></p> <p><b>SPREP Safeguard 9:</b> Indigenous Peoples</p>	<p>This policy is applied with the project affects, directly or indirectly, indigenous people.</p>	<p>Most of the population of the project sites are indigenous, in the sense of having ancestral attachment to their land which is still important in the livelihoods of the majority who are rural dwellers. This reliance on natural resources and both customary and legal rights are recognised under Federal and State.</p> <p>As Indigenous Peoples are the overwhelming majority of direct project beneficiaries safeguard measures should be been integrated into the project's overall design through the ESMP. They include: (i) Free, prior, and informed consultation leading to broad community support during project preparation; (ii) Measures to ensure culturally appropriate processes and benefits; (iii) Measures to ensure that adverse impacts are mitigated and (iv) Measures for disclosing key project documents in a language understandable to them.</p> <p>Community consultation and regular engagement with the community is integral and the ESMP stipulates that this will be undertaken through the life of the project.</p>
<p><b>Principle 8 – Involuntary Resettlement</b> <i>Projects/programmes supported by the Fund shall be designed and implemented in a way that avoids or minimizes the need for involuntary resettlement. When limited involuntary resettlement is unavoidable, due process should be observed so that displaced persons shall be informed of their rights, consulted on their options, and offered technically, economically, and socially</i></p>	<p>This policy refers to both physical displacement (relocation or loss of shelter) and to economic displacement (loss of assets or access to assets that leads to loss of income sources or other means of livelihood). Resettlement is considered involuntary when affected persons or communities do not have the right to refuse land acquisition or restrictions on land use that result in physical or economic displacement because of either:          1) lawful expropriation or temporary or permanent</p>	<p>Component 2 will require the installation of water security interventions which are designed to be accessible to the entire community. It is expected that all interventions should be installed on government or communal land on the islands. However, if there are no suitable public lands, private lands may have to be used. If this is the case, the landowner would have to sign an easement to allow long term access to his lands for this purpose and also agree (depending on the type of intervention installed) to manage the land use around the intervention to prevent contamination from, for e.g. pig pens. This easement will only be entered on a voluntary donation basis.</p>

<p><i>feasible resettlement alternatives or fair and adequate compensation.</i></p> <p><b>SPREP Safeguard 7:</b>                  Land Acquisition and Involuntary Resettlement</p>	<p>restrictions on land use, and 2) negotiated settlements in which the buy can resort to expropriation or impose legal restrictions on land use if negotiations with the seller fail. This principle does not apply to resettlement resulting from voluntary land transactions in which the seller is not obligated to sell, and the buyer cannot resort to expropriation or other compulsory processes sanctioned by the legal system of the host country if negotiations fail.</p>	<p>For component 3, it is expected that all 83 easements will be through voluntary donation as defined in this principle.</p> <p>If any state or national government seeks to use their legal rights to acquire the land of any landowner who refuses to sign an easement, this will be considered as involuntary resettlement and this principle will be triggered and all the requirements of this principle will have to be implemented.</p> <p>The AF process for involuntary resettlement would be:</p> <ol style="list-style-type: none"> <li>1) Provide justification for the need for involuntary resettlement by demonstrating any realistic alternatives that were explored, and how the proposed involuntary resettlement has been minimized and is the least harmful solution.</li> <li>2) Describe in detail the extent of involuntary resettlement, including the number of people and households involved, their socio-economic situation and vulnerability, how their livelihoods will be replaced, and the resettlement alternatives and/or the full replacement cost compensation required whether the displacement is temporary or permanent.</li> <li>3) Describe in detail the involuntary resettlement process that the project/programme will apply, and the built-in safeguards to ensure that displaced persons shall be informed of their rights in a timely manner, made aware of the grievance mechanism, consulted on their options, and offered technically, economically, and socially feasible resettlement alternatives or fair and adequate compensation. This also should include an overview of the applicable national laws and regulations.</li> <li>4) Justify the conclusion that the involuntary resettlement is feasible.</li> <li>5) Describe the adequacy of the project/programme organisational structure to successfully implement the involuntary resettlement as well as the capacity and experience of the project/programme management with involuntary resettlement.</li> <li>6) Build awareness of involuntary resettlement and the applicable Principles and procedures of the project/programme.</li> </ol>
---	---	--

<p><b>Principle 9 – Protection of Natural Habitats</b>  <i>The Fund shall not support projects/programmes that would involve unjustified conversion or degradation of critical natural habitats, including those that are (a) legally protected; (b) officially proposed for protection; (c) recognized by authoritative sources for their high conservation value, including as critical habitat; or (d) recognized as protected by traditional or indigenous local communities.</i></p> <p><b>SPREP Safeguard 8:</b>          Biodiversity          Conservation and Sustainable Management of Living Natural Resources</p>	<p>The CBD defines a ‘habitat’ as the place or type of site where an organism or population naturally occurs. ‘Critical natural habitat’ refers to habitats that are not man-made and that fulfil a critical role for an organism or a population that in the absence or disappearance of that habitat might be severely affected or become extinct. The IE will identify: 1) the presence in or near the project area of natural habitats, and 2) the potential of the project to impact directly, indirectly or cumulatively upon natural habitats.</p>	<p>Under the AF definitions in this principle, ‘natural habitats’ are within the Kosrae inland road construction footprint but none of these are considered to be ‘critical natural habitats’. Under the Kosrae Land Use Plan the road alignment passes through ‘Areas of Particular Concern’ and ‘Special Consideration Districts’.</p> <p>This ESMP describes these areas, explains why they cannot be avoided and discusses the potential impacts. For each affected critical natural habitat, provide an analysis on the nature and the extent of the impact including direct, indirect, cumulative, or secondary impacts; the severity or significance of the impact; and a demonstration that the impact is consistent with management plans and affected area custodians.</p>
<p><b>Principle 10 – Conservation of Biological Diversity</b>  <i>Projects/programmes supported by the Fund shall be designed and implemented in a way that avoids any significant or unjustified reduction or loss of biological diversity or the introduction of known invasive species.</i></p> <p><b>SPREP Safeguard 5:</b>          Biodiversity and Ecosystem Services  <b>SPREP Safeguard 8:</b>          Biodiversity          Conservation and Sustainable Management of Living Natural Resources</p>	<p>The IE will use the CBD definitions of biological diversity to identify: 1) the presence in or near the project area of important biological diversity; 2) potential of a significant or unjustified reduction or loss of biological diversity, and 3) potential to introduce known invasive species.</p>	<p>Under the definition of the AF, biological diversity concerns not only living organisms of all taxa but also ecosystem processes, habitats, hydrological cycles, processes of erosion and sedimentation, landscapes, etc.</p> <p>Additionally, the ESMP makes the connection between the Kosrae road construction and the potential impacts on marine biodiversity through poor erosion control, describes the marine habitat, the scale of the potential marine impacts and any protective measures that are required.</p> <p>The areas of upland forest which will need to be cleared through the future Kosrae road realignment plan can be considered important biological diversity. There will be loss of this biodiversity through clearance and the potential to introduce invasive species through these works.</p> <p>As required in the principle, this ESMP describes the elements of known biological diversity importance in the road alignment and describes why the impacts cannot be avoided and what measures will be taken to minimise these impacts.</p> <p>The ESMP also provides practical avoidance or protective measures to minimise the impacts.</p>

<p><b>Principle 11 – Climate Change</b>  <i>Projects/programmes supported by the Fund shall not result in any significant or unjustified increase in greenhouse gas emissions or other drivers of climate change.</i></p> <p><b>SPREP Principle 4:</b>                  Climate Change</p>	<p>The main drivers of climate change that are considered here are the emission of carbon dioxide gas from the use of fossil fuel and from changes in land use, methane and nitrous oxide emissions from agriculture, emission of hydrofluorocarbons, perfluorocarbons, sulphur hexafluoride, other halocarbons, aerosols, and ozone.</p>	<p>Not applicable to this project</p>
<p><b>Principle 12 – Pollution Prevention and Resource Efficiency</b>  <i>Projects/programmes supported by the Fund shall be designed and implemented in a way that meets applicable international standards for maximizing energy efficiency and minimizing material resource use, the production of wastes, and the release of pollutants.</i></p> <p><b>SPREP Safeguard 5:</b>                  Resource Efficiency and Pollution Prevention</p>	<p>There are two distinct aspects to this principle. Project shall on the one hand minimise in a reasonable and cost-effective way the resources that will be used during implementation. This applies to all sources and forms of energy, to water, and to other resources and materials inputs. On the other hand, the project will minimise the production of waste and the release of pollutants.</p>	<p>Component 3 has the potential to produce pollution and the contractor will be required to produce a ‘Waste and Pollution Prevention Management Plan’ as detailed in the AF ESS guidelines.</p> <p>Component 2 may require the production of concrete for any construction work during installations and this ESMP provides the measures that must be implemented to avoid spillage and pollution.</p>
<p><b>Principle 13 – Public Health</b>  <i>Projects/programmes supported by the Fund shall be designed and implemented in a way that avoids potentially significant negative impacts on public health.</i></p> <p><b>SPREP Safeguard 6:</b>                  Community Health, Safety and Security</p>	<p>Possible public health impacts of a project can be determined by assessing its impact on a range of so-called determinants of health. Public health is determined not just by access to medical care and facilities and lifestyle choices, but also by a much broader set of social and economic conditions in which people live.</p> <p>The project may demonstrate that it will not cause potentially significant negative impacts on public health by screening for possible impacts and including the results of the screening. The outcome of the screening should be used to demonstrate compliance with the principle if there are no potentially significant negative impacts on public health are likely.</p>	<p>There are clear impact risks during the component 3 construction activities and operational phase from movement of construction machinery, changes in traffic patterns through the village and potential increase in sediment loading in the village streams and coastal environment, etc.</p> <p>There are also potential public health impacts from the water security interventions in component 2 and this ESMP provides mitigation measures and strategies.</p>
<p><b>Principle 14 – Physical and Cultural Heritage</b></p>	<p>The IE will identify the presence of cultural heritage in or near the project.</p>	<p>The nature of the known cultural sites along the Kosrae road alignment have been identified and described in the EIS. The EIS</p>

<p><i>Projects/programmes supported by the Fund shall be designed and implemented in a way that avoids the alteration, damage, or removal of any physical cultural resources, cultural sites, and sites with unique natural values recognized as such at the community, national or international level. Projects/programmes should also not permanently interfere with existing access and use of such physical and cultural resources.</i></p> <p><b>SPREP Safeguard 10:</b> Cultural Heritage</p>		<p>also provides a chance find procedure for discovery of any as yet unknown cultural site.</p> <p>The ESMP includes the chance find procedure and includes measures to be taken during construction to protect these known and as yet unknown sites.</p>
<p><b>Principle 15 – Lands and Soil Conservation</b>  <i>Projects/programmes supported by the Fund shall be designed and implemented in a way that promotes soil conservation and avoids degradation or conversion of productive lands or land that provides valuable ecosystem services.</i></p> <p><b>SPREP Safeguard 8:</b> Biodiversity Conservation and Sustainable Management of Living Natural Resources</p>	<p>This principle concerns the stewardship of land to either be maintained in its natural state where possible, or if it is converted to promote and protect its functioning. Soil conservation refers to a set of measures to prevent, mitigate or control soil erosion and degradation. There are two aspects to the principle: promotion of soil conservation and avoidance of degradation or conversion of valuable lands. This applies to soils and lands directly affected by the project as well as those influenced indirectly, or as a secondary or cumulative effect. Soil conservation should be incorporated in project design and implementation.</p> <p>The IE will identify: 1) productive lands and/or lands that provide valuable ecosystem services within the project area. If such land exists, the IE will identify and describe: the lands; project activities that may lead to land degradation; reasons why using these lands is un- avoidable and the alternatives that were assessed, and; measures that will be taken to minimise productive land</p>	<p>This principle is applicable to the Kosrae road design activity.</p> <p>The soil conservation portion of this principle requires projects to have good erosion and sedimentation controls in place. As this is an important part of the Kosrae State regulations, this is covered in detail in the EIS and an Erosion and Sedimentation Control Plan has been developed for this activity.</p> <p>This ESMP applies the requirements of this principle including analysis of alternatives, measures to minimise degradation or ecosystem service impacts.</p>

	degradation or ecosystem service impacts.	
--	--	--

### 3.2.1 Gender Action Plan

Gender is a strategic priority of the Adaptation Fund and all projects and implementing partners shall strive to uphold women’s rights as universal human rights and to attain the goal of gender equality and equal treatment of women and men, including equal opportunities for access to Fund resources and services, in all Fund operations through a gender mainstreaming approach.

The AF’s gender policy has the following objectives:

- i. To ensure that the AF will achieve more effective, sustainable and equitable adaptation outcomes and impacts in a comprehensive manner in both its internal and external procedures;
- ii. To provide women and men with an equal opportunity to build resilience, address their differentiated vulnerabilities, and increase their capacity to adapt to climate change impacts; recognizing the need for targeted efforts in order to ensure women’s participation;
- iii. To address and mitigate against assessed potential project/programme risks for women and men in relation to concrete adaptation actions financed by the AF;
- iv. To contribute to addressing the knowledge and data gaps on gender-related vulnerabilities and to accelerate learning about effective gender-equal adaptation measures and strategies; and
- v. To consult with affected women and men actively, considering their experiences, capabilities and knowledge throughout the AF processes.

## 5 Stakeholder Engagement

Stakeholders will require engagement across the project, for physical investments, policy development and other aspects.

### 5.1 Stakeholder Identification

A stakeholder is defined as a person or group who has an interest in a particular decision or activity relating to the project, either as an individual or as a representative of a group. This includes people who can influence a decision, or can influence actions, as well as those affected by it.

For this project, stakeholder groups will vary across the project activities and sites. Stakeholders have been and will continue to be identified on an ongoing basis by:

- Identifying the various categories of parties who may be affected by or interested in the project; and
- Identifying specific individuals or organisations within each of these categories taking into account:
  - The expected impact area of the project, that is the geographic area over which it may cause impacts (both positive and negative) over its lifetime, and therefore the localities within which people and businesses could be affected;
  - The nature of the impacts that could arise and therefore the types of government bodies, NGOs, academic and research institutes and other bodies who may have an interest in these issues.

### 5.2 Stakeholder Groups

Primary stakeholder groups applicable to the project are listed and described below.

Category	Group	Relevance
National Government	Department of Environment, Climate Change & Emergency Management (DECCEM)	Environment Division: This division is responsible for conservation, protection and sustainable utilisation of living and non-living natural resources. Climate Change Division: This division is responsible for management and coordination of FSM's measures and response to the threats and impacts of climate change.
Local Governance	Chuuk Department of Public works, Disaster Office	
	Yap EPA, Yap Budget and Planning	
	Pohnpei Department of Transportation and Infrastructure	
	Kosrae Governor's Office	Responsible for management of government lands
	Kosrae Island Resource Management Authority	Responsible for issuing environmental development consents
	Kosrae Department of Transport and Infrastructure	Responsible for Kosrae Roads design, construction and maintenance
	Kosrae Office of Development Assistance	

Category	Group	Relevance
	Municipality Councils and Traditional Leaders Village Mayors	
Local Groups and NGOs	Kosrae Historic Preservation Office	Responsible for identifying, protecting and managing areas of cultural and historical importance on Kosrae.
	Kosrae Conservation and Safety Organisation	Tuvalu Association of NGOs (TANGO) provides a policy voice within government and provides information and communication to its 48 members and the local community.
	Women’s Groups	Island representatives of the Chuuk Women’s Council, Yap Women’s Associations, Pohnpei Women’s Council and the Kosrae Women Association
	Disabled Persons Organisations (DPO)	Pohnpei Consumers Organisation (PCO) whos mission it is to protect and promote the human, civil and legal rights of individuals with disabilities through the provision of information and advocacy. The PCO was the founding DPO in FSM and there now a DPO in each state coordinated by the newly formed National Coalition of DPOs.
	Youth Groups	The FSM Youth Council serves as an umbrella organisation for all FSM state youth clubs and youth councils while providing a bridge between national government and the youth.
	Island Church Groups	Representatives of the main church groups on each of the islands
Project Affected Communities and Individuals	Local Communities	The construction phase is likely to have minor short-term impacts on the communities in and around the project sites (works, ancillary and haulage routes). The operational phase of the project is likely to have long term positive impacts on the community. Consultation for both of these phases will be critical.
	Public	The wider Fongafale public will be stakeholders in the development and implementation of the TvICT Project as they will be impacted through changes to access to communications once the cable is commissioned.

### 5.3 Stakeholder Engagement and Consultation Plan (SECP)

The SECP needs to be implemented, updated and refined throughout the lifecycle of the Project. During this process the focus and scope of the SECP will change to reflect the varying stages of project implementation and to encompass any changes to project design. The implementation plan is included in Table 4.

The mode of consultation will vary according to the participants, but in all cases will promote participation by ensuring that the venue is accessible, the timing convenient and the manner of conduct of the consultation socially and culturally appropriate. Consultations will be announced to give sufficient notice for participants to prepare and provide input to project design.

Minutes will be recorded for all consultation meetings. Consultations undertaken prior to finalisation of the ESMP have been addressed and incorporated into management measures where appropriate throughout the ESMP. For subsequent consultations, the EE will be responsible for taking any comments forward to either the IE or the Contractor for incorporation. Minutes of consultations and actions taken based on those comments will be included in project reporting.

### 5.3.1 Implementation Plan

The Implementation Plan (Table 4) for the Project constitutes the following components:

**Activity:** the various operational consultation activities that will be undertaken as part of the SECP

**Objective:** the target that each activity needs to reach

**Stakeholder:** the various stakeholders to be targeted during implementation of the SECP activity;  
 and

**Medium:** the method by which the engagement or consultation will be done

The EE will be responsible for early consultations and engagement, but once construction starts, The Kosrae DTI, the KIRMA Project Officer and any contractors will also have engagement responsibilities, primarily around the strengthening of Kosrae coastal developments and the installation of water security interventions.

Table 4: Stakeholder Engagement and Consultation Implementation Plan

No	Project Activity	Timetable	Objective	Stakeholders	Medium
<b>A: Water Security Interventions</b>					
<b>A1</b>	Selection of installation sites	From project preparation through to final selection.	Identify and select sites for installations/upgrades which adhere to the safeguards requirements and have community support	Local Governance: Yap, Chuuk Pohnpei  Local groups and NGOs: Yap, Chuuk, Pohnpei  Village leaders and communities	One-on-one meetings  Group meeting with refreshments  Structured group meeting with refreshments
<b>A2</b>	Disclosure of the ESMP	On completion of ESMP	To disclose ESMP	All identified	Public flyer, radio announcement, website, hard copies.
<b>A3</b>	Commencement of Works	Two weeks before commencement of any works.	To reconfirm ongoing consultation, feedback and GRM processes	Island Councils  Women's Groups  Community  Site occupants	Community Notice Boards  Community Meeting
<b>B: Kosrae Road Design</b>					
<b>B1</b>	Disclosure of ESMP	On completion of ESMP	To disclose ESMP	All identified	Public flyer, radio announcement, website, hard copies.

No	Project Activity	Timetable	Objective	Stakeholders	Medium
<b>C: Kosrae Coastal Defences</b>					
<b>C1</b>	Disclosure of ESMP	On completion of ESMP	To disclose ESMP	All identified	Public flyer, radio announcement, website, hard copies.
<b>C2</b>	Commencement of Works	Two weeks before commencement of any works.	To advise of construction schedule, reconfirm management measures and remind of GRM process	Island Councils Women's Groups Community Site occupants	Community Notice Boards Community Meeting

### 5.3.2 Resources and Responsibilities

The implementation of the SECP will be the overall responsibility of the EE, with support from the State Governments and Contractors as required. The EE Project Manager will be responsible for arranging and facilitating the meetings as it appropriate and they will also be the focal point for all stakeholder queries and contacts in relation to the implementation of the SECP or the GRM.

It is also the responsibility of the Project Manager to ensure that gender balance is achieved throughout the implementation of the SECP and should ensure culturally appropriate strategies are used to achieve this such as separate meetings for males and females, or targeting female input through women's groups.

### 5.4 Consultations to Date

Consultations of key stakeholders at state, municipal and public levels has been undertaken as part of the development of the Kosrae Environmental Impact Statement and this ESMP. Safeguard specialist led consultations have been undertaken for the road construction EIS, ESMP and KIRMA development consent as well as coastal defences works on Kosrae. Project Manager led consultations have been undertaken for the water security interventions on Yap, Chuuk and Pohnpei. These build on similar state, municipal and public consultations conducted during the development for this proposal and during the updating of the KSMP in 2013/14 for the State of Kosrae.

Several consultations were undertaken in all four states and discussed and identified environmental and social issues and risks of the project which have been addressed in this ESMP.

In Kosrae, during the EIS process, a presentation and discussion of the project was conducted with firstly, the Mayor and Council Members of both Utwe and Malem Municipalities, and immediately following this, an open public meeting in each Municipality, again also attended by the Mayors and Council Members. Following the presentation, clarifications and discussion around issues were conducted around large scale maps of the project area showing the key Kosrae components. Discussions and issues identified, including changes to the project design were captured in the EIS.

During the development of this ESMP, a safeguards consultation session was conducted on Kosrae with key governance and community stakeholders with a presentation on the additional impacts

identified and to get additional input on the proposed management measures. Discussions and issues identified have been captured in this ESMP.

### 5.5 Public Disclosure

In Kosrae, KIRMA determines whether a public hearing or consultation is required for any project application. As outlined in Kosrae's EIA process, the draft EIS is generally circulated to all State stakeholders and made available for public consultation. Stakeholders and the community have a minimum of 30 days to provide comments on the proposal. This was completed in 2016 and a final and completed EIS was endorsed.

This ESMP captures the recommended measures in the EIS and will be publicly disclosed in all project locations. This ESMP will be made available in hard copy in all village council offices.

### 5.6 Grievance Redress Mechanism

Any parties wishing to raise grievances caused by or associated with the project will be able to do so. In the first instance grievances will be managed by the PMU. Depending on the nature of the complaints, or if for any reason the complainant is unwilling to make a report to the PMU, it can submit a complaint through the Municipality Councils and/or traditional leaders.

A grievance redress mechanism (GRM) is presented below to uphold the project's social and environmental safeguards performance. The purpose of the GRM is to record and address any complaints that may arise during the implementation phase of the project and/or any future operational issues that have the potential to be designed out during implementation phase. It should address concerns and complaints promptly and transparently with no impacts (cost, discrimination) for any reports made by project affected people (APs). The GRM works within existing legal and cultural frameworks, providing an additional opportunity to resolve grievances at the local, project level.

The key objectives of the GRM are:

- Record, categorize and prioritize the grievances;
- Settle the grievances via consultation with all stakeholders (and inform those stakeholders of the solutions);
- Forward any unresolved cases to the relevant authority.

Community level grievances are most likely with the proposed project.

The following process will be used to address the issues and concerns that an affected party (AP) may have. The key point of contact for the AP will be the village council who will likely liaise directly with the Contractor, DTI or project team leader (Kosrae) or the Project Manager directly (Yap, Chuuk or Pohnpei). The party receiving the complaint will receive and document all matters and issues of concern from the local community and forward copies of all grievances to the Project Manager.

At all times it is the responsibility of the Project Manager to record, manage and close all grievances. Management of grievances may include issuing instructions to the relevant party to resolve the matter. If the Contractor receives the grievance and is able to effectively resolve the matter to the satisfaction of the AP, the Contractor will provide the Project Manager with the details who will then record the matter.

For concerns such as damage to trees or food gardens, etc., the AP will discuss this with the council, who will then raise the matter immediately with the offending party or their supervisors, if unresolved at the project site. If the concern can be addressed without delay, and the outcome is

satisfactory to the AP, the matter is closed. The Contractor will provide a report to the Project Manager as soon as the complaint has been resolved.

For more extensive complaints such as damage to buildings or land issues such project/Contractor’s encroachment on someone’s land, the Project Manager will document and record the grievance and manage the response process. APs can submit these types of complaints through any number of channels including via the village council or other third party; directly to the Contractor or project team; in writing; anonymously; verbally; etc. The complaint must be acknowledged within 24 hours of it being lodged. The timing and manner in which it will be resolved will be conveyed to the AP within 48 hours. The delegated party will provide a corrective action report to the Project Manager as soon as the action has been taken.

Should the complainant remain unsatisfied with the response of the delegated party, the complaint will be referred by the Project Manager to the IE, SPREP.

All grievances received and handled will be reported by DECEM to SPREP as the IE via periodic reporting. SPREP will review the handling of grievances to ensure they have been handled correctly.

The five-step grievance management process will be applied to the project by the following process:

*Table 5: Grievance Redress process in tabulated form*

Step	Application/How	Responsibility
Publicise the process	Develop a procedure which explains how the grievance mechanism will work on the specific project site	SPREP, DECEM
	Present the grievance mechanism at a public meeting help with affected communities	DECEM, EPA Yap, Chuck, Pohnpei; KIRMA Kosrae
Receive and register	Identify locations to receive grievances and ensure accessibility to all affected stakeholders	DECEM, EPA Yap, Chuuk, Pohnpei; KIRMA Kosrae
	Recognise that some grievances may be submitted in writing while others will be communicated verbally. All grievances are to be treated with the same level of seriousness and respect.	
	Log all complaints into a database	
Review and investigate grievances	Review and investigate grievances	EPA Yap, Chuuk, Pohnpei; KIRMA Kosrae
	Explain the process and the timeframe for the GRM process	
	Appoint an appropriate person to obtain information and investigate.	
Develop resolution options, response to grievances and closeout	Develop a proposed resolution process, involving communities where appropriate	State level – EPA Yap, Chuuk, Pohnpei; KIRMA Kosrae
	Implement the agreed solution	DECEM
	Follow-up with complainant to ensure satisfaction	
	If unsatisfied: Discuss further options. Identify local partners	

	who might be able to assist in finding solutions	
	If still unresolved, refer matter to third-party mediation or external review.	
Monitor and Evaluate	Regularly monitor the number and type of grievances received, resolved and outstanding	DECEM, SPREP
	Evaluate trends over time and stages of project development	
	Report all grievances to the SPREP via relevant periodic reporting	DECEM

SPREP will also maintain an email based grievance mechanism, so that the public can also lodge grievances directly to SPREP, should they wish to do so. Lodgment of grievances will follow the processes set out in the SPREP Fraud Manual (See website here: <http://www.sprep.org/corporate-documents/sprep-fraud-manual>).

The overall GRM for the project described above is complimented by the Kosrae EIA process which enables members of the public to make submissions and to raise issues that will be considered by the KIRMA Board prior to any decision on a Development Project application, as has been issued for component 3 activities of the project. In addition, anyone affected by the decision of KIRMA also has the right to request review of the decision under the Administrative Procedures Act (Title 2 Chapter 4), which includes agency review and further rights of appeal to the Kosrae State Court and Supreme Court of the FSM.

## 6 Environmental and Social Impacts

The project has the potential to create a variety of impacts through the implementation of the activities described in Section 2. These potential impacts can either be positive or negative depending on the receptors involved and the activity. The impact of this project on the physical, biological and social environment has been assessed to determine likelihood and identify effective mitigation measures.

There are site-specific and component specific impacts which have been identified and of those identified, only moderate to major impacts requiring specific mitigation are discussed below. All impacts (including minor) are addressed through mitigation measures included in the management plans in Section 7.

Impacts below are presented under the associated impact generating activity.

### 6.1 Water Security Investments Under Component 2

The following potential significant impacts have been identified in relation to activities under this component which provides for the installation and/or repair of rainwater harvesting systems, groundwater wells and self-composting toilets.

#### 6.1.1 Social Impacts

##### 6.1.1.1 *Installation on private lands*

1. Installation of any physical interventions on privately owned land carries the risk of limiting access if the landowner chooses to query or dispute the use of his land once the project is completed.
2. In addition to this, any interventions which involve community access to improved ground water wells on private land carry with it the need for landowner to agree to long term management of the land surrounding the wells to avoid contamination of the water source. For example, placement of pig pens, waste collection pit latrines, etc., placed near the well head has the potential to introduce contaminated leachate into the water source.

#### Protective measures

- Avoid installation or upgrades of any community water supply on private land.
- If private land is needed, easements signed and submitted with any private land owners prior to the commencement of any works. Easement should include provisions to manage or relinquish the land within a 30m circle around the well head to minimise the risk of contamination.
- Consultations with the land owners to be documented to demonstrate that any land owners have been made aware of the land use restrictions around any community ground water supply on their land.

##### 6.1.1.2 *Collection of ground water*

1. Some methods of collecting water from well heads have the potential to contaminate both the water collected and the water in the well. If the collecting scoop is stored on the ground around the well, it has the potential to collect pathogens or contaminants from the soil surrounding the well head. This then has the potential to transfer into the ground water or into the water that has been collected creating a public health risk.
2. Some existing wells are in a neglected state or were poorly designed and constructed leading to difficult in access and poor hygiene standards around the well.

3. Solar or electrical pumps are often used as a way to extract water from wells without having to 'touch' the water with a contaminated bucket or scoop. Pumps introduce a risk to the use of the well as they will inevitably break down and are often not able to be replaced or repaired in the Pacific Islands meaning communities will revert back to the bucket or scoop. Technical stakeholders to the project have strongly recommended not to use any electrical pumps.

Protective measures:

- No electrical pumps to be installed under this project.
- Use the Kiribati designed 'Tamana' pump to extract water. This pump required no electrical motor and is built from various sizes and lengths of PVC piping. This design is widely used throughout Kiribati to extract water with a great degree of success. The Tamana Pump's basic components are 25mm PVC pip, usually up to 30m long; a 50mm PVC pipe, 1m long; 1 25mm to 50mm, 45o PVC reducer bend; a 25mm elbow; a 25mm PVC male adaptor; a foot valve; and, a piston made of one-half in PVC piping<sup>4</sup>.
- Project will support activite to upgrade structure of the wells walls and cover the well heads to provide safe, easy access to the water via the Tamana pump.

#### 6.1.1.3 *Design of Self Composting Toilets*

1. If SCT are designed in such a way to allow too much light into the toilet itself the result is an over-use of bulking agent<sup>5</sup> to cover the sight of human waste. Overuse of the bulking agent will result in a poor compositing process, drying out of the pile and an increased effort to source and refill the bulking agent container. Additionally, the idea of using the SCT is not attractive to many users if they can see the waste pile as it gives the impression of sitting on top of someone else's business. Designs of SCT in the Pacific Islands have frequently neglected this aspect of design.<sup>6</sup>
2. Design of SCT toilets usually call for the use of wood and or plywood which frequently become infested with termites and then deteriorate quickly.
3. A key element in the success of a SCT is the free availability of a bulking agent. Bulking agents provide a dry high carbon source which is critical for the composting process. A significant problem with SCTs in the Pacific Islands has been to find a free bulking agent to use with the toilets. Where no bulking agent is used, the toilet won't work well, will likely smell and the composting process is disrupted. People are likely to abandon SCT if they do smell. Most SCT deigns used in the Pacific Islands are based on a NZ or Australian model which used sawdust as the bulking agent. This is often not available in an atoll island. Casuarina needles have been used in Kiribati but may not be available in the project sites. Another source of bulking agent is coconut husk fibers which are pulled out, so it is very loose. This option might create an additional burden on women who are likely to be the ones responsible for maintaining and cleaning the SCTs. A third option for the project sites is dry brown leaf litter which is often swept up during yard cleaning activities and may be both abundant and require little additional effort to collect. A bucket of brown leaf litter can last several weeks if properly applied.
4. If the SCT is designed with a urine separation facility which can either drain into plants or be collected in a container for use as a soil conditioner. Urine is sterile, not normally containing

<sup>4</sup> <http://www.unep.or.jp/ietc/Publications/TechPublications/TechPub-8d/kiribati1.asp>

<sup>5</sup> Bulking agent is a dry high carbon material (such as sawdust or leaf litter) which provides carbon to mix with the high nitrogen of human waste. This ensures that proper composting can take place.

<sup>6</sup> Compost Toilets and the Potential for use in the Pacific Islands, SPC, April 2017

pathogens, so it is safe to handle but often smells strong due to the ammonia in it and is not pleasant to have within a community.

Protective measures:

- Ensure the waste pile is some distance below the toilet seat and that little light is getting in so that it is hard to see into the toilet. The design should use a pedestal with a round hole at the lower end rather than a toilet seat placed onto a box.
- Treated wood shall be used to minimize risk of termite infestation.
- Consultations with the communities to discuss their preferred bulking agent and also raise awareness of the likely additional workload and importance of using this bulking agent. All consultations to be undertaken in such a way to ensure meaningful input by women.
- Consider providing the communities with wood chipper machines to assist with bulking agent and provide training on the use and maintenance of these machines.
- Banana circles planted close to the toilet to take the urine drain and process the leachate from the toilet is a very effective and sanitary solution
- The SCT designers should be required to use the SPC document 'Composting toilets and the potential for use in the Pacific Islands' as a guide for considerate design of SCTs at the project sites.

#### 6.1.1.4 *Use and Maintenance of Self Composting Toilets*

1. Maintenance of the SCT will often fall to women to undertake creating an additional burden on their workload.
2. All known pathogens (including Round Worm) will die outside the human body within 2 years in the Pacific Islands. Poor maintenance of SCTs will lead to pathogens remaining active in the mix. Poor maintenance of the SCT includes lack of bulking agent availability, lid not being kept closed and chamber not being emptied according to schedule.
3. Poor maintenance of SCTs will also lead to the toilets being abandoned due to lack of cleanliness and bad smells.
4. Not all SCTs are designed to house compost for 2 years in the chamber, therefore secondary processing in a separate container is required to make the compost sanitary and kill all pathogens. This requires the compost to be in a healthy state in the first instance before it is transferred, otherwise the secondary process will not be effective. The longer the compost remains in the toilet chamber the better, but it should be for at least 6 months to ensure that it is safe to handle (with sanitary precautions). The secondary processing site is vulnerable to run off, rodent access or public access (public health issues) if it is not contained in a secure manner.
5. The 2 year old compost can be used on tree crops. The compost should not be used directly on vegetable crops as there is a potential risk of food contamination if the compost has not been correctly processed.

Protective measures:

- Detailed training on the need for and correct method of SCT construction and maintenance should be given to both men and women. Separate consultations should be held with women to get their input and opinion on the likely success of the SCT maintenance given that this will likely fall to them. Equal gender representation is important during trainings to ensure that men feel responsibility towards this task and do not see it as a 'women's job'. An understanding of local traditions and customs is needed for this as discussion of sanitary

matters is often 'tapu' and can be difficult to get input. A local language speaker should lead these trainings and discussions rather than any international representatives.

- Maintenance and monitoring of the secondary processing container needs to be undertaken to ensure that it is meeting all necessary standards for correct processing. The party/organisation responsible for maintenance and monitoring should be identified prior to construction.
- Information posters should be installed in communities to ensure ongoing reminders of correct use and maintenance of SCTs.
- Provide training on when and where to use the compost. Training should include: no use on food crops around harvesting time to provide additional time for any remaining pathogens to die off, after compost has been spread cover it with mulch to avoid the possibility of the compost drying to dust and being carried by the wind, it is best to dig the compost into the ground, do not use on ground being prepared for vegetable crops, do not apply directly on vegetable crops, if compost is fully matured and older than 3 years then all pathogens will be dead and the compost will be safe to use for any kind of agriculture.
- Ensure equal opportunities to apply to work on the construction of the SCTs is given to women.

## 6.2 Coastal Defence Upgrades in Kosrae

The following potential significant impacts have been identified in relation to activities under this activity which provides for the upgrade and improvement of coastal defence upgrades at Paal and Mosral on Kosrae.

### 6.2.1 Environmental Impacts

The screening of potential environmental impacts was conducted in May 2016 during the preparation of the EIS for the Kosrae road construction. Assessment was conducted with KIRMA and DTI staff. Initial screening of the potential environmental impacts as conducted using the KIRM Regulations for Development Project – Initial Environmental Assessment Checklist. Potential significant impacts and protective measures are discussed below.

#### 6.2.1.1 Design of Revetment Works

1. Coastal defence works have the potential to cause downdrift erosion on adjacent shorelines at both Moral and Paal. At the southern end of the existing revetment at Paal the road curves inward with a wider coastal boulder protecting it. The shoreline position at this location is held by a small strand of reef flat mangroves. At Mosral, the current transition between the revetment and the beach is sharp which does not help to slow downward drift erosion. Kosrae has a standard for revetment design in the Kosrae Shoreline Management Plan which has been created to take account of re-using existing concrete rubble.
2. At the northern edge of the Mosral revetment works is a non-functional coastal outlet which has become damaged and over-washed creating standing water along the road side which floods upstream during heavy rain events. This damage has caused a loss of linkage in the design between the outflow and the revetment. It is likely that this outlet will need to be repaired as part of the road construction project which may result in the outlet design not complementing the revetment design and creating additional problems down current.

#### Protective Measures

- Design of revetment shall include input from DTI engineers to ensure best practices design of the transition between the defence and the beach to the south.

- The revetment at Paal will extend behind the existing shoreline at this point to ensure that outflanking and downdrift erosion does not occur.
- The revetment at Mosral at the southern end will be constructed at a shallower slope and armour rock used to construct a wider and flatter toe on the reef flat. This will ease the transition from defence to the beach and help prevent downdrift and outflanking effects.
- Design of the revetments will include design of repairing the outflow at Mosral to ensure effective linkage between the two pieces of infrastructure.

#### 6.2.1.2 Construction of Revetments

1. For both defence sections construction activities will take place from the edge of the road, over the beach that will underlie the revetment and on the immediate reef flats at the toe of the beach/defence. This has the potential to create an increased risk of sedimentation and erosion of the shoreline from the movement of heavy machinery.
2. Use of heavy machinery in the coastal environment brings with it the risk of fuel or oil spills into the marine environment.

#### Protective measures:

- The construction footprint on the reef flat will be minimised to no more than 10m in width from the toe of the beach/revetment and will not extend beyond the southern or northern extent of the proposed defence section.
- Access to the reef flat by the construction plant will be over the beach within the area of proposed defence reconstruction.
- At Paal additional care will be taken to ensure no heavy plant encroaches to or impacts on the root system of the mangrove strand that is located further seaward on the reef flat at the southern end of the proposed defence extent.
- Spill kits will be available on site during construction works and all staff members will be trained in their use.
- No refueling activities or storage of hazardous substances are permitted at the coastal construction site.

#### 6.2.1.3 Ground Exposure

Exposed areas during reconstruction of the defences are related to natural sand, gravel and coral rubble materials that comprises the beach and coastal berm. Stirring of this material due to wave action at high tide is a natural occurrence with the size of sand, gravel and coral material resulting in it quickly falling out of suspension. Removing the existing emergency revetment armour material and re-grading the underlying beach will result in some additional localised suspended sediment in the water column at high tide. If properly controlled, this is not anticipated to be significant, will not be above natural occurring limited, and will not impact on sensitive coastal ecosystems such as coral and mangrove areas.

#### Protective measures:

- No burning of ground cover for clearing shall be practiced.
- No vegetation should be removed from the shoreline berm beyond the southern extent of the proposed defences at Paal and Mosral.
- Stockpiles of beach sand, coral rubble or rock armour will not be located where material can be washed into a drain, stream or wetland area, including on a road pavement, on an overland flow path or within 15m of a stream bank, wetland or mangrove.
- All rock used in the construction of the defences will be volcanic in origin, come from licensed quarry sites, and will be clean and free from silt and other loose terrestrial material.

- A staged approach will be adapted to remove the existing armour layer, reprofiling the underlying beach, laying the geotextile filter layer and replacing the concrete slab/block and rock armour layer. This will ensure that there is a minimal length of beach exposed at any time reducing the potential for increased suspended sediments at high tide.
- Where stockpiling of sediment material is conducted on land or any land areas are cleared of vegetation, geotextile sediment fencing will be erected around all areas. The fence will be installed prior to stockpiling/clearing, as close to the contour of the site as possible, with the bottom edge of the fence buried to at least 150mm, and the fence posts installed on the downside of the fabric. The fences will be checked regularly and where sediment has built up, this will be removed.
- As soon as possible after the works are completed, rehabilitation of and exposed areas, such as the road verge will be undertaken.

#### *6.2.1.4 Control and disposal of wastes and hazardous materials*

There is the potential for pollution to be released into the marine and terrestrial environments during the construction works from activities using the heavy machinery, or from any washdown or laydown sites established for the works.

There is also the potential for pollution to be created by the improper management of solid waste generated by the works.

Protective Measures:

- All non-hazardous, non-recyclable waste will be placed in containers and regularly emptied and disposed of to a permitted landfill site.
- Lubricants and used oils will be stored in approved containers and promptly removed from site and disposed of as directed by KIRMA
- Care will be taken to prevent any releases or spills of fuel and lubricants during fueling and maintenance of construction equipment and will be prevented from entering the ground, drainage areas or water courses by using appropriate containers and bunds. No such activities will be undertaken within at least 15m of the coast.
- Any oily debris and contaminated soils will be recovered and disposed of as directed by KIRMA
- Adequate sanitary convenience that meets public health and environmental requirements will be provided for construction staff on site.
- On completion of the works, all surplus materials and construction debris shall be removed and recycled or disposed of in an appropriate manner.

## 6.2.2 Social Impacts

### *6.2.2.1 Haulage of Construction Materials*

Main haulage activities will involve transport of rock armour from the permitted quarry (possibly at Yeseng) to the sites at Paal and Mosral. This will not pass through built up residential areas but will pass a small number of residential properties potentially causing dust and noise nuisance as well as a safety risk to pedestrian vehicle traffic.

Protective Measures:

- Equipment and trucks passing through Malem village and other residential areas will slow to an appropriate speed to avoid noise and vibration disturbance as far as possible.

- Consultations will be undertaken with affected residents prior to commencement of works to advise of potential impacts and management measures.
- Construction vehicles using public and private roads will be clean with loads secured to prevent accidental spillage. Any accidental spillage of material transported on to roads beyond the immediate construction area will be promptly cleaned up.
- Establishment of machinery storage and washdown areas will be kept to a minimum and will be removed and the area reinstated and vegetated after construction. Any washdown areas shall be a minimum of 15m from any natural water course and washdown run off will not be discharged into natural waterways

### 6.3 Inland Road Relocation in Kosrae: Design phase

This activity carries the greatest environmental and social impact risk from the project. The following potential significant impacts have been identified in relation to activities under this output which provides for the inland realignment of the coastal road between Malem and Utwe on Kosrae.

The EIS for the road realignment contains details related to the potential environmental impact using the KIRMA Regulations for Development Project – Initial Environmental Impact Assessment checklist. Subsequent to this a 2019 Adaptation Fund safeguards assessment audit identified additional potentially significant impacts. Table 6 below is the updated KIRMA impact assessment table based on the 2019 audit findings (Y – yes, N – no, P – potentially). Parameters which are likely to be impacted by this activity are highlighted in the table.

Table 6: Kosrae EIA Regulations Impact Screening Table

Environmental Impacts – will the proposed project result in:		Y	N	P
1. Earth	a. Destruction, covering or modifications of any unique geological or biophysical feature		X	
	b. Contamination of soils or disturbance of previously or potentially contaminated soils?			X
	c. Creation of steep or other unstable land conditions?	X		
	d. Any potential for increased wind or water erosion (including in coastal areas) or soils, either on or off the site?	X		
	e. Changes in the channel of a stream, or the bed of the ocean or lagoon?			X
2. Air	a. Substantial air emissions, including greenhouse gas emissions, or deterioration of existing air quality?		X	
	b. Creation of objectionable odours?		X	
3. Water	a. Changes in currents, or the course or direction of water movement in either the marine or freshwaters?		X	
	b. Changes in absorption rates, drainage patterns, or the amount of surface run off?	X		
	c. Cause or exacerbate coastal, stream or river flooding or land drainage impacts?	X		
	d. Alterations to the course or flow of flood waters?	X		
	e. Discharge into surface waters or any alteration of surface water, water quality, including, but not limited to, temperature, dissolved oxygen, bacteria or turbidity?	X		
	f. Change in the quality or contamination of ground waters or wells, either through direct additional, withdrawal, seepage, or through interception of an aquifer by cuts or excavations?			X
4. Plant life	a. Destruction of any upland or mangrove forest communities?	X		
	b. Destruction of other important plant communities, such as sea grasses, or plants having potential commercial or medicinal value?		X	
	c. Destruction of or a reduction in the numbers of any unique, rare or endangered plant species?	X		
	d. Introduction of a new plant species into the area?		X	

	e. Result in a barrier to the normal replenishment or movement of existing plant species?		X	
	f. Increase in acreage of any agricultural crop?	X		
5. Animal life	a. Destruction or any coral reef areas?		X	
	b. Destruction of or reduction in the number of unique, rare or endangered animal species?		X	
	c. Introduction of new animal species into an area?		X	
	d. Result in a barrier to the migration or movement of animals through the environment?		X	
	e. Substantial deterioration in the quality of fish or wildlife habitat?			X
6. Alien invasive species	a. The potential introduction of alien invasive species			X
	b. The risk of spread or movement of an alien invasive species from an infested site to an un-infested site?	X		
7. Risk of Upset	a. A risk of an explosion or the release of hazardous substances, including, but not limited to oil, pesticides, chemicals or radiation, in the event of an accident or perturbed conditions?	X		
8. Climate change – will the proposed project be affected by:		Y	N	P
	a. Loss of land associated with ongoing, or storm or typhoon-related, shoreline change or coastal erosion?		X	
	b. Coastal flooding from high tides, large swells, storm or typhoon-related events?		X	
	c. Exposure of people or property to water related hazards such as flooding or tidal waves?		X	
	d. Extreme rainfall and associated flooding, including from rivers and streams, or water logging and drainage of low lying lands?	X		
	e. The effects of sea-level rise or other climate change influences of the hazards in (a) to (c)?		X	
Social impacts – will the proposed project result in		Y	N	P
9. Earth	a. Exposure of people and property to geological hazards such as landslides, ground failure or similar hazards?	X		
10. Water	a. Substantial reduction in the amount or quality of water otherwise available for public water supplies?		X	
11. Noise	a. Increase in existing noise levels or exposure of people to severe noise levels?	X		
12. Land use	a. Substantial alteration of the present or planned land use of an area?			X
	b. Incompatibility or conflict with adjacent land use(s)?		X	
13. Population	a. Relocation or altered distribution, density or growth rate of the human population of the area?	X		
14. Housing	a. Changes in existing housing or create a demand for additional housing?	X		
15. Transportation	a. Generation of substantial additional vehicular movement?		X	
	b. Substantial impact on roads and existing transportation system?	X		
	c. Alteration to present patterns or movement of people and/or goods?	X		
16. Human health	a. Creation of any health hazard or potential health hazards?		X	
	b. Improvement in human health?		X	
17. Aesthetics	a. Obstruction of our deterioration of any scenic vista?		X	
18. Recreation	a. Changes in the quality or amount of existing recreational opportunities, including those recommended sites for nature-based tourism?	X		
19. Cultural resources	a. Alteration or destruction of archeological sites?			X
	b. Adverse physical or aesthetic effects to a historic resource?			X
	c. Potential to cause a physical change that would affect unique cultural values?		X	
	d. Restriction of existing religious or sacred uses within the affected area?		X	
Economic impact – will the proposed project result in		Y	N	P
20. Natural resources	a. A noticeable increase in the rate of use of any natural resource?	X		
	b. Substantial depletion of any non-renewable natural resources?			X
21. Public services – will the proposed project affect or result in the need for new or altered services in the following areas?		Y	N	P
	a. Police or fire protection?		X	
	b. Schools?		X	
	c. Parks or other recreational facilities?		X	

	d. Hospital?		X	
	e. Other government services?		X	
22. Utilities – will the proposed project result in the need for new systems or substantial changes in the following?		Y	N	P
	a. Power	X		
	b. Communications?	X		
	c. Water?		X	
	d. Sewage disposal?		X	
	e. Solid waste disposal?		X	

Potential significant environmental and social impacts from this table are discussed below in relation to the impact generating activity and protective measures are also provided.

### 6.3.1 Environmental Impacts

#### 6.3.1.1 Design of road and drainage

1. The road alignment was identified in 2016 but the detailed design has not yet been completed. The majority of the Malem to Utwe road will run along or close to the 10m contour up to the end of the inland farm road at Kuplu.

The inland road will also cross a number of perennial and intermittent streams that drain the upper catchments into freshwater swamp/mangrove areas and rivers all leading into the marine environment.

Furthermore, increases in sea level and rainfall affects drainage of low-lying swamp and farmland areas behind the coastal berm leading to an increased frequency of waterlogging and flooding of land and potentially increased frequency of drainage and stream outlet blockage at the coast. Increasing the surface area of the inland road through construction of the new sections will increase the amount of rainfall run off into the lower lying areas. If the design of any drainage (including swales, ditches, and cross drains/culverts) does not take into account the downstream impact of the additional rainfall runoff then the flooding impacts will increase.

Drainage also needs to take into account that outfall cannot be onto privately owned land as this would degrade the land and potentially cause flooding.

Protective measures:

- Bridge and culvert design should be based on the most recent extreme rainfall intensity amount available for Kosrae (ADB, 2005) (shown in section 4.3 of the Environmental Impact Statement) using 2025 as the “present day” scenario and the design accommodate rainfall intensities to the 2050 projections.
- Bridges and culverts are designed to accommodate a 25 year return period flow. This is higher than the 10 year return period specified in the design guidance, however a 25 year return period would make allowances for the uncertainties in climate predictions and surprises in rainfall response to climate change.
- The road design standards include specifications for bridge and culvert wing walls to avoid bank erosion immediately upstream/downstream of each structure.
- Where necessary rock mattresses or equivalent should be installed to prevent any erosion of either the upstream or downstream water course. If exit velocities from any of the culverts

or bridges are likely to be significantly increased above normal, energy dissipation measures should also be included to minimise downstream erosion.

- Ensuring no outflow from drainage expels onto private lands.
- Align the road to minimise the long sloping sections, where necessary having shorter steep sections interspersed with flatter sections that follow the topographical contours.
- Having in- or out-sloping road surfaces to encourage greater lateral flow.
- Intercepting longitudinal water movements with dips or cross drains.
- Slowing drainage flows in the swales or drains at the side of the road to prevent erosion of the drainage channel, through for example construction of regular check dams along sloping sections of the road. These are typically made out of graded rock, with other material such as sandbags able to be used as a temporary measure until the rock check dams are installed.

#### *6.3.1.2 Identification of Laydown Sites*

Multiple laydown or stockpiling sites will likely be required for these works. Sites will be used to store hazardous substances; stockpile aggregates, excavated soils or other materials; washdown machinery; mix concrete, etc. Environmental degradation can occur if these sites are located close to or within the run-off path of waterways or the marine environment.

Protective Measures:

- All stockpile or laydown sites will be located a minimum of 15m from any natural water course and at least 30m from the coastline.
- Laydown sites will be kept to a minimum and the areas will be reinstated and revegetated on completion of works.
- Laydown and stockpile sites should be on government land where possible. For any sites on private land, the owners should be fully consulted and will sign an agreement for temporary use of the land.

#### *6.3.1.3 Clearing of Native Upland Forest*

Between Kuplu and Finsrem approximately 1.15 miles of proposed new road will pass through a section of upland forest both above and below the Japanese line (Figure 14). In order to build the road, the forest will need to be cleared along the alignment and up a maximum width of 60ft.



Figure 16: Special consideration districts. Source: Kosrae State Land Use Plan (Kosrae State, 2003)

The upland forest (Figure 16) is undisturbed and provides a good example of tropical oceanic island rain forest where species diversity is high. In Kuplu Wan the forest is dominated by tall *Horsfieldia* (Nunu), Fale Sandlewood (Mwetkwem), *Elaeocarpus carolinensis* (Nahnek), Banyan tree (Kohnyah), Strangler Fig (Shrah), Neubergia (Tohoh) and thickets of Hibiscus (Lo) and *Parinari laurina* (Ahset).<sup>7</sup> Tree ferns, lianas, vines and terrestrial ferns characterize the mid and ground levels. Minimal agroforestry occurs currently within the interior of Kuplu Wan but there has been greater use historically, including during the Japanese period.

Clearing of this tract of forest will remove several large mature tree specimens, some of which (such as the Banyan) are considered to be culturally important as well as biologically significant. The loss of this area of upland forest will be permanent but will be limited in geographic scope to the road easement corridor.

Protective measures:

- Only the road alignment corridor can be cleared of mature tree specimen. Minor coppicing work can be undertaken surrounding the corridor if needed, however no mature tree specimens will be removed outside of this corridor.

<sup>7</sup> Kosrae State Land Use Plan, Kosrae State, 2003

- Road alignment will be routed to avoid any stands of mature trees which provide important ecosystem services such as soil stabilization.
- No laydown site(s) or stockpile site(s) will be located along the 1.15 mile stretch of new road between Kuplu and Finsrem.

#### 6.3.1.4 Earthworks

1. The most significant impacts related to the construction activities related to potential excessive runoff of soils and silt and soil erosion of cleared or exposed soils from earthworks. The inland road between Malem and Kuplu mostly follows the 10m contour and this was aligned, as far as possible, located on soils with lower erosion potential and to follow the natural topographic contour which helps reduce potential erosion.

The steep sections between Kuplu and Finsrem will be prone to erosion, particularly during rain events which are frequent on Kosrae.

The downstream environments are adapted to a certain amount of natural soil and silt run off. Despite the relatively natural state of the catchments, stream turbidity can increase substantially during periods of intense rain. Measurements in streams leading to the Lelu water supply in Tofol indicated variations in turbidity from < 10 NTU to > 250NTU over short periods of time following rainstorms.<sup>8</sup> Drinking water is generally less than 5 NTU and highly murky water is > 200NTU. These storm events are generally short in duration with streams reverting to typical flows and low turbidity and do not appear to have significant impact on stream biota or downstream ecosystems. During construction works there is significant potential for increased turbidity from sediment laden run off which could have longer term impacts on the ecosystem health.

2. Earthworks on the slopes of the Kuplu Finsrem plateau as well as earthworks which will create wider sections on road by cutting or filling along any of the road sections have the potential to create steep or unstable land areas which could create landslides. Landslides primarily occur when heavy rains destabilise soil on steep slopes, causing them to crumble.
3. Along the inland road from Malem to Kuplu, there is a notable presence of the creeper vine *Merremia peltate* which is highly invasive and smothers its host plants creating a monoculture which displaces native plant species. From Kuplu to Finsrem, through the new road area the invasive vine isn't present to any significant level (Figure 17). Clearing the forest in this area and undertaking significant earthworks will create the ideal conditions for this vine species to invade the upland forest eventually resulting in a loss of biodiversity along the new section of road. While it is likely that this introduction cannot be avoided, Figure 17 demonstrates that along other sections of the inland road the spread of the vine is relatively contained to the disturbed areas and, as long as the upland forest habitat remains undisturbed outside the road corridor then the geographic scale of the vine will be limited.

---

<sup>8</sup> Kosrae Inland Road Realignment Environmental Impact Statement, 2016

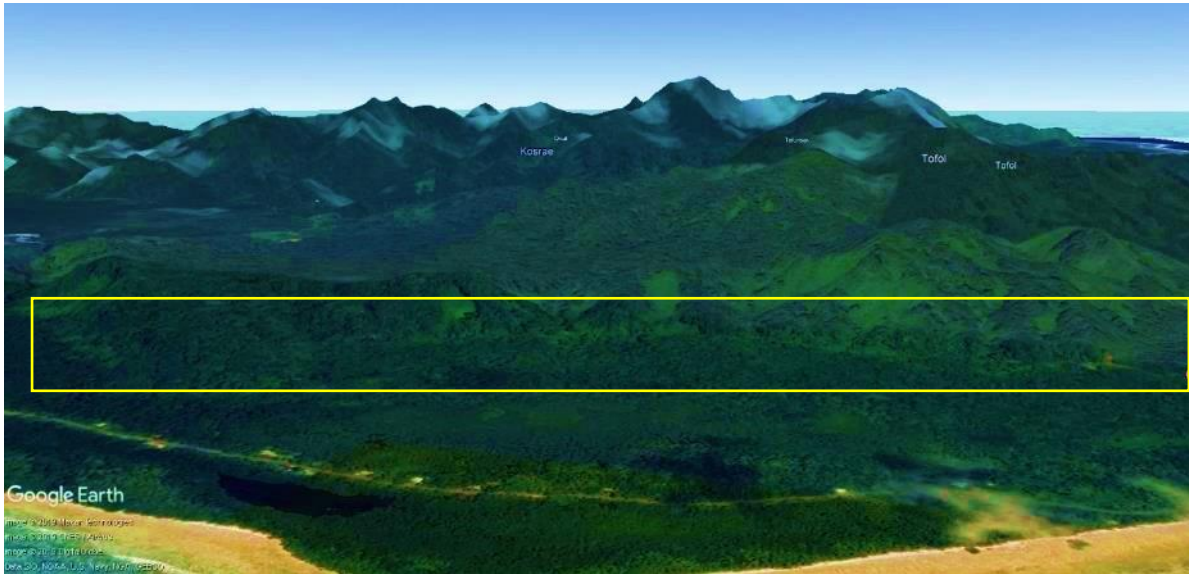


Figure 17: 3D Google Earth view of existing inland road sections between Yeseng and Finsrem (yellow bounding box). Colours edited to show changes in vegetation make up along existing road and upland forest where no road and therefore no altered vegetation exists.

#### Protective Measures:

- All excavated slopes should be designed and constructed to be resistant to landslides through erosion control techniques, geotextiles, soils and hydrological data.
- Only remove trees and plants which are absolutely necessary between Kuplu and Finsrem.
- Land clearance and excavation should be clearly defined and the footprint minimised to as great an extent as possible.
- Excavated soils will be stockpiled on KIRMA and DTI approved sites and will be controlled to ensure no material can runoff into waterways or the coastal environment.

### 6.3.2 Social Impacts

#### 6.3.2.1 Alignment through residential property

All easements will be entered into on a voluntary basis and each landowner has the right to refuse donation. There will be instances where the proposed alignment cuts through landowners property and potentially disrupts the use of their residential site and may result in objections from that landowner.

#### Protective Measures:

- For any disputes over alignment through residential areas, the primary method of settling this would be through avoidance of the disputed area and a small realignment of the road to a more acceptable route.

#### 6.3.2.2 Cultural Heritage

The locations of known historical and culturally important sites are shown in **Error! Reference source not found.**. The majority are military installations from the Japanese era with prehistoric sites

at Lele and Kuplu/Mosral. Since these sites were identified during the development of the EIS, a new site which was thought to be one of the original inland settlements has also been identified in the upland forest above Kuplu. This site has been added to the figure below (blue dot) and the road alignment doesn't go through the site, although it passes very close to it.

A survey of the known sites is detailed in the EIS however, it is possible that at any stage of construction works new items of cultural importance or archeological artifacts can be revealed.

Damage to known sites and new sites uncovered during construction is possible when working with heavy construction machinery. Once damaged or lost, these sites cannot be replaced and they must be protected from any damage.

## 7 Environmental and Social Management Plans

### 7.1 Introduction

Sections 7.2, 7.3 and 7.4 below contain the required management plans for the physical investments under component 2 and 3 as well as the associated Monitoring Plan for each of the physical investment areas. The management plans include measures to satisfy both National and State regulations as well as the Adaption Fund (and SPREPs) safeguard policies. They describe details of the mitigation measures required, the responsible entity and the applicable project phase.

Monitoring Plans are also provided for each physical investment type. These plans include items which require a one-off check prior to commencement of works and also parameters which need to be monitored weekly to ensure ongoing compliance during construction phase. Where appropriate, there are also recommended monitoring requirements for the operational phase of the works, however these will be the responsibility of the relevant authority to include in their own maintenance arrangements after project completion.

Section 7.6 provides the project team for a guide to site selection for water security investments, particular the sites for well upgrades and installations of SCTs. These tend to be 'rules of thumbs' and will need to applied in the context of each village.

Section 7.7 provides some higher-level guidance to the EE and IE on how to ensure environmental and social safeguards are implemented into the technical advisory activities. This ensures that all contracts, TORs, policies, plans, frameworks, etc developed under this project are screened to ensure that the development process and the recommendations follow the principles of the Adaptation Fund.

## 7.2 Management Plan for Water Security Measures

### 7.2.1 Environmental and Social Management Plan

Activity	Significant Potential Impacts	Mitigation Measures	Location	Timing/ Duration	Who Implements	Who Supervises
<b>1 Design/Pre-Construction Phase – Water Security Measures</b>						
Site Selection for Investments	Access to communal water supply compromise if investment is installed on private land without full landowner cooperation.	<ul style="list-style-type: none"> <li>Avoid installation or upgrades of any community water supply on private land.</li> <li>If private land is needed, easements signed and submitted with any private land owners prior to the commencement of any works. Easement should include provisions to manage or relinquish the land within a 30m circle around the well head to minimise the risk of contamination.</li> <li>No compulsory land acquisition will be used for any investment.</li> </ul>	Yap, Chuuk, Pohnpei	Prior to design of interventions	Project Unit	DECEM
	Water quality comprised from any community ground water sources on private land through poor land use management around well head.	<ul style="list-style-type: none"> <li>Sign easement with landowner to prevent use of land for any contaminate generating activities within 30m radius of well head and to permit access by public health or other relevant officers to conduct water quality testing.</li> <li>Otherwise, Consultations with the landowners to be documented to demonstrate that any landowners have been made aware of the land use restrictions around any community ground water supply on their land.</li> </ul>	Yap, Chuuk, Pohnpei	Prior to design of interventions	Project Unit	DECEM
Design of Self Composting Toilets	SCT design allows too much light into toilet chamber causing to user to see other human waste leading to overuse of bulking agent and/or abandonment of SCT.	<ul style="list-style-type: none"> <li>Ensure the waste pile is some distance below the toilet seat and that little light is getting in so that it is hard to see into the toilet. The design should use a pedestal with a round hole at the lower end rather than a toilet seat placed onto a box.</li> </ul>	Yap, Chuuk, Pohnpei	During design	Designers	Project Unit

Activity	Significant Potential Impacts	Mitigation Measures	Location	Timing/ Duration	Who Implements	Who Supervises
		<ul style="list-style-type: none"> <li>Treated wood shall be used to minimize risk of termite infestation.</li> <li>The SCT designers are required to use the SPC document 'Composting toilets and the potential for use in the Pacific Islands' as a guide for considerate design of SCTs at the project sites (Annex 3).</li> <li>Ensure good ventilation to minimize odours.</li> <li>Access for people with mobility issues and the elderly will be considered in the design process to ensure ease of access.</li> </ul>				
	Lack of readily accessible and easily gathered bulking agent leading to disrupted composting process, foul odours, additional burden on women to gather some types of bulking agent and/or abandonment of composting toilets	<ul style="list-style-type: none"> <li>Consultations with the communities to discuss their preferred bulking agent and also raise awareness of the likely additional workload and importance of using this bulking agent. All consultations to be undertaken in such a way to ensure meaningful input by women.</li> <li>The SCT designers are required to use the SPC document 'Composting toilets and the potential for use in the Pacific Islands' as a guide for considerate design of SCTs at the project sites (Annex 3).</li> </ul>	Yap, Chuuk, Pohnpei	During design	Designers	Project Unit
	Urine separation facility can lead to foul smelling odour from soils receiving output waste	<ul style="list-style-type: none"> <li>Banana circles planted close to the toilet to take the urine drain and process the leachate from the toilet is a very effective and sanitary solution</li> <li>The SCT designers should be required to use the SPC document 'Composting toilets and the potential for use in the Pacific Islands' as a guide for considerate design of SCTs at the project sites (Annex 3).</li> </ul>	Yap, Chuuk, Pohnpei	During Design	Designer & Community	Project Unit
Design of water extraction from wells	Contamination of water scoop/bucket from ground around well head for manual extraction	<ul style="list-style-type: none"> <li>Use the Kiribati designed 'Tamana' pump to extract water. This pump required no electrical motor and is built from various sizes and lengths of PVC piping. This design is widely used throughout Kiribati to extract</li> </ul>	Yap, Chuuk, Pohnpei	During Design	Designer	Project Unit

Activity	Significant Potential Impacts	Mitigation Measures	Location	Timing/ Duration	Who Implements	Who Supervises
	<p>leading to contamination of collected water and ground water.</p> <p>For mechanical extraction, risk of failure of electrical (including solar) pumps</p>	<p>water with a great degree of success. The Tamana Pump's basic components are 25mm PVC pip, usually up to 30m long; a 50mm PVC pipe, 1m long; 1 25mm to 50mm, 45o PVC reducer bend; a 25mm elbow; a 25mm PVC male adaptor; a foot valve; and, a piston made of one-half in PVC piping.</p> <ul style="list-style-type: none"> <li>• No electrical pumps to be installed under this project.</li> <li>• Project will support activities to upgrade structure of the wells walls and cover the well heads to provide safe, easy access to the water via the Tamana pump.</li> </ul>				
<b>Construction Phase – Water Security Intervention</b>						
Solid waste production during construction	Overburden on existing waste management practices	<ul style="list-style-type: none"> <li>• All solid waste will be securely stored at construction laydown site until disposal.</li> <li>• Solid waste which cannot be reused, recycled, composted or otherwise utilised by the community will be removed from the island and disposed of at a permitted landfill on the main island of that state.</li> </ul>	Yap, Chuuk, Pohnpei	Throughout construction	Contractor	Project Unit
Operation of laydown site	Environmental risks to ground water, coastal water and soil from poorly planned and managed construction staging and laydown site	<ul style="list-style-type: none"> <li>• Laydown areas will be sited on public or government owned land.</li> <li>• Areas will be securely fenced.</li> <li>• Bunded and covered areas will be installed for the storage and handling of hazardous materials and/or substances, the wash down of machinery and the preparation of concrete.</li> <li>• Run off from these bunded areas will be collected, treated and tested before being either reused for construction purposes or allowed to discharge into the ground, away from the marine environment. Discharge will</li> </ul>	Yap, Chuuk, Pohnpei	Throughout construction	Contractor	Project Unit

Activity	Significant Potential Impacts	Mitigation Measures	Location	Timing/ Duration	Who Implements	Who Supervises
		be at a rate to allow absorption without causing surface flooding <ul style="list-style-type: none"> <li>• Segregated storage for solid waste will be provided. This area will be clearly marked and designed to ensure that as waste is secure.</li> <li>• Water conservation measures will be implemented and workers trained on this.</li> <li>• Regular inspection of machinery to ensure it is in good working order.</li> </ul>				
Concrete production for foundation pads or well heads	Ground water pollution	<ul style="list-style-type: none"> <li>• Concrete will be prepared on bunded and covered hard stand surface of laydown areas.</li> <li>• All waste water from concrete production will be collected and treated to lower the pH and allow particulates to settle out before being recycled for construction purposes.</li> <li>• Slurry from concrete production will be collected and treated. Treatment can vary depending on viscosity of slurry but can include the same measures described for treating concrete waste water, or can be by facilitating the solidification of the slurry to form a gel which can be stored and disposed of according to the Solid Waste Management Plan.</li> <li>• Solid and cured concrete waste is considered safe to be reused by the community for infrastructure maintenance.</li> <li>• The Contractor's will have a spill response plan in place to manage accidental spills or leakages of concrete waste water or slurry.</li> </ul>	Yap, Chuuk, Pohnpei	Throughout construction	Contractor	Project Unit
Construction within village	Community health and safety risks from construction activities	<ul style="list-style-type: none"> <li>• Community consultations carried out as per this ESMP.</li> <li>• Post signs on the laydown sites advising community member to keep out.</li> <li>• Install secure fencing around laydown sites.</li> </ul>	Yap, Chuuk, Pohnpei	Prior to commencement of works and throughout works	Contractor	Project Unit

Activity	Significant Potential Impacts	Mitigation Measures	Location	Timing/ Duration	Who Implements	Who Supervises
		<ul style="list-style-type: none"> <li>Construction work will only be carried out during normal business hours.</li> <li>Assign personnel to manage traffic movement and safety as required.</li> </ul>				
<b>Operation Phase – Water Security Interventions</b>						
Use and Maintenance of Self Composting Toilets	Unfair additional burden on women for SCT maintenance	<ul style="list-style-type: none"> <li>Detailed training on the need for and correct method of SCT maintenance should be given to both men and women. Separate consultations should be held with women to get their input and opinion on the likely success of the SCT maintenance given that this will likely fall to them. Equal gender representation is important during trainings to ensure that men feel responsibility towards this task and do not see it as a ‘women’s job’. An understanding of local traditions and customs is needed for this as discussion of sanitary matters is often ‘tapu’ and can be difficult to get input. A local language speaker should lead these trainings and discussions rather than any international representatives.</li> <li>Identification of the party responsible for maintenance and monitoring of the SCT should be identified before construction commences.</li> </ul>	Yap, Chuuk, Pohnpei	Ongoing	Village Councils	DECEM

Activity	Significant Potential Impacts	Mitigation Measures	Location	Timing/ Duration	Who Implements	Who Supervises
	Poor maintenance of SCTs will lead to pathogens remaining active in the compost mix.	<ul style="list-style-type: none"> <li>• Training materials to be developed in local language to cover the key areas of maintenance – lack of available bulking agent, lid not being kept closed, chamber not being emptied according to designers schedule.</li> <li>• Detailed training on the need for and correct method of SCT maintenance should be given to both men and women.</li> <li>• Information posters should be installed in communities to ensure ongoing reminders of correct use and maintenance of SCTs.</li> </ul>	Yap, Chuuk, Pohnpei	Prior to hand over of SCT	Project Unit	DECEM
	Contaminated run-off, rodent infiltration or public access risks to poorly managed secondary containment units	<ul style="list-style-type: none"> <li>• Maintenance and monitoring of the secondary processing container needs to be undertaken to ensure that it is meeting all necessary standards for correct processing.</li> </ul>	Yap, Chuuk, Pohnpei	Ongoing	Village Councils	DECEM
	Possible crop contamination from improper use of mature compost	<ul style="list-style-type: none"> <li>• Provide training on when and where to use the compost. Training should include: no use on food crops around harvesting time to provide additional time for any remaining pathogens to die off, after compost has been spread cover it with mulch to avoid the possibility of the compost drying to dust and being carried by the wind, it is best to dig the compost into the ground, do not use on ground being prepared for vegetable crops, do not apply directly on vegetable crops, if compost is fully matured and older than 3 years then all pathogens will be dead and the compost will be safe to use for any kind of agriculture.</li> </ul>	Yap, Chuuk, Pohnpei	Prior to hand over of SCT	Project Unit	DECEM
Maintenance of water harvesting systems	Contamination of harvested water from dirty guttering and/or mosquito infiltration of storage tank	<ul style="list-style-type: none"> <li>• Training materials to be developed in local language to cover the key areas of maintenance – period clearing or gutters, maintenance of any mosquito screens, basic water quality testing, etc.</li> </ul>	Yap, Chuuk, Pohnpei	Prior to hand over of SCT	Project Unit	DECEM

Activity	Significant Potential Impacts	Mitigation Measures	Location	Timing/ Duration	Who Implements	Who Supervises
		<ul style="list-style-type: none"> <li>• Detailed training on the need for and correct method of maintenance and water quality testing should be given to both men and women.</li> <li>• Information posters should be installed in communities to ensure ongoing reminders of correct use and maintenance.</li> </ul>				

### 7.2.2 Monitoring Plan for Water Security Interventions

Activity	Mitigation Measures	Monitoring / Frequency	When	Who will monitor	Supervision
<b>1 Design/Pre-Construction Phase – Water Security Measures</b>					
Site Selection for Investments	<ul style="list-style-type: none"> <li>Avoid installation or upgrades of any community water supply on private land.</li> <li>If private land is needed, easements signed and submitted with any private land owners prior to the commencement of any works. Easement should include provisions to manage or relinquish the land within a 30m circle around the well head to minimise the risk of contamination.</li> <li>No compulsory land acquisition will be used for any investment.</li> </ul>	One off: Signed voluntary donation easement sighted for any installations on private land. Easement to include 30m diameter from well head and provisions for land use management.	Prior to finalization of site selection	DECEM	SPREP
Design of Self Composting Toilets	<ul style="list-style-type: none"> <li>Ensure the waste pile is some distance below the toilet seat and that little light is getting in so that it is hard to see into the toilet. The design should use a pedestal with a round hole at the lower end rather than a toilet seat placed onto a box.</li> <li>The SCT designers are required to use the SPC document 'Composting toilets and the potential for use in the Pacific Islands' as a guide for considerate design of SCTs at the project sites (Annex 3).</li> </ul>	One off: Design of SCT to ensure it meets these standards	Prior to approval of design	DECEM	SPREP
	<ul style="list-style-type: none"> <li>Consultations with the communities to discuss their preferred bulking agent and also raise awareness of the likely additional workload and importance of using this bulking agent. All consultations to be undertaken in such a way to ensure meaningful input by women.</li> <li>The SCT designers are required to use the SPC document 'Composting toilets and the potential for use in the Pacific Islands' as a guide for considerate design of SCTs at the project sites (Annex 3).</li> </ul>	One off: Evidence that bulking agent has been selected based on community consultation	Prior to approval of design	DECEM	SPREP
	<ul style="list-style-type: none"> <li>Banana circles planted close to the toilet to take the urine drain and process the leachate from the toilet is a very effective and sanitary solution</li> <li>The SCT designers should be required to use the SPC document 'Composting toilets and the potential for use in the Pacific Islands' as a guide for considerate design of SCTs at the project sites.</li> </ul>	One off: design incorporates banana circle and evidence that this has been consulted with the community	Prior to approval of design	DECEM	SPREP

Activity	Mitigation Measures	Monitoring / Frequency	When	Who will monitor	Supervision
Design of water extraction from wells	<ul style="list-style-type: none"> <li>Use the Kiribati designed 'Tamana' pump to extract water. This pump required no electrical motor and is built from various sizes and lengths of PVC piping. This design is widely used throughout Kiribati to extract water with a great degree of success. The Tamana Pump's basic components are 25mm PVC pip, usually up to 30m long; a 50mm PVC pipe, 1m long; 1 25mm to 50mm, 45o PVC reducer bend; a 25mm elbow; a 25mm PVC male adaptor; a foot valve; and, a piston made of one-half in PVC piping</li> </ul>	One off: design incorporates Tamana pump for all upgraded well heads	Prior to approval of final design	DECEM	SPREP
<b>Construction Phase – Water Security Measures</b>					
Solid waste production during construction	<ul style="list-style-type: none"> <li>All solid waste will be securely stored at construction laydown site until disposal.</li> <li>Solid waste which cannot be reused, recycled, composted or otherwise utilised by the community will be removed from the island and disposed of at a permitted landfill on the main island of that state.</li> </ul>	Weekly: Waste collection at laydown area is secure, well signed and clean.  Good housekeeping around project sites.  Waste is being removed to a KIRMA approved disposal site.	For duration of works	Project Unit	DECEM
Operation of laydown site	<ul style="list-style-type: none"> <li>Laydown areas will be sited on public or government owned land.</li> <li>Areas will be securely fenced.</li> <li>Bunded and covered areas will be installed for the storage and handling of hazardous materials and/or substances, the wash down of machinery and the preparation of concrete.</li> <li>Run off from these bunded areas will be collected, treated and tested before being either reused for construction purposes or allowed to discharge into</li> </ul>	One off: All mitigation measures are in place	Prior to commencement of works	Project Unit	DECEM

Activity	Mitigation Measures	Monitoring / Frequency	When	Who will monitor	Supervision
	the ground, away from the marine environment. Discharge will be at a rate to allow absorption without causing surface flooding <ul style="list-style-type: none"> <li>Segregated storage for solid waste will be provided. This area will be clearly marked and designed to ensure that as waste is secure.</li> <li>Water conservation measures will be implemented and workers trained on this.</li> <li>Regular inspection of machinery to ensure it is in good working order.</li> </ul>	Weekly: all mitigation measures are in place and functional as per ESMP.	For duration of works.	Project Unit	DECCEM
Concrete production for foundation pads or well heads	<ul style="list-style-type: none"> <li>Concrete will be prepared on bunded and covered hard stand surface of laydown areas.</li> <li>All waste water from concrete production will be collected and treated to lower the pH and allow particulates to settle out before being recycled for construction purposes.</li> <li>Slurry from concrete production will be collected and treated. Treatment can vary depending on viscosity of slurry but can include the same measures described for treating concrete waste water, or can be by facilitating the solidification of the slurry to form a gel which can be stored and disposed of according to the Solid Waste Management Plan.</li> <li>Solid and cured concrete waste is considered safe to be reused by the community for infrastructure maintenance.</li> <li>The Contractor's will have a spill response plan in place to manage accidental spills or leakages of concrete waste water or slurry.</li> </ul>	One off: all mitigation provisions are in place	Prior to commencement of concrete production	Project Unit	DECCEM
		Weekly: concrete production is occurring at designated area, water catchment and treatment systems are functional	During concrete production works	Project Unit	DECCEM
Construction within village	<ul style="list-style-type: none"> <li>Community consultations carried out as per this ESMP.</li> <li>Post signs on the laydown sites advising community member to keep out.</li> <li>Install secure fencing around laydown sites.</li> <li>Construction work will only be carried out during normal business hours.</li> </ul>	One off: fences are in place, signs are in place and community has been consulted.	Prior to commencement of works	Project Unit	DECCEM
		Weekly: mitigation measures are being implemented as required in ESMP	Duration of works	Project Unit	DECCEM

Activity	Mitigation Measures	Monitoring / Frequency	When	Who will monitor	Supervision
	<ul style="list-style-type: none"> <li>Ensure equal opportunities to apply to work on the construction of the SCTs is given to women.</li> <li>Assign personnel to manage traffic movement and safety as required.</li> </ul>				
<b>Operational Phase</b>					
Use and Maintenance of Self Composting Toilets	<ul style="list-style-type: none"> <li>Detailed training on the need for and correct method of SCT maintenance should be given to both men and women. Separate consultations should be held with women to get their input and opinion on the likely success of the SCT maintenance given that this will likely fall to them. Equal gender representation is important during trainings to ensure that men feel responsibility towards this task and do not see it as a 'women's job'. An understanding of local traditions and customs is needed for this as discussion of sanitary matters is often 'tapu' and can be difficult to get input. A local language speaker should lead these trainings and discussions rather than any international representatives.</li> </ul>	One off: evidence that training and consultation has occurred as required.	Prior to hand over of SCT	DECEM	SPREP
	<ul style="list-style-type: none"> <li>Training materials to be developed in local language to cover the key areas of maintenance – lack of available bulking agent, lid not being kept closed, chamber not being emptied according to designers schedule.</li> <li>Detailed training on the need for and correct method of SCT maintenance should be given to both men and women.</li> <li>Information posters should be installed in communities to ensure ongoing reminders of correct use and maintenance of SCTs.</li> </ul>	One off: training materials produced, training undertaken and posters in place	Prior to hand over of SCP	DECEM	SPREP
	<ul style="list-style-type: none"> <li>Maintenance and monitoring of the secondary processing container needs to be undertaken to ensure that it is meeting all necessary standards for correct processing.</li> </ul>	Monthly: secondary containment is leak free and well maintained	For life of SCT	Village Council	DECEM

Activity	Mitigation Measures	Monitoring / Frequency	When	Who will monitor	Supervision
	<ul style="list-style-type: none"> <li>Provide training on when and where to use the compost. Training should include: no use on food crops around harvesting time to provide additional time for any remaining pathogens to die off, after compost has been spread cover it with mulch to avoid the possibility of the compost drying to dust and being carried by the wind, it is best to dig the compost into the ground, do not use on ground being prepared for vegetable crops, do not apply directly on vegetable crops, if compost is fully matured and older than 3 years then all pathogens will be dead and the compost will be safe to use for any kind of agriculture.</li> </ul>	One off: Training provided and attended by all relevant stakeholders	Prior to hand over of SCT	DECEM	SPREP
Maintenance of water harvesting systems	<ul style="list-style-type: none"> <li>Training materials to be developed in local language to cover the key areas of maintenance – period clearing or gutters, maintenance of any mosquito screens, etc.</li> <li>Detailed training on the need for and correct method of maintenance should be given to both men and women.</li> <li>Information posters should be installed in communities to ensure ongoing reminders of correct use and maintenance.</li> </ul>	Periodic: all elements of water harvesting system are cleaned and functional	Ongoing	Village Council	DECEM

### 7.3 Management Plan for Kosrae Coastal Defence Upgrades

#### 7.3.1 Environmental and Social Management Plan

Activity	Significant Potential Impacts	Mitigation Measures	Location	Timing/ Duration	Who Implements	Who Supervises
<b>Pre-Construction Phase – Kosrae Coastal Defence Upgrades</b>						
<b>General Impacts</b>						
Safeguard Integration	No safeguard requirements being adhered to or considered during the design process	<ul style="list-style-type: none"> <li>The ESMP shall be included in the TORs or works agreements.</li> </ul>	Paal and Mosral	Prior to finalization of design	Project Unit	DECEM
	No safeguard requirements being captured within the works agreement with the PIU	<ul style="list-style-type: none"> <li>Include key mitigation measures from ESMP within the works agreement, particularly the detailed roles as described in Section 8.</li> </ul>	Paal and Mosral	Prior to finalization of design	Project Unit	DECEM
	No safeguard requirements being contractually applicable to the Contractor during project implementation	<ul style="list-style-type: none"> <li>The ESMP will be included in the contractors specification and contract.</li> <li>Specific mitigation measures for the contractor / supplier shall be highlighted in the general conditions.</li> </ul>	Paal and Mosral	During development of contract	Project Unit	SPREP
	National safeguard legislation not adhered to during project implementation	<ul style="list-style-type: none"> <li>Obtain Development Consent from KIRMA based on the Kosrae EIA Regulations and using this ESMP to inform the application.</li> </ul>	Paal and Mosral	Prior to commencement of works	Project Unit	KIRMA
<b>Environmental Impacts</b>						
Design of Revetment Works	Downdrift erosion on adjacent shorelines at Paal and Mosral	<ul style="list-style-type: none"> <li>Design of revetment shall include input from DTI engineers to ensure best practices design of the transition between the defence and the beach to the south.</li> <li>The revetment at Paal will extend behind the existing shoreline at this point to ensure that outflanking and downdrift erosion does not occur.</li> <li>The revetment at Mosral at the southern end will be constructed at a shallower slope and armour rock used to construct a wider and</li> </ul>	Paal and Mosral	During design	DTI	Project Unit

Activity	Significant Potential Impacts	Mitigation Measures	Location	Timing/ Duration	Who Implements	Who Supervises
		flatter toe on the reef flat. This will ease the transition from defence to the beach and help prevent downdrift and outflanking effects.				
	Impaired functioning of revetment works from damaged coastal outlet at Mosral leading to increased risk of flooding behind or undermining of revetment.	<ul style="list-style-type: none"> <li>Design of the revetments will include design of repairing the outflow at Mosral to ensure effective linkage between the two pieces of infrastructure.</li> </ul>	Mosral	During design	DTI	Project Unit
<b>Social Impacts</b>						
Design of Revetment	Lack of community support for the design	<ul style="list-style-type: none"> <li>Ensure all key community stakeholders are included in the consultations for the final revetment design to ensure local knowledge is captured in the solution.</li> </ul>	Paal and Mosral	During design	DTI	Project Unit
<b>Construction Phase – Kosrae Defence Upgrades</b>						
<b>Environmental Impacts</b>						
Construction of Revetments	Increased risk of sedimentation and erosion of shoreline from movement of heavy machinery	<ul style="list-style-type: none"> <li>The construction footprint on the reef flat will be minimise to no more than 10m in width from the toe of the beach/revetment and will not extend beyond the southern or northern extent of the proposed defence section.</li> <li>Access to the reef flat by construction plant will be over the beach within the area of proposed defence reconstruction.</li> <li>At Paal additional care will be taken to ensure no heavy plant encroaches to or impacts on the root system of the mangrove strand that is located further seaward on the reef flat at</li> </ul>	Paal and Mosral	Throughout construction	Contractor	DTI & Project Unit

Activity	Significant Potential Impacts	Mitigation Measures	Location	Timing/ Duration	Who Implements	Who Supervises
		the southern end of the proposed defence extent.				
	Risk of fuel or oil spills into marine environment from construction machinery	<ul style="list-style-type: none"> <li>Spill kits will be available on site during construction works and all staff members will be trained in their use.</li> <li>No refueling activities or storage of hazardous substances are permitted at the coastal construction site.</li> </ul>	Paal and Mosral	Throughout construction	Contractor	DTI & Project Unit
Exposure of soils during reconstruction	Removing the existing armour and regrading underlying beach will result in additional suspended sediment	<ul style="list-style-type: none"> <li>No burning of ground cover for clearing shall be practiced.</li> <li>No vegetation should be removed from the shoreline berm beyond the southern extent of the proposed defences at Paal and Mosral.</li> <li>Stockpiles of beach sand, coral rubble or rock armour will not be located where material can be washed into a drain, stream or wetland area, including on a road pavement, on an overland flow path or within 15m of a stream bank, wetland or mangrove.</li> <li>All rock used in the construction of the defences will be volcanic in origin, come from licensed quarry sites, and will be clean and free from silt and other loose terrestrial material.</li> <li>A staged approach will be adapted to remove the existing armour layer, reprofiling the underlying beach, laying the geotextile filter layer and replacing the concrete slab/block and rock armour layer. This will ensure that there is a minimal length of beach exposed at any time</li> </ul>	Paal and Mosral	Throughout construction	Contractor	DTI & Project Unit

Activity	Significant Potential Impacts	Mitigation Measures	Location	Timing/ Duration	Who Implements	Who Supervises
		reducing the potential for increased suspended sediments at high tide. <ul style="list-style-type: none"> <li>• Where stockpiling of sediment material is conducted on land or any land areas are cleared of vegetation, geotextile sediment fencing will be erected around all areas. The fence will be installed prior to stockpiling/clearing, as close to the contour of the site as possible, with the bottom edge of the fence buried to at least 150mm, and the fence posts installed on the downside of the fabric. The fences will be checked regularly and where sediment has built up, this will be removed.</li> <li>• As soon as possible after the works are completed, rehabilitation of and exposed areas, such as the road verge will be undertaken.</li> </ul>				
Solid Waste Generation	Potential for pollution to be created by the improper management of solid waste	<ul style="list-style-type: none"> <li>• All non-hazardous, non-recyclable waste will be placed in containers and regularly emptied and disposed of to a permitted landfill site.</li> <li>• On completion of the works, all surplus materials and construction debris shall be removed and recycled or disposed of in an appropriate manner.</li> </ul>	Paal and Mosral	Throughout construction	Contractor	DTI & Project Unit
Control and disposal of hazardous materials	Pollution of marine and terrestrial environment	<ul style="list-style-type: none"> <li>• Lubricants and used oils will be stored in approved containers and promptly removed from site and disposed of as directed by KIRMA</li> <li>• Care will be taken to prevent any releases or spills of fuel and lubricants during fueling and maintenance of construction</li> </ul>				

Activity	Significant Potential Impacts	Mitigation Measures	Location	Timing/ Duration	Who Implements	Who Supervises
		<p>equipment and will be prevented from entering the ground, drainage areas or water courses by using appropriate containers and bunds. No such activities will be undertaken within at least 15m of the coast.</p> <ul style="list-style-type: none"> <li>• Any oily debris and contaminated soils will be recovered and disposed of as directed by KIRMA</li> <li>• Adequate sanitary convenience that meets public health and environmental requirements will be provided for construction staff on site.</li> </ul>				
Operation of laydown site	Environmental risks to ground water, coastal water and soil from poorly planned and managed construction staging and laydown site	<ul style="list-style-type: none"> <li>• Laydown areas will be sited on public or government owned land.</li> <li>• Areas will be securely fenced.</li> <li>• Bunded and covered areas will be installed for the storage and handling of hazardous materials and/or substances, the wash down of machinery and the preparation of concrete.</li> <li>• Run off from these bunded areas will be collected, treated and tested before being either reused for construction purposes or allowed to discharge into the ground, away from the marine environment. Discharge will be at a rate to allow absorption without causing surface flooding</li> <li>• Segregated storage for solid waste will be provided. This area will be clearly marked and designed to ensure that as waste is secure.</li> <li>• Water conservation measures will be implemented and workers trained on this.</li> </ul>	Paal and Mosral	Throughout construction	Contractor	DTI & Project Unit

Activity	Significant Potential Impacts	Mitigation Measures	Location	Timing/ Duration	Who Implements	Who Supervises
		<ul style="list-style-type: none"> <li>Regular inspection of machinery to ensure it is in good working order.</li> </ul>				
<b>Social Impacts</b>						
Haulage of Construction Materials	Noise and dust nuisance from haulage works	<ul style="list-style-type: none"> <li>Consultations will be undertaken with affected residents prior to commencement of works to advise of potential impacts and management measures.</li> <li>Construction vehicles using public and private roads will be clean with loads secured to prevent accidental spillage. Any accidental spillage of material transported on to roads beyond the immediate construction area will be promptly cleaned up.</li> <li>Establishment of machinery storage and washdown areas will be kept to a minimum and will be removed and the area reinstated and vegetated after construction. Any washdown areas shall be a minimum of 15m from any natural water course and washdown run off will not be discharged into natural waterways</li> </ul>	All haulage routes	Throughout construction	Contractor	DTI & Project Unit
	Increased risk to other vehicle and pedestrian traffic	<ul style="list-style-type: none"> <li>Equipment and trucks passing through Malem village and other residential areas will slow to an appropriate speed to avoid noise and vibration disturbance as far as possible.</li> <li>Spotters will be used at key junctions and through villages to ensure haulage trucks are keeping to the speed limit</li> <li>Signage will be installed to advise drivers of the speed limit through residential areas.</li> </ul>	Malem to Utwe	Throughout construction	Contractor	DTI & Project Unit

Activity	Significant Potential Impacts	Mitigation Measures	Location	Timing/ Duration	Who Implements	Who Supervises
Construction near residential areas	Community health and safety risks from construction activities	<ul style="list-style-type: none"> <li>• Community consultations carried out as per this ESMP.</li> <li>• Post signs on the laydown sites advising community member to keep out.</li> <li>• Install secure fencing around laydown sites.</li> <li>• Construction work will only be carried out during normal business hours.</li> <li>• Assign personnel to manage traffic movement and safety as required.</li> </ul>	Paal and Mosral	Throughout construction	Contractor	DTI & Project Unit

### 7.3.2 Monitoring Plan for Kosrae Coastal Defence Upgrades

Activity	Mitigation Measures	Monitoring / Frequency	When	Who will monitor	Supervision
<b>Pre-Construction Phase – Kosrae Coastal Defence Upgrades</b>					
<b>General Impacts</b>					
Safeguard Integration	<ul style="list-style-type: none"> <li>The ESMP shall be included in the TORs or works agreements.</li> </ul>	One-off: Prior to release of any contract documents	Before tender	DECEM	SPREP
	<ul style="list-style-type: none"> <li>Include key mitigation measures from ESMP within the works agreement, particularly the detailed roles as described in Section 8.</li> </ul>	One-off: Prior to release of any contract documents	Before tender	DECEM	SPREP
	<ul style="list-style-type: none"> <li>The ESMP will be included in the contractors specification and contract.</li> <li>Specific mitigation measures for the contractor / supplier shall be highlighted in the general conditions.</li> </ul>	One-off: Prior to release of any contract documents	Before tender	DECEM	SPREP
	<ul style="list-style-type: none"> <li>Obtain Development Consent from KIRMA based on the Kosrae EIA Regulations and using this ESMP to inform the application.</li> </ul>	One off: prior to commencement of works	During design process	DECEM	SPREP
<b>Environmental Impacts</b>					
Design of Revetment Works	<ul style="list-style-type: none"> <li>Design of revetment shall include input from DTI engineers to ensure best practices design of the transition between the defence and the beach to the south.</li> <li>The revetment at Paal will extend behind the existing shoreline at this point to ensure that outflanking and downdrift erosion does not occur.</li> <li>The revetment at Mosral at the southern end will be constructed at a shallower slope and armour rock used to construct a wider and flatter toe on the reef flat. This will ease the transition from defence to the beach and help prevent downdrift and outflanking effects.</li> </ul>	One-off: Design requirements of ESMP are incorporated into design	Prior to final approval of design	Project Unit	SPREP

Activity	Mitigation Measures	Monitoring / Frequency	When	Who will monitor	Supervision
	<ul style="list-style-type: none"> <li>Design of the revetments will include design of repairing the outflow at Mosral to ensure effective linkage between the two pieces of infrastructure.</li> </ul>	One-off: Final designs include repair/upgrade of Mosral outflow	Prior to approval of final design	Project Unit	SPREP
<b>Social Impacts</b>					
Design of Revetment	<ul style="list-style-type: none"> <li>Ensure all key community stakeholders are included in the consultations for the final revetment design to ensure local knowledge is captured in the solution.</li> </ul>	One off: report of consultations sighted	Prior to approval of final design	Project Unit	SPREP
<b>Construction Phase – Kosrae Defence Upgrades</b>					
<b>Environmental Impacts</b>					
Construction of Revetments	<ul style="list-style-type: none"> <li>The construction footprint on the reef flat will be minimise to no more than 10m in width from the toe of the beach/revetment and will not extend beyond the southern or northern extent of the proposed defence section.</li> <li>Access to the reef flat by construction plant will be over the beach within the area of proposed defence reconstruction.</li> <li>At Paal additional care will be taken to ensure no heavy plant encroaches to or impacts on the root system of the mangrove strand that is located further seaward on the reef flat at the southern end of the proposed defence extent.</li> </ul>	Weekly: no evidence of machinery working outside of the 10m boundary.  No evidence of other beach access being used by machines other than over existing work site.  Mangrove root system remains undamaged at Paal	Duration of works	Project unit	DECCEM
	<ul style="list-style-type: none"> <li>Spill kits will be available on site during construction works and all staff members will be trained in their use.</li> <li>No refueling activities or storage of hazardous substances are permitted at the coastal construction site.</li> </ul>	Weekly: spill kit available on site.  All refueling happening at designated sites away from coast.	Duration of works	Project unit	DECCEM

Activity	Mitigation Measures	Monitoring / Frequency	When	Who will monitor	Supervision
Exposure of soils during reconstruction	<ul style="list-style-type: none"> <li>• No burning of ground cover for clearing shall be practiced.</li> <li>• No vegetation should be removed from the shoreline berm beyond the southern extent of the proposed defences at Paal and Mosral.</li> <li>• Stockpiles of beach sand, coral rubble or rock armour will not be located where material can be washed into a drain, stream or wetland area, including on a road pavement, on an overland flow path or within 15m of a stream bank, wetland or mangrove.</li> <li>• All rock used in the construction of the defences will be volcanic in origin, come from licensed quarry sites, and will be clean and free from silt and other loose terrestrial material.</li> <li>• A staged approach will be adapted to remove the existing armour layer, reprofiling the underlying</li> </ul>	<p>One off: Contractors plan includes staged approach</p> <p>Stockpile sites adhere to ESMP requirements.</p> <p>Revegetation has occurred on completion</p>	Prior to commencement of works	Project Unit	DECEM

Activity	Mitigation Measures	Monitoring / Frequency	When	Who will monitor	Supervision
	<p>beach, laying the geotextile filter layer and replacing the concrete slab/block and rock armour layer. This will ensure that there is a minimal length of beach exposed at any time reducing the potential for increased suspended sediments at high tide.</p> <ul style="list-style-type: none"> <li>Where stockpiling of sediment material is conducted on land or any land areas are cleared of vegetation, geotextile sediment fencing will be erected around all areas. The fence will be installed prior to stockpiling/clearing, as close to the contour of the site as possible, with the bottom edge of the fence buried to at least 150mm, and the fence posts installed on the downside of the fabric. The fences will be checked regularly and where sediment has built up, this will be removed.</li> <li>As soon as possible after the works are completed, rehabilitation of and exposed areas, such as the road verge will be undertaken.</li> </ul>	<p>Weekly: no evidence of burning</p> <p>No vegetation cleared in excess of project footprint</p> <p>Stockpiles are correctly located and well managed.</p> <p>Aggregates or rocks are clean</p>	For duration of works	Project Unit	DECCEM
Solid Waste Generation	<ul style="list-style-type: none"> <li>All non-hazardous, non-recyclable waste will be placed in containers and regularly emptied and disposed of to a permitted landfill site.</li> <li>On completion of the works, all surplus materials and construction debris shall be removed and recycled or disposed of in an appropriate manner.</li> </ul>	<p>Weekly: Waste collection at laydown area is secure, well signed and clean.</p> <p>Good housekeeping around project sites.</p> <p>Waste is being removed to a KIRMA approved disposal site.</p>	For duration of works	Project Unit	DECCEM
Control and disposal of hazardous materials	<ul style="list-style-type: none"> <li>Lubricants and used oils will be stored in approved containers and promptly removed from site and disposed of as directed by KIRMA</li> <li>Care will be taken to prevent any releases or spills of fuel and lubricants during fueling and maintenance of construction equipment and will be prevented from entering the ground, drainage areas</li> </ul>	One off: all mitigation provisions are in place	Prior to commencement of concrete production	Project Unit	DECCEM

Activity	Mitigation Measures	Monitoring / Frequency	When	Who will monitor	Supervision
	or water courses by using appropriate containers and bunds. No such activities will be undertaken within at least 15m of the coast. <ul style="list-style-type: none"> <li>Any oily debris and contaminated soils will be recovered and disposed of as directed by KIRMA</li> <li>Adequate sanitary convenience that meets public health and environmental requirements will be provided for construction staff on site.</li> </ul>	Weekly: oils and lubricants stored correctly Good housekeeping at site Waste is being disposed of as per KIRMA instructions	During concrete production works	Project Unit	DECCEM
Operation of laydown site	<ul style="list-style-type: none"> <li>Laydown areas will be sited on public or government owned land.</li> <li>Areas will be securely fenced.</li> <li>Bunded and covered areas will be installed for the storage and handling of hazardous materials and/or substances, the wash down of machinery and the preparation of concrete.</li> <li>Run off from these bunded areas will be collected, treated and tested before being either reused for construction purposes or allowed to discharge into the ground, away from the marine environment. Discharge will be at a rate to allow absorption without causing surface flooding</li> <li>Segregated storage for solid waste will be provided. This area will be clearly marked and designed to ensure that as waste is secure.</li> <li>Water conservation measures will be implemented and workers trained on this.</li> <li>Regular inspection of machinery to ensure it is in good working order.</li> </ul>	One off: All mitigation measures are in place	Prior to commencement of works	Project Unit	DECCEM
		Weekly: all mitigation measures are in place and functional as per ESMP.	For duration of works.	Project Unit	DECCEM
<b>Social Impacts</b>					

Activity	Mitigation Measures	Monitoring / Frequency	When	Who will monitor	Supervision
Haulage of Construction Materials	<ul style="list-style-type: none"> <li>• Consultations will be undertaken with affected residents prior to commencement of works to advise of potential impacts and management measures.</li> <li>• Construction vehicles using public and private roads will be clean with loads secured to prevent accidental spillage. Any accidental spillage of material transported on to roads beyond the immediate construction area will be promptly cleaned up.</li> <li>• Establishment of machinery storage and washdown areas will be kept to a minimum and will be removed and the area reinstated and vegetated after construction. Any washdown areas shall be a minimum of 15m from any natural water course and washdown run off will not be discharged into natural waterways</li> </ul>	One off: consultations have taken place and plans are responsive to these comments Washdown area is correctly established	Prior to commencement of haulage	Project Unit	DECCEM
		Weekly: Roads are clear of spilled materials Good housekeeping at washdown sites	Duration of works	Project Unit	DECCEM
	<ul style="list-style-type: none"> <li>• Equipment and trucks passing through Malem village and other residential areas will slow to an appropriate speed to avoid noise and vibration disturbance as far as possible.</li> <li>• Spotters will be used at key junctions and through villages to ensure haulage trucks are keeping to the speed limit</li> <li>• Signage will be installed to advise drivers of the speed limit through residential areas.</li> </ul>	Weekly: Spotters are in place during haulage Any complaints from communities are addressed and resolved. Signage in place	Duration of haulage	Project Unit	DECCEM
Construction near residential areas	<ul style="list-style-type: none"> <li>• Community consultations carried out as per this ESMP.</li> <li>• Post signs on the laydown sites advising community member to keep out.</li> <li>• Install secure fencing around laydown sites.</li> <li>• Construction work will only be carried out during normal business hours.</li> <li>• Assign personnel to manage traffic movement and safety as required.</li> </ul>	One off: fences are in place, signs are in place and community has been consulted.	Prior to commencement of works	Project Unit	DECCEM
		Weekly: mitigation measures are being implemented as required in ESMP	Duration of works	Project Unit	DECCEM

## 7.4 Management Plan for Kosrae Inland Road Realignment

### 7.4.1 Environmental and Social Management Plan

Activity	Significant Potential Impacts	Mitigation Measures	Location	Timing/ Duration	Who Implements	Who Supervises
<b>Pre-Construction Phase – Kosrae Inland Road Realignment</b>						
<b>General Impacts</b>						
Safeguard Integration	No safeguard requirements being adhered to or considered during the design process	<ul style="list-style-type: none"> <li>The ESMP shall be included in the TORs or works agreements.</li> </ul>	Kosrae	During development of tender documents	Project Unit	SPREP
	No safeguard requirements being captured within the works agreement with the PIU	<ul style="list-style-type: none"> <li>Include key mitigation measures from ESMP within the works agreement, particularly the detailed roles as described in Section 8.</li> </ul>	Kosrae	During development of tender documents	Project Unit	SPREP
	No safeguard requirements being contractually applicable to the Contractor during project implementation	<ul style="list-style-type: none"> <li>The ESMP will be included in the contractors specification and contract.</li> <li>Specific mitigation measures for the contractor / supplier shall be highlighted in the general conditions.</li> </ul>	Kosrae	During development of tender documents	Project Unit	SPREP
	National safeguard legislation not adhered to during project implementation	<ul style="list-style-type: none"> <li>Obtain Development Consent from KIRMA based on the Kosrae EIA Regulations and using this ESMP to inform the application.</li> </ul>	Kosrae	Prior to commencement of works		
<b>Environmental Impacts</b>						
Design of road and drainage	Disruption of perennial and intermittent streams that drain the upper catchments into the marine environment	<ul style="list-style-type: none"> <li>Bridge and culvert design should be based on the most recent extreme rainfall intensity amount available for Kosrae (ADB, 2005) (shown in section 4.3 of the Environmental Impact Statement) using 2025 as the “present day” scenario and the design accommodate rainfall intensities to the 2050 projections.</li> <li>Bridges and culverts are designed to accommodate a 25 year return period flow.</li> </ul>	Malem to Utwe	During road design	Design Engineer	DTI
	Increased run off from increased road surface area exacerbating down stream flooding behind coastal berm.					

Activity	Significant Potential Impacts	Mitigation Measures	Location	Timing/ Duration	Who Implements	Who Supervises
		<p>This is higher than the 10 year return period specified in the design guidance, however a 25 year return period would make allowances for the uncertainties in climate predictions and surprises in rainfall response to climate change.</p> <ul style="list-style-type: none"> <li>• The road design standards include specifications for bridge and culvert wing walls to avoid bank erosion immediately upstream/downstream of each structure.</li> <li>• Where necessary rock mattresses or equivalent should be installed to prevent any erosion of either the upstream or downstream water course. If exit velocities from any of the culverts or bridges are likely to be significantly increased above normal, energy dissipation measures should also be included to minimise downstream erosion.</li> <li>• Align the road to minimise the long sloping sections, where necessary having shorter steep sections interspersed with flatter sections that follow the topographical contours.</li> <li>• Having in- or out-sloping road surfaces to encourage greater lateral flow.</li> <li>• Intercepting longitudinal water movements with dips or cross drains.</li> <li>• Slowing drainage flows in the swales or drains at the side of the road to prevent erosion of the drainage channel, through for example construction of regular check dams along sloping sections of the road. These are typically made out of graded rock, with other material such as sandbags able to be used as</li> </ul>				

Activity	Significant Potential Impacts	Mitigation Measures	Location	Timing/ Duration	Who Implements	Who Supervises
		a temporary measure until the rock check dams are installed.				
	Erosion and flooding of privately owned land from drainage outflow	<ul style="list-style-type: none"> <li>Ensuring no outflow from drainage expels onto private lands.</li> </ul>	Malem to Utwe	During design phase	Design Engineer	DTI
Identification of Laydown Sites	Environmental degradation and contamination of water resources if sites located close to or within the run-off path of waterways or the marine environment	<ul style="list-style-type: none"> <li>All stockpile or laydown sites will be located a minimum of 15m from any natural water course and at least 30m from the coastline.</li> <li>Laydown sites will be kept to a minimum and the areas will be reinstated and revegetated on completion of works.</li> <li>Laydown and stockpile sites should be on government land where possible. For any sites on private land, the owners should be fully consulted and will sign an agreement for temporary use of the land.</li> </ul>	All laydown sites	During design phase	DTI	KIRMA
Sourcing of Aggregates	For any locally sourced aggregates potential adverse impacts include air emissions, noise and vibration, waste, land conversion and dust.	<ul style="list-style-type: none"> <li>Local aggregates will only be sourced from quarries with existing permits from KIRMA and who are operating in compliance with the conditions of those permits.</li> </ul>	Quarries	Prior to commencement of works	DTI	KIRMA
	If imported consignments are not properly treated and/or washed before shipping, there is the risk of introducing non-native and potentially invasive plants, animals and disease.	<ul style="list-style-type: none"> <li>Any internationally imported equipment and materials will have to comply with FSM biosecurity and quarantine regulations.</li> </ul>	Kosrae	Prior to commencement of works	DTI	KIRMA
<b>Social Impacts</b>						

Activity	Significant Potential Impacts	Mitigation Measures	Location	Timing/ Duration	Who Implements	Who Supervises
Alignment through residential properties	Disruption to land owners access to and use of village property	<ul style="list-style-type: none"> <li>For any disputes over alignment through residential areas, the primary method of settling this would be through avoidance of the disputed area and a small realignment of the road to a more acceptable route.</li> </ul>	Malem to Utwe	During design phase	Design Engineers	Project Unit
Community Engagement	Misconceptions regarding the project raising peoples fears regarding project footprint and objectives	<ul style="list-style-type: none"> <li>Implement the Stakeholder Engagement and Consultation Plan (Section 5 of this ESMP)</li> </ul>	Malem to Utwe	During design phase	Project Unit	KIRMA and DECEM

7.4.2 Monitoring Plan for Kosrae Inland Road Realignment

Activity	Mitigation Measures	Monitoring / Frequency	When	Who will monitor	Supervision
<b>Pre-Construction Phase – Kosrae Inland Road Realignment</b>					
<b>General Impacts</b>					
Safeguard Integration	<ul style="list-style-type: none"> <li>The ESMP shall be included in the TORs or works agreements.</li> </ul>	One off: ESMP in TOR	Prior to release of any procurement document	DECEM	SPREP
	<ul style="list-style-type: none"> <li>Include key mitigation measures from ESMP within the works agreement, particularly the detailed roles as described in Section 8.</li> </ul>	One off: required elements included in contract	Prior to release of any procurement document	DECEM	SPREP
	<ul style="list-style-type: none"> <li>The ESMP will be included in the contractors specification and contract.</li> <li>Specific mitigation measures for the contractor / supplier shall be highlighted in the general conditions.</li> </ul>	One off: required elements included in contract	Prior to release of any procurement document	DECEM	SPREP
	<ul style="list-style-type: none"> <li>Obtain Development Consent from KIRMA based on the Kosrae EIA Regulations and using this ESMP to inform the application.</li> </ul>	One off: Development Consent approved	Prior to commencement of works	DECEM	SPREP
<b>Environmental Impacts</b>					
Design of road and drainage	<ul style="list-style-type: none"> <li>Bridge and culvert design should be based on the most recent extreme rainfall intensity amount available for Kosrae (ADB, 2005) (shown in section 4.3 of the Environmental Impact Statement) using 2025 as the “present day” scenario and the design accommodate rainfall intensities to the 2050 projections.</li> <li>Bridges and culverts are designed to accommodate a 25 year return period flow. This is higher than the 10 year return period specified in the design guidance,</li> </ul>	One off: All stipulated safeguard design requirements are included in detailed design	Prior to approval of detailed design	Project Unit	DECEM

Activity	Mitigation Measures	Monitoring / Frequency	When	Who will monitor	Supervision
	<p>however a 25 year return period would make allowances for the uncertainties in climate predictions and surprises in rainfall response to climate change.</p> <ul style="list-style-type: none"> <li>• The road design standards include specifications for bridge and culvert wing walls to avoid bank erosion immediately upstream/downstream of each structure.</li> <li>• Where necessary rock mattresses or equivalent should be installed to prevent any erosion of either the upstream or downstream water course. If exit velocities from any of the culverts or bridges are likely to be significantly increased above normal, energy dissipation measures should also be included to minimise downstream erosion.</li> <li>• Align the road to minimise the long sloping sections, where necessary having shorter steep sections interspersed with flatter sections that follow the topographical contours.</li> <li>• Having in- or out-sloping road surfaces to encourage greater lateral flow.</li> <li>• Intercepting longitudinal water movements with dips or cross drains.</li> <li>• Slowing drainage flows in the swales or drains at the side of the road to prevent erosion of the drainage channel, through for example construction of regular check dams along sloping sections of the road. These are typically made out of graded rock, with other material such as sandbags able to be used as a temporary measure until the rock check dams are installed.</li> </ul>				

Activity	Mitigation Measures	Monitoring / Frequency	When	Who will monitor	Supervision
	<ul style="list-style-type: none"> <li>Ensuring no outflow from drainage expels onto private lands.</li> </ul>	One off: No outflows designed to enter private lands	Prior to approval of final detailed design	Project Unit	DECEM

## 7.5 Erosion and Sedimentation Control Plan

Annex 2 contains the Erosion and Sedimentation Control Plan (ESCP) which is required for the coastal defence activities on Kosrae. The requirements of the plan are integrated into the relevant management plan tables above. The ESCP is developed based on the Kosrae Development Regulations and KIRMA development consent which require that at a minimum:

- Disturbance shall be limited during excavation, preserving as much of the vegetated area as possible.
- Where possible, divert upslope storm water around all lands that do not have a protective vegetative cover.
- Install sediment fences down slope of all disturbed lands to filter coarse sediment before it gets into the gutters, drains and watercourses.
- Place all stockpiles totally on the site, well away from drainage paths and, where they comprise erodible materials such as sand and soil, behind a sediment barrier.
- Soil and cement bags are covered at the end of the day.
- All earthmoving activities shall be planned in such a manner as to minimise the area of disturbed land, mangrove, reef or lagoon.
- All permanent facilities for the conveyance of water around, through or from the project site shall be designed to reduce the velocity of flow in the facility to speed that will not cause significant erosion.
- Within a section or area of the project, all slopes, channels, ditches or any disturbed area shall be stabilised as soon as possible after the final grade or final earth moving has been completed.
- Where it is not possible to permanently stabilise a disturbed area immediately after the final earthmoving has been completed or where the activity stops for more than 14 days, interim stabilisation measures shall be promptly implemented.
- Before filling or development activities occur within a body of water or tidal zone, adequate seawalls and/or breakwater facility shall be constructed to safely contain the fill without failure and to prevent accelerated sedimentation.
- Run off from a project area shall not be discharged into the waters of Kosrae state without effective means to prevent sedimentation.
- Solid separation facilities shall be installed which at a minimum:
  - i. A basin for settling solids out of the water shall be structurally sound and have sufficient capacity to hold the water that drains into the basin until the solids have settled out.
  - ii. The basin shall be cleaned when the settling of solid has reduced the capacity of the basin by 25 percent.
  - iii. Outlet structure shall be designed to allow only adequate settled water to be discharged, and at a rate that will not cause accelerated erosion

## 7.6 Site Selection for Water Security Interventions

Some guiding principles for the site selection for these activities are:

- Apply an age-gender-diversity perspective and use community-based approaches in ground truthing and site selection activities.

- SCTs should be sited so that all toilets can be used safely by all members of the local community, including children, older people and pregnant women.
- Sites should be selected to ensure fair and equitable access for all members of the community especially women.
- Ensure that all SCTs have hand washing facilities.
- Women must be consulted on the design and location of water security interventions.
- Ensure that the location of the SCT facilitate eliminates threats to the security of users, especially women and girls, day and night.

Another important thing to consider is contamination risk. Table 7 below provides some similar ‘rules of thumb’ for minimising the risk of water contamination.

Table 7: Minimum distances from sources of pollution<sup>9</sup>

Feature	Minimum distance from water source
Community-level solid waste dump	100m
Storage (or dumps) of petroleum, fertilisers or pesticides	100m
Places where animals are slaughtered	50m
Cemetery	50m
Toilets / latrines (open pit)	30m
Household waste dump	30m
Animal pens	30m
Laundry place	20m
Large trees with extensive root system	20m
Dwellings	10m

## 7.7 Technical Assistance and Policy Development

### 7.7.1 Policy, Regulations and Plan Development

Any development of policies or programs will follow the citizen engagement, gender and safeguard policies ensuring that all affected parties are engaged in the process of development and that broader impacts on gender, environment, etc. are considered.

#### 7.7.1.1 Gender Mainstreaming

The design of the project requires equal and active participation, however, there is a risk that gender may not be mainstreamed into the Framework for National Water and Sanitation Policy in FSM, the National Water and Sanitation Policy, National Water Outlook Program and the Water Sectoral Investment Plan.

In order to ensure these activities fully incorporates the AF Gender Policy, a gender specialist should be hired to undertake a gender-sensitive review of the policy frameworks and plans. The specialist

<sup>9</sup> Environmental assessment and risk screening for rural water supply. Consortium for Sustainable Water, Sanitation & Hygiene in Fragile Contexts, 2015.

should refer to experiences and tools from previous CCA projects, e.g. PACC, GCCA, IWRM, Pacific Gender & Climate Change Toolkit as well as the Adaptation Fund's Gender Policy and Action Plan and the associated guidelines for this plan. The findings from the review will be used to inform and strengthen the final outputs of these activities.

#### 7.7.2 Consultants

Consultants may be required for the ground truthing assessments and the development of the teacher's guide. TORs for any consultants will require the consultant to comply with the ESMP and the AF safeguards and gender policies.

For all technical assistance consultants this ESMP will be included in the TOR and final contract.

#### 7.7.3 Capacity Building and Materials Development

Awareness materials will be developed and awareness raising activities will be undertaken under the project aimed at the general public for raising awareness on climate change. Gender balance shall be considered during the activities to ensure that women are equally represented.

#### 7.7.4 Municipality Development Plans

The plans developed under output 4.1 will serve as the overall strategic plans of the communities. These will be climate and disaster resilient plans that link all sector plans that exist currently for the islands integrating approaches with the view to reduce the vulnerability and promote risk reduction measures to island water and municipality coastal resources.

A safeguards assessment will be required for each of the development plans to ensure that any potential environmental or social impacts of the are properly understood and measures are incorporated to avoid, minimise or mitigate for these impacts.

## 8 ESMP Implementation

### 8.1 Integration of ESMP into Project Management

This ESMP will be included in all bid document packages.

The safeguards requirements of this ESMP will be referenced in appropriate parts of the technical specification, Contractors contract and any TORs for supervision or issued under the project. The IE will be required to review all bid documents prior to approval.

Prior to commencement of works, the Kosrae road Contractor will be required to attend a half day pre-construction safeguards workshop with the IE Safeguards Specialist to ensure that all parties understand their obligations under the terms of the Contract.

### 8.2 Roles and Responsibilities

The agencies with important responsibilities for ESMP implementation, monitoring and reporting are MoF, MCT (Task Force and PIU), The PPP Private Entity and the Contractor. Details of the roles assigned to various agencies / organizations are summarised below –

#### 8.2.1 Project Board

The Project Board is formed of representatives from the IE (SPREP) and the EE (DECEN, KIRMA, R&D Yap, EPA Chuuk, EPA Pohnpei) as well as high level community representatives in the project areas. The board is chaired by the Director General of SPREP. The Board is directly involved in the GRM, to resolve grievances that will be referred to it by the National Project Manager

#### 8.2.2 Implementing Entity

SPREP is the accredited IE for this project and provides a Country Programme Officer and high level project management support to the Executing Entity. As the accredited IE, SPREP is fully responsible (legally and financially) for the implementation of this project including the safeguards standards required by the Adaptation Fund. The IE:

- Acts as a focal point for communications with AF on project related matters;
- Ensures compliance with AF funding requirements, including safeguard compliance;
- Provide inputs into project scope and design;
- Provide additional technical capacity to PMU where required
- Updating the ESMP as necessary to reflect changes in the designs;

#### 8.2.3 Project Management Unit under DECEN

A Project Management Unit (PMU) is has been established within DECEN and it includes a National Project Coordinator, Knowledge and Communications Officer, Project Accountant and a Project Officer on Kosrae. The PMU will maintain responsibility for the implementation of the ESMP and supervision of safeguards aspects of technical advisory and physical works for the duration of the project. Where additional technical capacity is required by the PMU, the IE will procure this resource.

The PMU will have the responsibility to oversee the implementation of the ESMP and their responsibilities include, but are not limited to:

- Acts on behalf of the Project Board and works closely with all contracted parties to ensure that project objectives are delivered in a compliant manner consistent with State and AF safeguard requirements;

- Monitor and evaluate project activities and outputs and report the findings to the Project Board by periodic progress reports. These reports will include all aspects of safeguards compliance of the project including the results of scheduled monitoring, and instances of non-compliance, any environmental incidents and any GRM submissions/responses.
- On Kosrae, conducting quarterly safeguard audits with the Supervision Engineer and other staff;
- Weekly monitoring of the physical investments on Kosrae as per the requirements of the ESMP Supervision Plan for compliance with the ESMP;
- Monitors and manages all complaints/incidents reported to the Project GRM;
- Manages the review process of Contractors management plan up to formal approval;
- Updating the ESMP as necessary to reflect project change;
- Applying for all approvals and permits;
- Facilitate meaningful consultations with stakeholders and communities to enable them to provide meaningful input and direction into the Project;
- Publicly discloses any project information and reports including this ESMP;
- Provide support and recommendations to the Supervision Engineer for any instances of Contractor non-compliance;
- Receive and review monthly reports from Supervision Engineer and share reports with Project Director.
- PMU with the support of Project Board is responsible for managing recurring instances of non-compliance by the Contractor as they are referred by the Supervision Engineer.
- Responsible for managing all instances of non-compliance by the Supervision Engineer

The PMU National Project Coordinator will be responsible for overall project coordination and technical guidance and will support the procurement of various packages and studies. Technical staff will be recruited as necessary to support the implementation of technical advisory components.

A locally based community liaison officer or safeguards administration officer may be recruited if necessary to support the PMU during busy periods such as consultations or construction monitoring.

#### 8.2.4 Design Engineer

It is the Design Engineers responsibility to:

- Comply with this ESMP in the development of the detailed design, procurement bid documents and other advice to the PMU;
- Avoid or minimise environmental and social impacts by design;
- Undertake meaningful consultation with stakeholders to inform the design process.

#### 8.2.5 Contractors

This section is applicable to any party undertaking physical building works under any project activity.

It is the Contractors responsibility to:

- Ensure the Contractors project team includes experienced HSE experts with sufficient in-country time allocation and financial resources specified in the Contract;
- Prepare and have cleared by the Supervision Engineer the any environmental management plans required in this ESMP prior to commencement of works;
- Carry out the project activities in accordance with the ESMP;
- Not to undertake any works or changes to works unless first approved in an updated CESMP;

- Conduct daily and weekly safeguard inspections of the works to ensure compliance and reporting the results of these inspections to the Supervision Engineer;
- Undertake community consultations as required in this ESMP in coordination with the PMU;
- Advise the Supervision Engineer of any changes to works or methods that are outside the scope of the ESMP for updating;
- Post all notifications specified in this ESMP at the site entrance;
- Report all environmental and OHS incidents to the Supervision Engineer for any action;
- Provide monthly reports of all safeguard monitoring, incidents, complaints and actions to the Supervision Engineer;
- Maintain a database of all complaints, incidents or grievances received. Any issues which cannot be dealt with immediately should be reported to the Supervision Engineer.

#### 8.2.6 Supervision Entity

The Supervision Entities are responsible for the day to day oversight of the construction or other works for the project, including safeguard compliance. On Kosrae, the Supervision Engineer will be DTI and will work closely with the Contractor on a daily basis to ensure that the project is implemented in a compliant manner consistent with the detailed designs provided and the ESMP. They are responsible for:

- Daily monitoring the Contractors work for compliance with the ESMP as per the measures detailed in Sections 7.2, 7.3 and 7.4 providing safeguard monitoring results in their monthly reporting to PMU. As part of their ESMP monitoring responsibilities, the Supervision Engineer will ensure that a suitably experienced engineer or /HSE officer is resourced to provide regular site inspections and is available for support at other times to respond to incidents, non-compliances and other tasks.
- Working with Contractor and PMU to provide meaningful input and direction into community consultations;
- Managing instances of non-compliance by the Contractor and reporting all instances to PMU. They are also responsible for escalating recurring instances of non-compliance by the Contractor to PMU for action;
- Managing and responding to all direct complaints/incidents received by their representatives as per the GRM process in Section 5.6 and reporting all instances to PMU for inclusion into Project database.

#### 8.2.7 Technical Advisors / Consultants

All technical advisors are required to comply with the ESMP and Safeguards Policy more broadly in terms of the work methodologies and outputs. They will be required to work with the PMU to ensure adequate citizen and stakeholder engagement in their work programme.

### 8.3 ESMP Budget

For the Kosrae road construction, the costs of implementing the ESMP for the Contractor will be included in the tender documents and shown as a line item in the BOQ. It is the contracting parties responsibility to ensure that they have provided adequate financial resources to undertake all responsibilities as prescribed in this ESMP.

The following is an approximate budget for implementing the ESMP by the PMU, based on the tables in Section 7 and the responsibilities detailed in Section 8.

Budget Item	Detail	Timeframe	Cost Estimate (USD)
<b>Nanumaga Harbour and Funafuti Port</b>			
Stakeholder consultations	All four States: Catering, venue hire, media, materials, travel and accommodation, translation and interpretation services, etc.	Prior to commencement of works and then ongoing as needed	25,000
ESMP Training for Project Teams	Travel and accommodation to Pohnpei, catering, venue hire	On finalization of ESMP prior to commencement of works	15,000
Disclosure of safeguards instruments	Translation, report production, distribution	Prior to start of works	4,000
GRM related costs	Personnel, communication, transportation, office support costs	All of project implementation	5,000
Monitoring and Reporting	Non-staff costs: logistics and report production	All of project implementation	5,000
	<b>Estimated Total Budget</b>		<b>50,000</b>

## 9 Capacity Development & Training

### 9.1 Capacity Development

The EE has no inhouse safeguards specialists, therefore the IE will provide technical safeguards advice when required.

### 9.2 Training

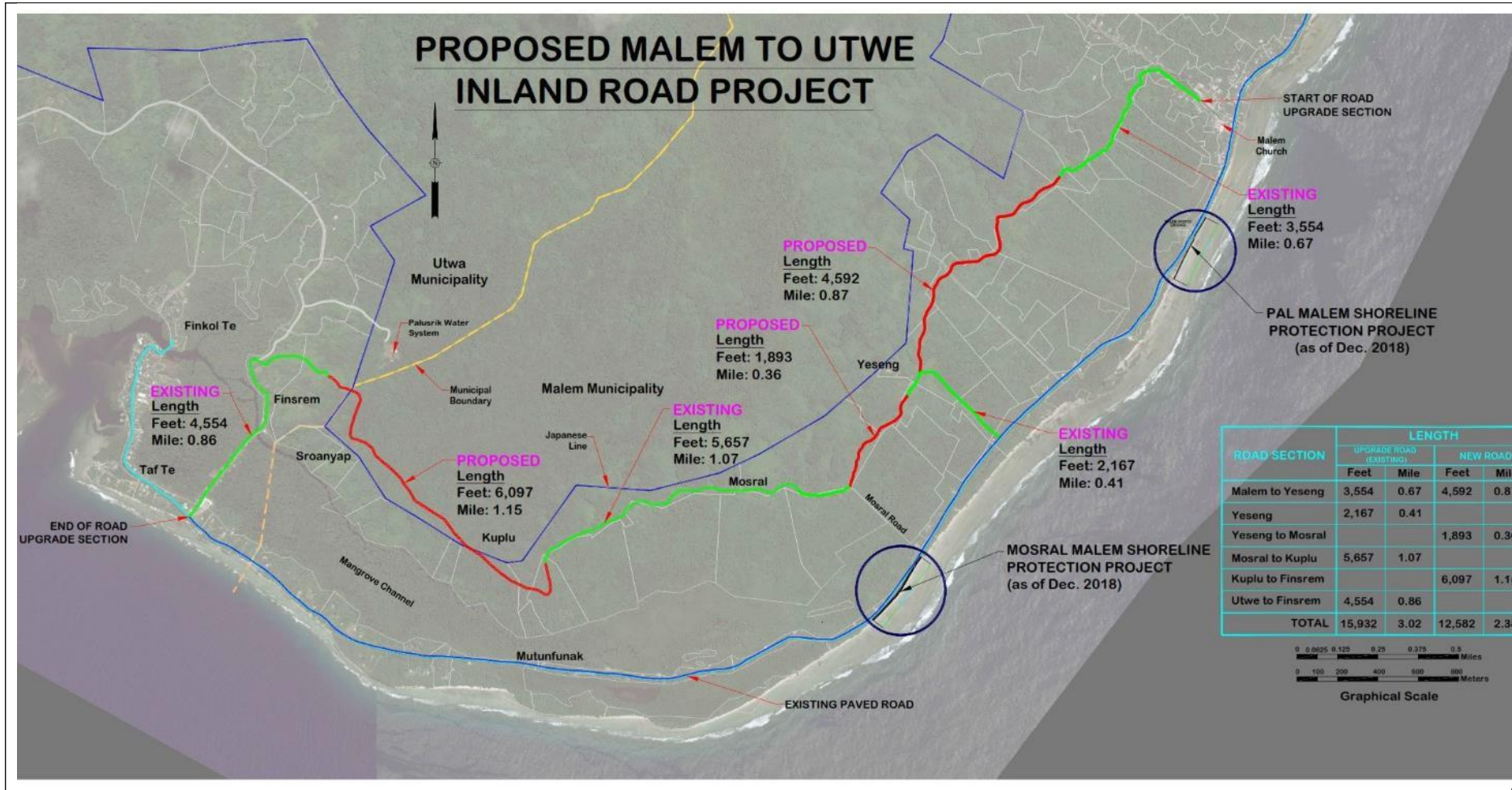
The PMU and project teams will require training to ensure effective implementation and oversight of the ESMP.

Areas recommended for PMU training include the following –

- Adaptation Fund safeguard policies, in particular those triggered and relevant to the project;
- Roles and responsibilities of different key agencies in safeguards implementation;
- How to effectively integrate the ESMP into project management, implementation, monitoring and reporting;
- Management of the GRM;
- How to facilitate meaningful community consultations;
- Integration of the ESMP and safeguard specific clauses into the contract and bid documentation.

On-going support will be provided by the IE for the duration of the project.

- Annex 1: Kosrae Inland Road Detailed Alignment



- Annex 2: Sediment and Erosion Control Plan

Aspect	Measures	Timeline	Indicators	Responsibility
Governance and Monitoring	Setting up of reporting plan to oversee, inspect and monitor erosion and sediment control measures, including rehabilitation of exposed areas and revegetation of buffer areas	Monthly	Records of weekly monitoring  Records of non-compliance and actions taken  Monthly report submitted	Project Unit
	Establishment of a GRM to address public and/or community issues and concerns	Ongoing	Number of grievances received and actions taken	DTI
Implementation and Construction	Minimise land disturbance by clearing the smallest practical width to accommodate the new inland road ahead of construction, as well as ensuring the land is disturbed for the shortest possible time	Construction phase	Sediment run off minimised from project site	Contractor, DTI
	Stage clearing activities, where possible, so that only the areas which are being actively developed are exposed	Construction phase	Sediment run off minimised from project site	Contractor, DTI
	No burning of ground cover during vegetation clearing	Construction phase	Sediment run off minimised from project site	Contractor, DTI

Aspect	Measures	Timeline	Indicators	Responsibility
	<p>Stockpiles of aggregates/materials will not be located where they can be washed into a drain, stream or wetland area, including on a road pavement, on a drainage or on overland flow path or within 15m of a stream bank, wetland or mangrove</p>	<p>Construction phase</p>	<p>Proper storage of construction materials</p>	<p>Contractor, DTI</p>
	<p>Stockpiles or any erodible materials (e.g. gravel, sand, soil) will be placed behind a sediment barrier. Gravel/sand/soil and cement bags will be covered appropriately at the end of each construction day</p>	<p>Construction phase</p>	<p>Proper storage of construction materials</p>	<p>Contractor, DTI</p>
	<p>Geotextile sediment fencing will be erected around all areas where vegetation has been cleared and soil exposed. The fence should be installed prior to clearing, as close to the contour of the site as possible, with the bottom edge of the fence buried to at least 150 mm, and the fence posts installed on the downside of the fabric. The fences will be</p>	<p>Construction phase</p>	<p>Fence erected and soil protected</p>	<p>Contractor, DTI</p>

Aspect	Measures	Timeline	Indicators	Responsibility
	checked regularly and where sediment has built up, this will be removed.			
	Install temporary drains or bunds around cleared areas to divert stormwater upslope where necessary, and to prevent discharge of stormwater. Any structures for water conveyance will be designed to reduce the velocity of flow so as not to cause significant erosion	Construction phase	Proper channelling of stormwater, sediment control and prevention of sedimentation of waterways	Contractor, DTI
	Install sediment traps to slow run-off containing sediment and a basin to allow settlement of coarse sediment.	Construction phase	Sediment control and prevention of sedimentation of waters	Contractor, DTI
	Install erosion control matting or mulch on any exposed batter slopes prior to revegetation, if required	Construction phase	Soil erosion control and prevention of sedimentation of waters	Contractor, DTI
	Upon completion of works, removal of stormwater and sediment control structures/equipment	Post construction phase	Area clean, to contribute to successful rehabilitation	Contractor, DTI
	Rehabilitation, grading and stabilisation of exposed and disturbed soil areas on the shoulder and adjacent areas. Excavated topsoil will be	Post construction phase	Area successfully rehabilitated	Contractor, DTI

Aspect	Measures	Timeline	Indicators	Responsibility
	stockpiled and re-used and revegetation completed of bare areas.			
	Revegetating buffer areas around streams and other catchment drainage pathways (planting of native species around streams and potential food trees along the edge of road shoulder)	Post construction phase	Buffer area revegetated	KCSO, Malem and Utwe communities, KIRMA

- [Annex 3: SPC Composting Toilets Guide](#)

[Link To: SPC Self Composting Toilets in the Pacific Islands Guide](#)

## Annex C. Complementary programmes and projects

Project	Objectives	Complementarity	Geographical coverage / Agency
Micronesia Challenge (MC)	Sub-regional conservation initiative which enhances community resiliency by using traditional knowledge and ecosystem strategies to conserve vulnerable coastal land resources by 2020; goals are to effectively conserve at least 30% of near-shore resources and 20% of terrestrial resources.	Construction of inland road with a community-based ecosystem management focus to reduce climate change impacts on road and community infrastructure and contribute to conserving terrestrial resources (mangrove forests and swamps) from future flooding events as a result of climate-proofing designs of the inland roads. Reducing impact of wastewater runoff into mangrove and lagoon effectively conserving vulnerable outer island environments	FSM, Palau, CNMI, Marshall Islands  KIRMA, KCSO (Kosrae State)
Micronesia Conservation Trust (MCT)	A charitable and irrevocable corporation organized to manage and provide funds for the accomplishment of the following mission: “to support biodiversity conservation and related sustainable development for the people of Micronesia by providing long term sustained funding.”	Promoting community-based ecosystem management practices complementing coastal infrastructure development  Promoting conservation of biodiversity in outer islands by changing common practices that pollute the surrounding environment and ground water resources	All States  KIRMA – Kosrae State  EPA – Chuuk, Pohnpei States  EPA, R&D – Yap State
Pacific Adaptation to Climate Change Project (PACC)	To enhance the capacity of the FSM to adapt to climate change and climate variability in coastal management  Kosrae was chosen as pilot State focusing on coastal infrastructure	Replication of the PACC activity in Tafunsak – climate proofing coastal road by relocating and constructing inland road. Building capacity of communities and coastline to climate variability.	Kosrae State / KIRMA
International Climate Change Adaptation Initiative-Pacific Adaptation Strategy	To enhance the capacity of partner country to assess key vulnerabilities and risks, formulate adaptation strategies and plans and mainstream adaptation into	Water harvesting and storage systems informed by best practices, methods, and surveys.	All States  EPA in Yap, Chuuk, and Pohnpei States

Assistance Program (ICCAI PASAP)	decision making. For FSM: adaptive strategies informed by best practice methods and improved knowledge: community participatory surveys conducted in Yap which included Ulithi and Fais Atolls; evidence-based field research conducted on drought and salt tolerant varieties of sweet potatoes and sweet taro in Dinay and Wugeem, Yap	Ground truthing assessments based on rapid assessments of water resources in response to drought	
Geospatial Analysis for Food Security Adaptation	Trying to find suitable places to relocate the agricultural areas (particularly taro) with the help of geospatial analysis (GPS, remote sensing) and geographic information systems.	Repairing rainwater harvesting systems and installing community tanks for outer island communities.  Watershed protection strategy to identify areas out of bounds for agriculture, residential and other developments	All States  EPA – Yap, Chuuk, Pohnpei  KIRMA, KCSO – Kosrae
Pacific - Australia Climate Change Science and Adaptation Planning Program	Supporting the government of FSM develop improved climate change projections and adaptation planning activities. FSM and 14 other Pacific countries are part of this AUD\$32 million project which builds on the foundation of the Pacific Climate Change Science Programme and the Pacific Adaptation Strategy Assistance Programme.	Establishing National Water Outlook Program	All States / DECEM
Implementing Sustainable Water Resources and Wastewater Management in Pacific Island Countries	The FSM's GEF Pacific IWRM Demonstration Project entitled "Ridge to Reef: Protecting Water Quality from Source to Sea" has strengthened national coordination in the water and sanitation sector and has enhanced community collaboration to improve water resource management. It has three main foci—(i) protected areas	Develop and endorse National Water and Sanitation Policy  Develop and implement national water outlook program  Develop and implement national water sector investment plan	Outer islands of Yap, Chuuk, Pohnpei States / R&D and EPA of each of the 3 states

	(improving existing ones and creating new ones), (ii) managing ecosystems outside protected areas, and (iii) improving agroecosystems.	<p>Repair and construct water harvesting and storage systems at the outer island level</p> <p>Train and build capacity of national water task force and relevant stakeholders at the state level</p>	
Water and Environmental Research Institute of the Western Pacific (WERI)	Mission is to seek solutions through research, teaching and outreach programs, to issues and problems associated with the location, production, distribution, and management of freshwater resources in Micronesia. Current projects and programs include watershed management program, rooftop rain catchment sizing, groundwater and aquifer research, atoll hydrologic modelling, water quality production and distribution, water resources management and GIS	Ground truthing assessments on water harvesting and storage systems	Outer islands of Yap, Chuuk, Pohnpei States / R&D and EPA of each of the 3 states
Global Climate Change Alliance: Pacific Small Island States	To support the governments of nine Pacific smaller island states, including FSM, in their efforts to tackle the adverse effects of climate change.	<p>Develop and implement national water outlook program</p> <p>Develop and implement national water sector investment plan</p> <p>Repair and construct water harvesting and storage systems at the outer island level</p> <p>Train and build capacity of national water task force and relevant stakeholders at the state level</p>	Outer islands of Yap, Chuuk, Pohnpei States / R&D and EPA of each of the 3 states
University of the South Pacific European Union	To develop and strengthen the Pacific ACP countries' capacity to	Ground truthing assessments on water harvesting and storage systems	Outer islands of Yap, Chuuk, Pohnpei States / R&D and EPA of each of the 3 states

Global Climate Change Alliance Project	adapt to the impacts of climate change.		
Coping with Climate Change in the Pacific Island Region (CCCPIR)	Undertaking mainstreaming climate change, and integrated land and marine resource management at the national and local level. Addressed six components ranging from regional and national mainstreaming of climate change, implementation of adaptation activities on the ground, and climate change related to tourism, energy, and education	Develop and endorse National Water and Sanitation Policy  Train and build capacity of national water task force and relevant stakeholders at the state level  Developing a Teacher's Guide on Climate Change at the state level	All States/ DECEM
Technical Assistance (TA) to FSM for Strengthening Infrastructure Planning and Implementation	support state utilities within the FSM) in executing infrastructure projects more effectively by having an agreed upon approach to systems and procedures for project planning, design, and management across the country; and build capacity in the Department of Transportation, Communications and Infrastructure (DTCI) to plan, design, and oversee project execution.	Design and construct the Malem-Utwe inland road Build capacity of DTI in implementing CCA projects	Kosrae State / DECEM, KIRMA, DTI
Second National Communications to the UNFCCC	National obligation under the UNFCCC to produce status report on national climate change measures and priorities. FSM is using a consultative approach involving a range of stakeholders to produce this report.	Implement water, sanitation, and health adaptation activities in outer islands  Develop climate resilient infrastructure	All States / DECEM
MAPCO2 Project	A MAPCO2 was deployed within the Chuuk Lagoon in November 2011. The goal of this joint effort is to establish a long-term monitoring station in Micronesia as part of	Developing legislative framework to oversee enforcement of coastal and marine resource management, including protection of environment from development projects	All States / DECEM

	global ocean monitoring network system for coral reef areas.	National Water Outlook Program	
Unite for Climate Pacific Regional Integrated Sciences and Assessments (Pacific RISA)	To enhance Pacific Island communities' abilities to understand, plan for, and respond to a changing climate. Emphasizing the engagement of communities, governments, businesses, and scientists by translating scientific research into information and materials that are valuable for stakeholders in key sectors such as water resources. Climate focused water sector education and outreach is part of Pacific RISA's core mission	Ground truthing assessments carried out for water resources in the outer islands will contribute to water sector education and will be excellent for outreach activities in FSM  Technical reports and other knowledge products developed from results of the project will contribute to information and materials valuable for future adaptation planning under water, health, sanitation, and coastal zone management.	All states / DECEM
Climate Adaptation, Disaster Risk Reduction and Education (CADRE)	Aims to build resilience of vulnerable communities to natural hazards particularly those that are climate induced.	Ground truthing assessments carried out for water resources in the outer islands will contribute to water sector education and will be excellent for outreach activities in FSM  Technical reports and other knowledge products developed from results of the project will contribute to information and materials valuable for future adaptation planning under water, health, sanitation, and coastal zone management.	All States / DECEM, Department of Education
U.S. Peace Corps Small Project Assistance (SPA) for Adaptation	Reaching out to remote communities by supporting the following efforts of Peace Corps volunteers: (1) development of youth camps that promote environmental awareness, knowledge and skills among the youth to become responsible natural resource stewards; (2) trainings that support community adaptation to climate change and build capacity for disaster risk reduction (DRR); and (3) small-	Implementing water harvesting and storage systems program in the outer islands  Installing / constructing self-composting toilets in outer / remote island environments, applying climate change and DRR principles	All States / EPA, R&D, KIRMA

	scale community projects that can demonstrate application of climate change and DRR principles		
Coastal Community Adaptation Project (C-CAP), 2013-2017	To build the resiliency of vulnerable coastal communities in the Pacific region to withstand more intense and frequent weather events and ecosystem degradation in the short-term, and sea level rise in the long-term.	Inland Road Relocation Initiative program Building capacity of landless to access land upland, and access to finance to assist with relocation Constructing inland road away from low and exposed coastal roads degraded from impacts of sea level rise	Kosrae State / KIRMA
Pacific Catastrophe Risk Assessment and Financing Initiative (PCRAFI)	To provide the Pacific Island Countries (PICs) with disaster risk modelling and assessment tools to help them better understand, model, and assess their exposure to natural disasters, and to engage in a dialogue on integrated financial solutions for the reduction of PICs financial vulnerability to natural disasters and to climate change.	Developing the Water Outlook Program.  Application of adaptation planning models and tools that include EIA, CBA, MEF, V&A assessment tool, mainstreaming, gender, and climate change tools  GIS spatial mapping exercise  Implementing Participatory 3 Dimension mapping exercise as a consultation tool	All States / DECEM

## **Annex D. Implementation Phase: key outcomes from stakeholder consultations**

The Inception workshops in the four states discussed and covered all the 4 Components of the project. The workshops were able to collect inputs, feedback, and recommendations from the State Leaders, Community Representatives, relevant governmental departments and all the NGO stakeholders. Consequently, workshops have concluded:

- The AF Project to develop climate change policies and assist in updating the states Joint State Action Plan for Disaster Risk Management and Climate Change (JSAP)
- The AF Project carry out water quality tests on the target islands and assessment/ surveys on conditions of existing water resources and take necessary action to support the target communities in increasing the target islands' water storage capacity attached maintenance, sustainability and monitoring plan and trainings
- Develop community-based awareness program to enhance the community population knowledge on climate change and its impacts and the most appropriate and cost effective adaptation and mitigation
- The AF PMU to carry out the inception workshop on the target islands to identify specific target sites for installation of water tanks and water infrastructures to be repaired and improved

As recommended from the States Inception workshops, the AF PMU, with support team from the respective States relevant stakeholders, carried out the inception workshops on the project target islands of Eauripik, Woleai, Nukuoro, Kapingamarangi, Lekinioch and Satawan. The target islands workshops were attended by municipal officials, traditional leaders, church leaders and community members from both gender groups.

This inception workshop is framed around a consultation approach and setting and ensure members engagement through group work and presentation by each group on their ideas and recommendations. The workshop interactions with participants focused on the five outputs of Component 2 to discuss, develop and recommend planned steps needed for each of the outputs implementation. Results from the community inception workshops highlighted preferred specific water resources and infrastructures for project sites and key areas the projects need to consider and provide during implementation of project. Majority of the key concerns provided from the participants were based on experiences from past project to the communities:

- Increase community engagement and participation during planning and implementation of project
- Better coordination of timing of transportation of project materials to the islands
- Good maintenance and sustainability program of what the project will provide to the community in regards to water tanks, wells and rain water harvesting system and toilets
- Better awareness and information sharing program on climate change and related phenomenon
- Preferred expert or experience consultant to carry out and provide training on construction and maintenance of the water and sanitation infrastructures with great understanding of the cultural setting of each island.

In addition to the introduction of the project activities to the community members, the traveling supporting teams from the government departments and project delivery partners share with the workshop participants their respective works in relations to climate change preparedness and mitigations. Due to time constraints of the transportation boat's mooring time at each of the target islands, the project partners had only enough time to share information but limited time to carry out any comprehensive trainings for the communities. The awareness information shared with community members include:

- Gender Equality Concepts
- Disaster, Mitigation and Relief activities
- Response to major emergencies, diseases and poverty
- Other similar project on water security
- Climate change and disaster risk reduction

## Annex E. Planning Phase: key meetings and findings

Meeting	Date	Stakeholder consulted	Key Findings
Consultative Meeting 1.1	22 June 2015	Pohnpei stakeholders	<ul style="list-style-type: none"> <li>• Re-affirming community support of project priorities</li> <li>• Ranking of priorities of the project</li> <li>• Role of community, island governing council and representatives on island proper (main island)</li> <li>• Coordination mechanism of the department with other government departments and NGOS/IGOs</li> </ul>
Consultative Meeting 1.2	24 June 2015	Chuuk stakeholders	<ul style="list-style-type: none"> <li>• Community confirmation of project priorities</li> <li>• Ranking of priorities of the project by the community</li> <li>• Role of community, island governing council and representatives on island proper (main island)</li> <li>• Coordination mechanism of the department with other government departments and NGOS/IGOs</li> </ul>
Consultative Meeting 1.3	25 June 2015	Yap stakeholders	<ul style="list-style-type: none"> <li>• Community confirmation of project priorities</li> <li>• Ranking of priorities of the project by the community</li> <li>• Role of community, island governing council and representatives on island proper (main island)</li> <li>• Coordination mechanism of the department with other government departments and NGOS/IGOs</li> </ul>
Consultative Meeting 1.4	6 July 2015	Kosrae stakeholders	<ul style="list-style-type: none"> <li>• Community confirmation of project priorities</li> <li>• Ranking of priorities of the project by the community</li> <li>• Role of community, island governing council and representatives on island proper (main island)</li> <li>• Coordination mechanism of the department with other government departments and NGOS/IGOs</li> </ul>
Consultative Meeting 2	16-19 November 2015 Palikir, Pohnpei,	Vice President, Secretary Department of Foreign Affairs, Secretary	<ul style="list-style-type: none"> <li>• Update Infrastructure Development Plan for Kosrae State and FSM</li> <li>• Plan for FSM Development Partner's Forum meeting in March 2016 to secure</li> </ul>

	Colonia, Pohnpei	Overseas Development Assistance, Secretary Ministry of Finance Governor Pohnpei Lieutenant Governor Pohnpei Director, EPA Pohnpei	donor support to co-finance and construct the Malem-Utwe road\ <ul style="list-style-type: none"> <li>• Coordination and collaboration mechanisms between national and state levels</li> </ul>
Follow up Meeting 1.1	23 November 2015 Kosrae State	Governor, Lt. Governor Kosrae Infrastructure Planning and Implementation Committee, Speaker of the Legislature Mayor of Malem Municipal Government Director DTI, Engineers DTI Director KIRMA and KIRMA Permitting Unit	<ul style="list-style-type: none"> <li>• Updated Infrastructure Development Plan for Kosrae State</li> <li>• Reviewed Malem-Utwe inland road within the priority listing of the IPIC list as one of two high infrastructure priorities of the state requiring immediate implementation</li> <li>• Review of CBA results, costings, and benefits of the Malem - Utwe inland</li> <li>• Identified potential risks of the Malem- Utwe inland road and agreed to carry out an Environmental Impact Assessment (EIA)</li> </ul>
Consultative Meeting 3	24-26 November 2015 Kosrae State	Kosrae State Government, NGO, IGO stakeholders	<ul style="list-style-type: none"> <li>• Improved the accuracy and usefulness of the cost benefit analysis</li> <li>• Developed the IRRI program</li> <li>• Formulated 'logic model' and developed monitoring and evaluation framework of the IRRI program</li> </ul>
Follow-up Meeting 1.2	27 November 2015 Kosrae State	Mayor of Malem Municipal Government Director DTI, Engineers DTI Director KIRMA and KIRMA Permitting Unit	<ul style="list-style-type: none"> <li>• Legislature approval of Malem-Utwe inland road as one of two high infrastructure priorities of the state</li> <li>• Review of CBA results, costings following consultation meeting with Kosrae stakeholders (consultative meeting 3)</li> <li>• Developed Terms of Reference for EIA</li> </ul>
Follow Up Meeting 1.3	30 November – 3 December 2015 Pohnpei State	Vice President, Ministry of Finance, Department of Foreign Affairs, ODA, OEEM,	<ul style="list-style-type: none"> <li>• Considered the Government of China as a potential donor to co-finance and construct the Malem-Utwe road</li> </ul>

		<p>Secretary Resources &amp; Development,</p> <p>United States Embassy</p> <p>Secretariat of the Pacific Community (SPC) Deputy Director General</p>	<ul style="list-style-type: none"> <li>• Coordination and collaboration mechanisms between national and state levels</li> <li>• Coordination between national, state and US Compact activities related to infrastructure priorities of states</li> <li>• Briefed potential collaboration with SPC sector related projects on food security, water resource management in outer islands, marine resource management (Marine Protected Areas, Fish Aggregating Devices)</li> </ul>
Follow Up Meeting 1.3	30 November – 3 December 2015 Pohnpei State	<p>Vice President, Ministry of Finance, Department of Foreign Affairs, ODA, OEEM, Secretary Resources &amp; Development,</p> <p>United States Embassy</p> <p>Secretariat of the Pacific Community (SPC) Deputy Director General</p>	<ul style="list-style-type: none"> <li>• Considered the Government of China as a potential donor to co-finance and construct the Malem-Utwe road</li> <li>• Coordination and collaboration mechanisms between national and state levels</li> <li>• Coordination between national, state and US Compact activities related to infrastructure priorities of states</li> <li>• Briefed potential collaboration with SPC sector related projects on food security, water resource management in outer islands, marine resource management (Marine Protected Areas, Fish Aggregating Devices)</li> </ul>
Follow Up Meeting 1.4	3 December 201 Pohnpei State	<p>College of Micronesia (COM)</p> <p>College Extension Services (CES-COM)</p> <p>College Research Extension (CRE-COM)</p>	<ul style="list-style-type: none"> <li>• Training of Agriculture Extension Officers for outer islands</li> <li>• Potential outer island activities on Food Security activities</li> <li>• Raised taro patches technology for outer islands</li> <li>• Coordination and collaboration with Food Security related projects</li> </ul>
Consultative Meeting 4.1	20-22 January 2016	Yap stakeholders	<ul style="list-style-type: none"> <li>• Trained government and community stakeholders on logic model and development of the Monitoring &amp; Evaluation Framework</li> <li>• Re-confirmed community priorities for the outer islands</li> <li>• Formulated 'logic model' and developed the MEF for water security, marine resource management and food security priorities</li> </ul>

			<ul style="list-style-type: none"> <li>Identified no potential social, economic, and environmental risks to any of the activities of the project</li> </ul>
Consultative Meeting 4.2	26-28 January 2016	Chuuk stakeholders	<ul style="list-style-type: none"> <li>Trained government and community stakeholders on logic model and development of the Monitoring &amp; Evaluation Framework</li> <li>Re-confirmed community priorities for the outer islands</li> <li>Formulated 'logic model' and developed the MEF for water security, marine resource management and food security priorities</li> <li>Identified no potential social, economic, and environmental risks to any of the activities of the project</li> </ul>
Consultative Meeting 4.3	1-3 February 2016	Pohnpei stakeholders	<ul style="list-style-type: none"> <li>Trained government and community stakeholders on logic model and development of the Monitoring &amp; Evaluation Framework</li> <li>Re-confirmed community priorities for the outer islands</li> <li>Formulated 'logic model' and developed the MEF for water security, marine resource management and food security priorities</li> <li>Identified no potential social, economic, and environmental risks to any of the activities of the project</li> </ul>
Follow Up Meeting 2.1	3 February 2016	Vice President FSM, ODA, R&D, MOF, OEEM, DFA	<ul style="list-style-type: none"> <li>Brief update of the proposal</li> <li>Further discussions with Government of China' support for co-finance and construction of the road to the tune of \$5m USD in technical assistance</li> <li>Confirmed support for an environmental impact assessment required for the project.</li> </ul>
Consultative Meeting 5	23-27 May 2016	Malem and Utwe communities of Kosrae – via the EIA process	<ul style="list-style-type: none"> <li>Concerns were raised by the Utwe community over alternative road alignments through the Kuplu Wan plateau resulting in potential contamination of their water supply which is sourced from the Palusrik catchment due to: <ul style="list-style-type: none"> <li>1. The location of the road and construction resulting in increased sediments or other contaminants entering the Palusrik River and the Utwe water supply.</li> </ul> </li> </ul>

			<ul style="list-style-type: none"> <li>• 2. The improved access to the Kuplu Wan area created by the road subsequently leading to increased development in the Kuplu Wan area, including land clearing, septic tanks, pig pens etc., resulting in increased potential for contamination of the Utwe water supply.</li> <li>• The alignment of the road through the southern part of the Kuplu Wan plateau (Palusrik catchment) has been re-aligned to ease community concerns on potential impacts on Utwe village's water supply. This results in a minimum buffer of 150 m at the watershed between the two catchments and over 350 m for the majority of the section of inland road within the Palusrik catchment. Given the distance to the Palusrik River, the only perennial stream in the catchment and the characteristics of the likely catchment drainage pathways, there is unlikely to be any impact from the construction or operation of the road itself on Utwe's water supply.</li> </ul>
Follow Up Meeting 3.1	20 June 2016	Vice President FSM, DFA, ODA, OEEM; US Embassy	<ul style="list-style-type: none"> <li>• Brief update of the proposal – appraisal stage</li> <li>• Letter confirming co-financing support pursued by national government at the November 2016 FSM Development Partner's Forum Meeting</li> </ul>
Follow Up Meeting 3.2 – SPREP Appraisal phase	21 June 2016	Lieutenant Governor Cabinet members IPIC Mayors of Malem and Utwe and Municipal Government representatives Malem Community, landowners	<ul style="list-style-type: none"> <li>• Brief update of the proposal</li> <li>• Support to development of the proposal to SPREP provided by the USAID ADAPT Asia-Pacific Project</li> <li>• National government acknowledgement of endorsement by Kosrae State of the Malem-Utwe road under the AF proposal as one of the top two priorities of infrastructure requiring immediate support for implementation</li> <li>• Re-affirmation of the priorities of the project by the Utwe Municipal government, women, men, elders, and youth of the community of Malem</li> </ul>
Follow Up Meeting 3.3	22 June 2016	Director and staff, KIRMA Director and staff, DTI IPIC and ODA	<ul style="list-style-type: none"> <li>• Brief update of the proposal</li> <li>• Support to development of the proposal to SPREP provided by the USAID USADAPT Asia-Pacific Project</li> <li>• IPIC, ODA acknowledgement of endorsement by Kosrae State of the</li> </ul>

		Utwe Community and landowners	<p>Malem-Utwe road under the AF proposal as one of the top two priorities of infrastructure requiring immediate support for implementation</p> <ul style="list-style-type: none"> <li>• Re-affirmation of the priorities of the project by the Utwe Municipal government, women, men, elders, youth, landowners of the community of Utwe</li> </ul>
Site Visit	23 June 2016	Malem-Yeseng-Utwe inland road, access routes, ADB Utwe Water Reservoir, Kuplu Wan plateau where road will access, coastal points Paal and Mosral, settlement areas, upland areas	<ul style="list-style-type: none"> <li>• Visited Palusrik catchment in Utwe municipality</li> <li>• Visited inland roads that are accessible of the Malem-Utwe inland road stretch, including Kuplu Wan plateau</li> <li>• Visited all access routes coastal-inland</li> <li>• Visited PACC Tafunsak climate-proof road</li> </ul>

## Annex 4: Proposed changes in project results framework – justification by SPREP

### (i) DATA SHEET

*Enhancing the climate change resilience of vulnerable island communities in Federated States of Micronesia*

<b>(ii) Basic Information</b>						
Project ID:	FSM/RIE/Coastal/2015/1	Financing Instrument:	Grant			
Director General:	Kosi Latu	Original ESS Category:	Partial Assessment (B)			
Task Manager:	Filomena Nelson	Current ESS Category:	Full Assessment (B)			
		Original Approval Date:	March 17, 2017			
		Current Closing Date:	March 13, 2023			
Implementing Agency:	Secretariat of the Pacific Regional Environment Programme (SPREP)					
Executing Agency:	Department of Environment, Climate Change and Emergency Management (DECEM)					
<b>Restructuring Type</b>						
Form Type:	Full Restructuring Paper					
Decision Authority:	Director General, SPREP					
<b>Financing (as of 30 November 2019)</b>						
Key Dates						
Status	Approval Date	Signing Date	Start Date	Original Closing Date	Revised Closing Date	
Effective	March 17, 2017	2017	March 13, 2018	March 13, 2023	December 31, 2023	
Disbursements (USD)						
Status	Original	Revised	Cancelled	Disbursed	Undisbursed	% Disbursed
Effective	9,000,000	9,000,000	0	1,248,486	7,751,514	13.87
<b>A. Summary of Proposed Changes</b>						
The proposed changes are:						

- (i) To revise the Project logframe including objectives, outcomes, outputs and activities to accurately and clearly identify core actions to be undertaken within each of the four components; strengthening policy and institutional capacity, water security and sanitation measures, the Kosrae inland road relocation and the knowledge management components of the Project. The revised logframe ensures the Project can achieve the end-of-project results within the revised timeframe and budget.
- (ii) To revise the Project Results Framework to reflect the changes to the logframe. The revised framework ensures the Project responds to the Adaptation Fund Results Framework and reflects indicators and targets aligned to the logframe.
- (iii) To revise the Project budget to align accordingly with the implementation of the activities and to ensure the activities are correctly funded. The disbursement budget will be realigned accordingly and will require amendments to the project procurement plan.
- (iv) To revise the Project completion date in-line with delays in the commencement of project implementation and the challenges the Executing Agency has faced in carrying out the original project plan.

Change in Implementing Agency	Yes [ ]	No [ X ]
Change in Executing Agency	Yes [ ]	No [ X ]
Change in Project's Development Objectives	Yes [ ]	No [ X ]
Change in Results Framework	Yes [ X ]	No [ ]
Change in Safeguard Policies Triggered	Yes [ ]	No [ X ]
Change of EA category	Yes [ ]	No [ X ]
Other changes to Safeguards	Yes [ ]	No [ X ]
Changes to Legal Covenants	Yes [ X ]	No [ ]
Change in Closing Date(s)	Yes [ X ]	No [ ]
Cancellations Proposed	Yes [ ]	No [ X ]
Change to Financing Plan	Yes [ X ]	No [ ]
Change in Disbursement Arrangements	Yes [ X ]	No [ ]
<b>Reallocation between Disbursement Categories</b>		
Change in Disbursement Estimates	Yes [ X ]	No [ ]
Change to Components and Costs	Yes [ X ]	No [ ]
Change in Institutional Arrangements	Yes [ ]	No [ X ]
Change in Financial Management	Yes [ X ]	No [ ]
Change in Procurement	Yes [ X ]	No [ ]

Change in Implementation Schedule	Yes [ X ]	No [ ]
Other Change(s)	Yes [ X ]	No [ ]

## B. Project Status

The project was approved at the 29<sup>th</sup> Adaptation Fund Board Meeting (16-17 March 2017) and became effective on June 22, 2017 with the signing of the Head Agreement between the Adaptation Fund and the Secretariat of the Pacific Regional Environment Programme (SPREP). The Project is scheduled to close on September 30, 2022.

The Implementing Agency undertook a supervisory mission to the Federated States of Micronesia from October 21-25, 2019. The objectives of the mission were to: (a) review progress on the FSM AF project including a review of implementation progress on all components since commencement of the project; (b) consult with stakeholders on the proposed Kosrae road development; (c) review the project plan and progress to identify actions and solutions to address the challenges and issues the executing agency is facing in implementation.

The October mission determined progress towards the achievement of the Project's Objective by the Executing Agency was "*Satisfactory*" however, a number of issues were highlighted relating to the original project plan and budget unduly impacting upon the effective implementation of the activities and achievement of the project objective and results framework.

In particular, implementation of the project has been challenging due to:

- Project design:** The original project design aimed at achieving the Project Objective is ambitious in scope and scale leading to outputs and activities being underfunded. The broad scope of activities is to be implemented across a scale including six outer islands in Yap, Chuuk and Pohnpei, the state of Kosrae and at the National level. The design does not sufficiently consider the complex political environment of the Federated States of Micronesia including responsibilities for decision-making at the National and State levels into the implementation of activities (i.e. Component 1 Strengthening policy and institutional capacity for integrated coastal and water management at national, state levels and outer island levels and Component 2 Demonstration of water security measures in outer islands of Yap, Chuuk and Pohnpei). Furthermore, the design has not considered the geographical and cultural challenges and aligned this to realistic financing of activities.

- **Financial constraints:** There are a number of financial challenges linked to the original costings and financing of activities. Activities have been costed out without due consideration to the challenging geographical environment of the outer islands of Yap, Chuuk and Pohnpei which impacts upon the financing required to undertake stakeholder consultations, transport materials and equipment and implement the on-ground activities. Furthermore, the original financing mechanism did not take into account implementation phasing to ensure activities were sufficiently funded when required. For example, the financing mechanism allocates yearly funding across the life-of-project against each activity, rather than financing specific activities upfront when they are being undertaken. This has a flow-on effect as specific activities are required to be completed prior to the commencement of follow-on activities. The challenges with the financing mechanism including disbursement of funds is limiting the ability of the Implementing Agency and Executing Agency to effectively manage activities and project finances to meet the project objectives.
- **Geographical challenges:** FSM experiences many geographical challenges due to the remoteness of the outer islands of Pohnpei, Yap and Chuuk from the main island centres. Transportation for project staff to the outer islands and to transport materials and equipment is prohibitive and limited to charter flights and charter boats in many circumstances. The period required to organise the transportation is lengthy and is limited to availability of craft. The financing of these elements has not been adequately accounted for in the original project budget. Additionally, these geographical challenges need to be considered in the workplan timelines and budgets for activities.
- **Delays in establishing the Project Management Unit:** Delays in procuring the project management unit personnel has led to delays in implementation of activities. In particular, the Project Manager was not recruited until October 2018 and subsequent recruitment of staff for the PMU was completed post this appointment. Whilst the Project Management Unit is now fully staffed, this has led to delays in undertaking activities as per the original workplan timelines.

Lastly, the mission determined: (i) the Project would not be able to achieve the Project Objectives before the Project closing date and; (ii) revisions would be needed to be made to the project logframe to reflect changes to the scale and scope of the project which would ensure implementation could be successfully achieved within the revised timeframe and financing.

## C. Proposed Changes

### Project Objectives / Results

#### Project Development Objectives

##### Original PDO

To reduce the vulnerability of the selected communities to risks of water shortage and increase adaptive capacity of communities living in Woleai, Eauripik, Satawan, Lukunor, Kapingamarangi, Nukuoro, Utwe and Malem to drought and flood-related climate and disaster risks.

The PDO remains unchanged.

#### Changes to the Results Framework

##### Explanation:

The Results Framework requires modification from the original Framework to ensure consistency with the revised logframe and to ensure the Project is correctly responding to the Adaptation Fund's Results Framework. Modifications include:

- (i) AF Results Framework has been updated to reflect the correct Fund outcome and output indicators which the Project responds to;
- (ii) The Project Strategic Results Framework has been updated to ensure consistency with the revised Project Logframe;
- (iii) Indicators and targets have been updated to reflect the Project's objectives, activities and beneficiaries.

The revised Results Framework is available in Annex 1.

### Project Logframe

#### Changes to the Project Logframe

##### Explanation:

The Project logframe has been revised to reflect the challenges and constraints facing the implementation of the project as outlined in Section B Project Status and as per the detailed accounting of changes indicated under each of the Component summaries in this section. The revised logframe is below in Table 1.

**Table 1: Revised Project Logframe**

Project Objective	Component	Outcome	Output	Activities
<p><b>Project Objective 1:</b> Prepare the necessary institutional and regulatory frameworks, policies, guidance and tools to help deliver a climate resilient FSM</p>	<p><b>Component 1:</b> Strengthening policy and institutional capacity for integrated coastal and water management at national, state levels and outer island levels</p>	<p><b>Outcome 1:</b> Strengthened policy and institutional capacity of government to integrate climate risk and resilience into its water and coastal and marine management legislative, regulatory and policy frameworks</p>	<p><b>Output 1.1:</b> Legislation and policy paper to guide regulation of climate resilient coastal and marine management at national level</p>	<p>Activity 1.1.1: Review of National-level legislation and policies for (i) infrastructure to identify climate change requirements and (ii) regulatory and policy framework for climate change</p>
			<p><b>Output 1.2:</b> State regulations for coastal and marine development projects amended to consider climate change risks and resilience measures</p>	<p>Activity 1.1.2: Develop guidance based on recommendations from the review of coastal and marine management legislation and policy and monitor progress of recommendation uptake through relevant Departments</p>
			<p><b>Output 1.3:</b> State Water Outlook and Water Sector Investment Plan developed and implemented</p>	<p>Activity 1.2.1: Review of State-level legislation and policies for infrastructure to identify climate change requirements</p> <p>Activity 1.2.2: Develop guidance based on recommendations from the review of coastal and marine management legislation and policy) and monitor progress of recommendation uptake through relevant</p>
			<p>Activity 1.3.1: Support the implementation of State-level Water Outlook and Investment Plans</p>	

Project Objective	Component	Outcome	Output	Activities
<b>Project Objective 2:</b> Strengthen water and livelihood security measures to help 6 outer atoll islands adapt to impacts of climate change related to water, health and sanitation	<b>Component 2:</b> Demonstration of water security and sanitation measures in outer islands of Yap, Chuuk and Pohnpei	<b>Outcome 2a:</b> Water conservation and management technology and practices adopted, responding to drought, sea level rise and early recovery from cyclones	<b>Output 2.1:</b> Outer island communities oriented to CC, SLR, and adaptive capacity measures involving water, health, sanitation and environment	Activity 2.1.1: Arrangements for demonstrations of water technologies
			<b>Output 2.2:</b> Water Harvesting and Storage System (WHSS) repaired and installed in 6 atoll islands	Activity 2.2.1: Carry out ground-truthing assessments
		Activity 2.2.2: Repairing household rainwater harvesting and storage system		
		Activity 2.2.3: Constructing community rainwater harvesting and storage systems		
Activity 2.2.4: Implementation of a monitoring and maintenance programme				
<b>Outcome 2b:</b> Appropriate sanitation measures for the outer islands of Yap, Chuuk and Pohnpei are determined for future investment	<b>Output 2.3:</b> Assessment of viable sanitation measures for outer islands in Yap, Chuuk and Pohnpei	Activity 2.3.1: Sanitation measures assessed and piloted in outer islands in Yap, Chuuk and Pohnpei		
<b>Project Objective 3:</b> Provide communities with climate resilient infrastructure to help	<b>Component 3:</b> Demonstration of Kosrae Inland Road Relocation Initiative	<b>Outcome 3:</b> Increased resilience of coastal communities and environment	<b>Output 3.1:</b> Malem - Utwe inland road and access routes designed for future construction	Activity 3.1.1: Survey and design road and related infrastructure to ensure climate change resilience

<b>Project Objective</b>	<b>Component</b>	<b>Outcome</b>	<b>Output</b>	<b>Activities</b>
relocate from high risk coastal inundation sites		to adapt to coastal hazards and risks induced by climate change	<b>Output 3.2:</b> Transitional coastal protection at Mosral and Paal upgraded for immediate coastal protection	Activity 3.2.1: Upgrade coastal protection works
<b>Project Objective 4:</b> Capture and share the local knowledge produced on climate change adaptation and accelerate the understanding about the kinds of interventions that work in island environments in FSM	<b>Component 4:</b> Knowledge management for improved water and coastal protection	<b>Outcome 4:</b> Capacity and knowledge enhanced and developed to improve management of water and coastal sectors to adapt to climate change	<b>Output 4.1:</b> Resource materials developed, tailored to local context, translated, published and shared amongst various stakeholders	Activity 4.2.1: Undertake knowledge management, communication and engagement activities
				Activity 4.2.2: Capture and document data and information generated by the project

### Details of revisions against each Component

**Component 1:** Strengthening policy and institutional capacity for integrated coastal and water management at national, state levels and outer island levels

**Explanation:**

Component 1 outputs and activities have been amended to provide greater clarity on Project undertakings in strengthening the policy and institutional capacity at the national, state and outer island levels of government. In particular, the original project plan was ambitious in identifying what the project could achieve within the National and State political boundaries and decision-making processes, limited finances and the project timeframe e.g. the plan outlined the development, endorsement and adoption of policies and legislative changes at national, state and outer islands levels. The plan has been amended to streamline the requirements under this project within budgetary constraints, whilst still meeting core goals in strengthening policy and institutional capacity to undertake coastal and water management across the different political scales. Specifically, the revised plan prioritises a review of the national and state legislation and policy on water and coastal management and undertaking the development of State water outlooks and water sector investment plans. This focus acknowledges the decision-making on these issues is undertaken at the state level rather than at the national level.

Changes reflected against the original component, outcome, outputs and activities are provided below.

Original Component	Revised Component
Strengthening policy and institutional capacity for integrated coastal and water management at national and state levels	Strengthening policy and institutional capacity for integrated coastal and water management at national, state levels <b>and outer island levels</b>
Original Outcome(s)	Revised Outcome(s)
Outcome 1: Strengthened policy and institutional capacity of government to integrate climate risk and resilience into its water and coastal management legislative, regulatory and policy frameworks	Outcome 1: Strengthened policy and institutional capacity of government to integrate climate risk and resilience into its water and coastal <b>and marine</b> management legislative, regulatory and policy frameworks

<b>Output(s)</b>			<b>Activities</b>		
<b>Original</b>	<b>Proposed</b>	<b>Explanation</b>	<b>Original</b>	<b>Proposed</b>	<b>Explanation</b>
Output 1.1: Legislation and policy paper to guide regulation of climate resilient coastal and marine management at national level	Output 1.1: Legislation and policy paper to guide regulation of climate resilient coastal and marine management at national level	No change	Activity 1.1.1: Review of legislation and policies for infrastructure to identify climate change requirements	Activity 1.1.1: Review of National-level legislation and policies for (i) infrastructure to identify climate change requirements and (ii) regulatory and policy framework for climate change	Activity has been updated to streamline the previous Activity 1.1.1 and 1.1.2 into one activity reviewing both infrastructure policy and the climate change regulatory and policy framework.
			Activity 1.1.2: Regulatory and policy framework for climate change at national level	Activity 1.1.1: Review of National-level legislation and policies for: (i) infrastructure to identify climate change requirements and (ii) regulatory and policy framework for climate change	This activity has been combined into Activity 1.1.1.
			Activity 1.1.3: Develop policy and guidance documents for national and states	Activity 1.1.2: Develop guidance based on recommendations from the review of coastal and marine management legislation and policy and monitor progress of recommendation uptake through relevant Departments	The activity has been amended to reflect the FSM political environment and acknowledged the Project can only develop guidance based on recommendations. Development of regulations and policies can only be undertaken by the Government Ministries.
			Activity 1.1.4: Endorse and adopt regulations,	Cancelled	The timeframe of the Project is not feasible to develop, endorse

			policy and guidance documents established for national and state levels		and adopt regulations given the complex FSM National and State political structure.
			Activity 1.1.5: Lobby and advocate regulation and policy changes in media campaign and public awareness activities	Cancelled	The Project can provide support towards the development of policies and regulations, however, responsibility for implementation remains with the appropriate Department at National or State level
			Activity 1.1.6: Monitor and report feedback and progress	Cancelled	This is now incorporated into the Project's M&E and reporting programme
Output 1.2: State regulations for development projects amended to consider climate change risks and resilience measures	Output 1.2: State regulations for development projects amended to consider climate change risks and resilience measures	No change	Activity 1.2.1: Consultations and regulations at state level – Yap, Chuuk and Pohnpei	Activity 1.2.1: Review of State-level legislation and policies for infrastructure to identify climate change requirements	The activity has been amended to reflect the State-level legislation and policies with clear linkages to infrastructure policy
			Activity 1.2.2: Develop, endorse and adopt regulatory framework on development projects at state level	Cancelled	The timeframe of the Project is not feasible to develop, endorse and adopt regulations given the FSM State political structure.
			Activity 1.2.3: Initiate development of regulations, policy and guidance documents identified and adopt institutional changes to existing arrangements	Activity 1.2.2: Develop guidance based on recommendations from the review of coastal and marine management legislation and policy) and monitor progress of recommendation uptake through relevant	The activity has been amended to reflect the FSM political environment and acknowledged the Project can only develop guidance based on recommendations. Development of regulations and policies can only be undertaken by the Government Ministries.

			Activity 1.2.4: Endorse and adopt regulations, policy and guidance documents established for national and state	Cancelled	The timeframe of the Project is not feasible to develop, endorse and adopt regulations given the FSM National and State political structure.
			Activity 1.2.5: Lobby and advocate regulation and policy changes through media campaigns and public awareness activities	Cancelled	The Project can provide support towards the development of policies and regulations, however, responsibility for implementation remains with the appropriate Department at National or State level.
			Activity 1.2.6: Monitor and report feedback and progress	Cancelled	This is incorporated into the Project's M&E and reporting programme
Output 1.3: National Water and Sanitation Policy endorsed with climate and disaster risks and resilience, and gender mainstreamed	Output 1.1: Legislation and policy paper to guide regulation of climate resilient coastal and marine management at national level	Incorporated into Output 1.1. The current political situation at the National level highlights a number of challenges with identifying who has overarching responsibility in this area. It is currently being explored by the National Government	Activity 1.3.1: Review the water policy framework to incorporate gender and climate change	Activity 1.1.1: Review of National-level legislation and policies for (i) infrastructure to identify climate change requirements and (ii) regulatory and policy framework for climate change	The review under Activity 1.1.1 will consider the water policy framework and provide recommendations for the National Government to consider.
			Activity 1.3.2: Preparation of the National Water and Sanitation Policy (NWSP)	Cancelled	This activity has been cancelled as there are a number of factors influencing the Policy which need to be determined firstly by the National Government.
Output 1.4: National Water Outlook and Water Sector Investment Plan	Output 1.3: State Water Outlook and Water Sector Investment (WOWSI)	The output has been amended to State WOWSI Plans to reflect	Activity 1.4.1: Implementation of the National Water Outlook Program	Activity 1.3.1: Support the implementation of State-level Water Outlook and Investment Plans (WOIP)	Activity has been amended to reflect the Project will support the State level WOIP. The Project is not able to implement as this is

developed and implemented	Plan developed and implemented	the State's role in water resource management.			the responsibility of the National and State Governments.
			Activity 1.4.2 Implementation of the WSIP Program	Cancelled	As above

**Component 2.** Demonstration of water security and sanitation measures in outer islands of Yap, Chuuk and Pohnpei

Explanation:

Proposed changes to Component 2 are designed to recognise both water security and sanitation measures within the outcomes, and to better align the outputs and activities with these outcomes. The changes relate to the inclusion of an outcome specifically on sanitation measures and cancellation of Outcome 2b on increasing climate change awareness through formal climate education.

The remit of this outcome in its original state was overly ambitious and did not consider the roles and responsibilities of the FSM Departments (i.e. Department of Education), the length of time to incorporate new curriculum into schools and the viability of this project to both develop the Guide, curriculum and train teachers in the use of the Guide or the technicalities of these proposed activities. This activity has been cancelled under the prioritisation exercise to determine what can be best achieved within the Project’s mandate, timeframe and budget.

Proposed changes are outlined below.

<b>Original Component</b>	<b>Revised Component</b>
Demonstration of water security measures in outer islands of Yap, Chuuk and Pohnpei	Demonstration of water security <b>and sanitation measures</b> in outer islands of Yap, Chuuk and Pohnpei
<b>Original Outcome(s)</b>	<b>Revised Outcome(s)</b>
Outcome 2a: Water conservation and management technology & practices adopted, responding to drought, sea level rise and early recovery from cyclones	Outcome 2a: Water conservation and management technology & practices adopted, responding to drought, sea level rise and early recovery from cyclones
n/a	Outcome 2b: Appropriate sanitation measures for the outer islands of Yap, Chuuk and Pohnpei are determined for future investment
Outcome 2b: Increased awareness of climate change through formal climate education	Cancelled due to a lack of integration into the project outcomes overall and budgetary constraints.

<b>Output(s)</b>			<b>Activities</b>		
<b>Original</b>	<b>Proposed</b>	<b>Explanation</b>	<b>Original</b>	<b>Proposed</b>	<b>Explanation</b>
Output 2.1: Outer island communities oriented to CC, SLR, and adaptive capacity measures involving water, health, sanitation and environment	Output 2.1: Outer island communities oriented to CC, SLR, and adaptive capacity measures involving water, health, sanitation and environment	No change	Activity 2.1.1: Arrangements for demonstrations of water and sanitation technologies	Activity 2.1.1: Arrangements for demonstrations of water technologies	Minor change separating water from sanitation as sanitation is covered under Output 2.3
Output 2.2: Water Harvesting and Storage System (WHSS) repaired and installed in 6 atoll islands	Output 2.2: Water Harvesting and Storage System (WHSS) repaired and installed in 6 atoll islands	No change	Activity 2.1.2: Carry out ground-truthing assessments	Activity 2.2.1: Carry out ground-truthing assessments	No change
			Activity 2.2.1: Repairing household rainwater harvesting and storage system	Activity 2.2.2: Repairing household rainwater harvesting and storage system	No change
			Activity 2.2.2: Constructing community rainwater harvesting and storage systems	Activity 2.2.3: Constructing community rainwater harvesting and storage systems	No change
			Activity 2.2.3: Monitoring and maintenance	Activity 2.2.4: Implementation of a monitoring and maintenance programme	Change to numbering and the activity name has been amended to provide greater clarity
Output 2.3: Self Composting Waterless Toilets constructed to conserve water, improve soil	Output 2.3: Assessment of viable sanitation measures for outer islands in Yap, Chuuk and Pohnpei	Lessons from projects in the Pacific region highlight SCT are not viable options in outer islands. The output has	Activity 2.3.1: Developing plans/ guidelines for self-composting water less toilets (SCT)	Activity 2.3.1: Sanitation measures assessed and piloted in outer islands in Yap, Chuuk and Pohnpei.	This activity(ies) has been amended to reflect the lessons learned from similar projects in the Pacific region illustrating SCT are not necessarily viable from a

environment, and reduce marine eutrophication on the lagoon side		been amended to illustrate the need to undertake an assessment on the outer islands to ascertain what may be viable both culturally and technologically in these remote, geographical locations	awareness, installation and maintenance		technological or cultural perspective. The revised activity will undertake an assessment of what will be appropriate for these outer islands prior to installation of any agreed-to options with the communities. The options will be piloted and evaluated prior to any larger-scale implementation.
			Activity 2.3.2: Constructing self-composting toilets – using plans (1 unit each per gender)	Activity 2.3.1: Sanitation measures assessed and piloted in outer islands in Yap, Chuuk and Pohnpei.	
			Activity 2.3.3: Training on WASH and water conservation practices in school and communities	Activity 2.3.1: Sanitation measures assessed and piloted in outer islands in Yap, Chuuk and Pohnpei.	
			Activity 2.3.4: Monitoring and after care	Incorporated into Activity 2.3.1.	
Output 2.4: 3, 253 people trained on water conservation and management including coastal protection and livelihoods in 6 outer islands	Cancelled	Output 2.4 duplicates the intentions under Output 2.1 and has been removed	No specific activity indicated in original project document	The output / activity has been incorporated into Output 2.1.	Output has been deleted as it is duplicated under Output 2.1.
Output 2.5 Teacher's Guide on Climate Change developed to improve climate change learning in FSM schools and training institutions	Cancelled	Refer to explanation in main body	Activity 2.5.1: Organizing climate change education planning workshops	Cancelled	Refer to the details provided in the component explanation
			Activity 2.5.2: Teacher's Guide on Climate Change translated in six outer island languages	Cancelled	
			Activity 2.5.3: Training of Trainers / Teachers on Teacher's Guide on Climate Change	Cancelled	

			Activity 2.5.4: Implement Teacher's Guide in Schools	Cancelled.	
			Activity 2.5.5: Monitoring effectiveness of Teacher's Guide development system, and Guide itself	Cancelled.	

### **Component 3. Demonstration of Kosrae Inland Road Relocation Initiative**

#### **Explanation:**

Component 3 comprises two core outputs: (i) the Kosrae inland road relocation (Output 3.1) and (ii) Transitional coastal protection at Mosral and Paal upgraded for immediate coastal protection (Output 3.2). Outputs 3.3, 3.4 and 3.5 are supplementary to Output 3.1.

The Kosrae Shoreline Management Plan developed a prioritised list of inland road and essential infrastructure development for developing resilience to coastal-related hazards and sustained adaptation to climate change. Developing and upgrading 3.6 miles (5.8 km) of inland road up to an unsealed rural road standard (sub-base standard) between Malem and Utwe was considered the highest priority due to the current threats posed to vulnerable populations and infrastructure due to wave overwashing and potential breaching of the narrow coastal berm upon which present infrastructure and much of the population of Utwe and Malem Municipalities are located.

In mid-2019, the Implementing Agency (SPREP) contracted an Environmental and Social Safeguards Specialist to conduct an environmental and social safeguards assessment and develop an Environmental and Social Safeguards Plan (ESMP). This requirement had not been undertaken during the project planning phase. The ESM Plan outlines a number of environmental and social risks associated with the construction of the road and provides mitigation actions to be undertaken. The mitigation activities require budgetary inputs which are beyond the capacity of the Project to fund under the current funding levels.

The preliminary road design report and presentation from the consultants engaged by the project also highlighted a number of issues with the proposed road for Kosrae and provides recommendations to strengthen the design and construction phases which have budgetary impacts.

The mission undertook a series of consultations with stakeholders culminating in an agreement that the current budget allocated to this Component is not sufficient to undertake the activities under Component 3 to a satisfactory standard which is required.

In light of the ESM Plan and the preliminary road design report, the project will:

- a. Prioritise the road design, ensuring the design meets best standards and incorporating additional design elements as agreed to during the stakeholder consultations. These include:
  - i. The road design and construction is to be extended from the original 3.6 miles of priority sections of upgraded road (i.e. Malem to Pilyuul (Section 3), Malem to Utwe (Section 2) and Utwe (Section 1)) to 5.53 miles which will include the road in its entirety (refer Figure 1) and an additional access road.
  - ii. The road surface is to be upgraded from the gravel sub-base to asphalt to accommodate the adaptation requirements (i.e. 50 years life span) and erosion and runoff concerns.
  - iii. The road lane width is to be reduced from 12 feet to 10 feet per lane, ensuring consistency with FSM standards for road width.
  - iv. The design is to include all earthworks, retaining walls and erosion considerations to meet the best standards and to reduce the environmental impacts due to the steep alignment of the road.
  - v. The design is to incorporate areas of historical and cultural importance to ensure these are avoided.
  - vi. The right-of-ways are to be provided to EMPSCO for incorporation into the road design.
  - vii. The mitigation actions detailed in the Environmental and Social Safeguards Plan are to be incorporated into both the design and construction phases as appropriate for each phase.
  - viii. The design and construction phases should include all utilities and scoping / design work on this will need to be tendered.
- b. Cancel the construction of the road due to budgetary constraints, with funding to be obtained from other avenues.
- c. Prioritise the coastal protection works for Mosral and Paal (Output 3.2).
- d. Cancel Outputs 3.3, 3.4 and 3.5 due to funding constraints, timeframes and their linkages to the road construction.

The list of proposed changes is outlined below.

Original Component	Revised Component
--------------------	-------------------

Demonstration of Kosrae Inland Road Relocation Initiative	Demonstration of Kosrae Inland Road Relocation Initiative
<b>Original Outcome(s)</b>	<b>Revised Outcome(s)</b>
Outcome 3: Increased resilience of coastal communities and environment to adapt to coastal hazards and risks induced by climate change	Outcome 3: Increased resilience of coastal communities and environment to adapt to coastal hazards and risks induced by climate change

<b>Table 4. Component 3 original and proposed outputs and activities</b>					
<b>Output(s)</b>			<b>Activities</b>		
<b>Original</b>	<b>Proposed</b>	<b>Explanation</b>	<b>Original</b>	<b>Proposed</b>	<b>Explanation</b>
Output 3.1: 3.6 miles (5.8 km) of Malem-Utwe inland road and access road routes constructed to sub-base roading standard for future relocation	Output 3.1: Malem - Utwe inland road and access routes designed for future construction	The output has been updated to reflect outcomes from the mission for the Project to focus on the development of a road design	Activity 3.1.1: Survey, design, construction, reconstruction and maintenance of road and related infrastructure to ensure climate change resilience	Activity 3.1.1: Survey and design road and related infrastructure to ensure climate change resilience	The activity has been amended to the road design only and reflects realistic timelines and budgets as per the supervisory mission findings.
Output 3.2: Transitional coastal protection at Mosral and Paal upgraded for immediate coastal protection	Output 3.2: Transitional coastal protection at Mosral and Paal upgraded for immediate coastal protection	No change	Activity 3.2.1: Coastal protection works	Activity 3.2.1: Upgrade coastal protection works	No change
Output 3.3: State support program to access land in upland areas established	Cancelled	These outputs have been cancelled. The project budget and timeframe does not enable these activities to be effectively undertaken. Furthermore, these activities are linked to the construction of the road which is not possible within the financial constraints of this component. It is proposed the project timeframe and budget	Activity 3.3.1: Land consultations, surveys, mapping and regulatory framework for future inland movement of vulnerable coastal people and infrastructure	Cancelled	Activities have been cancelled as per explanation against the output.
Output 3.4: Community-Based Ecosystem Management strengthened	Cancelled		Activity 3.4.1: Palusrik / Kuplu Wan watershed protection strategy, native vegetation buffer zones and stream health monitoring	Cancelled	

		can only undertake the road design.	program to strengthen sustainable use of upland areas		
Output 3.5: State support program to assist accessing finance for vulnerable households established	Cancelled		Activity 3.5.1: Preparation of support program for accessing finance	Cancelled	

**Component 4.** Knowledge management for improved water and coastal protection

**Explanation:**

Component 4 involves the knowledge management and communication activities of the Project. The original project plan incorporated the development of Municipality Development Plans for the outer islands i.e. eight strategic plans are to be developed for the communities of Woleai (Yap), Eauripik, Satawan, Lukunor (Chuuk), Nukuoro, Kapingmarangi (Pohnpei), Malem and Utwe (Kosrae). The plans are to act as the climate and disaster resilience plans to integrate all of the sector plans.

During the mission it was agreed this activity was not suitable for this Component and would be more appropriate to be included in Component 1 Strengthening policy and institutional capacity for integrated coastal and water management at national, state levels and outer island levels. However, further review of the overall plan and budget has highlighted budgetary constraints in being able to undertake this activity. It is therefore recommended for cancellation and to be considered in future funding.

Other proposed changes to this Component include numbering changes to activities and removal of outputs (i.e. Output 4.3) whereby it is a duplication of effort under a previous output and the removal of activities (i.e. Activity 4.2.2) as the activity does not reflect the mandate of this project.

The proposed amendments are outlined below.

<b>Original Component</b>	<b>Revised Component</b>
Knowledge management for improved water and coastal protection	Knowledge management for improved water and coastal protection
<b>Original Outcome(s)</b>	<b>Revised Outcome(s)</b>
Outcome 4: Capacity and knowledge enhanced and developed to improve management of water and coastal sectors to adapt to climate change	Outcome 4: Capacity and knowledge enhanced and developed to improve management of water and coastal sectors to adapt to climate change

<b>Output(s)</b>			<b>Activities</b>		
<b>Original</b>	<b>Proposed</b>	<b>Explanation</b>	<b>Original</b>	<b>Proposed</b>	<b>Explanation</b>
Output 4.1: Community resilient (Municipality) Development Plans developed and communicated	Cancelled	The output has been cancelled due to budgetary constraints requiring prioritisation of activities	Activity 4.1.1: Organizing development of Island / Municipal Government Development Plan	Cancelled	The activities have been cancelled due to budgetary constraints requiring prioritisation of activities
			Activity 4.1.2: Implement institutional changes to existing arrangements and establish effective communications based on new/ revised Plan and communications strategy	Cancelled	
			Activity 4.1.3: Share and disseminate Plan to partners and stakeholders	Cancelled	

Output 4.2: Resource materials developed, tailored to local context, translated, published and shared amongst various stakeholders	Output 4.1: Resource materials developed, tailored to local context, translated, published and shared amongst various stakeholders	No change	Activity 4.2.1: Capture and document data and information generated by the project	Activity 4.2.2: Capture and document data and information generated by the project	Change to the activity number
			Activity 4.2.2: Organizing consultancy support to edit scientific and peer reviewed knowledge products from the project	Cancelled	This activity is not appropriate: (i) this is an action towards achieving an activity and not an activity in itself; (ii) the project is not a research project and will not be publishing in scientific literature.
			Activity 4.2.3: Print, publish, produce and share materials through public awareness and media campaigns	Activity 4.2.1: Undertake knowledge management, communication and engagement activities.	Activity numbering has been amended to reflect new numbering. Name of the activity has been amended to better reflect all aspects of the knowledge management activity and is not limited to producing materials.
Output 4.3: Stakeholders brought together to share, learn and exchange knowledge and skills on climate change, adaptation	Cancelled	Output 4.3 has been removed as it is a duplication of Output 2.1: Outer island communities oriented to CC, SLR, and adaptive capacity measures	Activity 4.3: Trainings on climate change, sea level rise and adaptive capacity measures on water and coastal sectors	Cancelled	Activity 2.1.1: Arrangements for demonstrations of water and sanitation technologies envelops activities under this Output.

planning, monitoring, vulnerability assessments and climate change		involving water, health, sanitation and environment			
--	--	---	--	--	--

**(iii) Annex 1b. Revised Project Strategic Results Framework**

Outcome / Outputs	Indicator	Baseline	Target	Source of Verification	Assumptions and Risks
<b>Component 1: Strengthening policy and institutional capacity for integrated coastal and water management at national, state levels and outer island levels</b>					
<p><b>Outcome 1:</b> Strengthened policy and institutional capacity of government to integrate climate risk and resilience into its water and coastal and marine management legislative, regulatory and policy frameworks</p>	<p>Number of national and state level stakeholders participating in EPA, R&amp;D, NWTF meetings, planning and implementation of activities.</p> <p>Number of regulatory framework drafts developed for water and coastal management regulations at state level</p> <p>Two indicators have been removed</p>	<p>FSM regulations for development projects does not consider climate risks and resilience, with the exception of the Kosrae State Regulations for Development Projects 2014.</p> <p>Existing water and coastal management policies lack consideration of existing climate change risk and disaster risk, and projected risks.</p> <p>A framework for developing a water and sanitation policy, water outlook, and</p>	<p>13 strategies or plans reviewed or developed by end of Project.</p> <p>Old ones: At least two relevant regulatory frameworks endorsed and adapted to guide and support development of regulations on development projects at national and state level.</p> <p>Climate change is mainstreamed into the FSM National Water &amp; Sanitation Policy, Water Outlook Program, Water</p>	<p>Stakeholder consultation reports.</p> <p>Legal and regulatory policy assessment reports including recommendations.</p> <p>Guidance documents on mainstreaming climate change into legislative and policy frameworks.</p> <p>Policies or plans.</p> <p>Policies or legislation adopted highlighting the uptake of the guidance and recommendations.</p>	<p><b>Assumptions:</b> Political will and commitment to encourage participation of key government stakeholders at national level.</p> <p>Political will to adopt the guidance and recommendations within Departments.</p> <p><b>Risks:</b> Limited or no buy-in from national stakeholders.</p> <p>Change of Government and priorities.</p>

Outcome / Outputs	Indicator	Baseline	Target	Source of Verification	Assumptions and Risks
		water sector investment plan exists but no plans that integrate climate risks and consider gender-sensitive approaches.	Sector Investment Plan, national and state development projects.		
<p><b>Output 1.1:</b> Legislation and policy paper to guide regulation of climate resilient coastal and marine management at national level</p>	<p>National-level legislation and policies reviewed to incorporate climate change considerations into marine and coastal management.</p> <p>Guidance developed based on recommendations adoption of recommendations evident within relevant Departments.</p> <p>Old ones: Number of stakeholder organizations</p>	<p>No current and future climate risks mainstreamed into current legislation, regulation, policy and guidance documents for coastal and marine development projects in FSM.</p>	<p>At least one national coastal and marine management policy and legislation reviewed with recommendations and guidance developed on mainstreaming climate risk and resilience.</p> <p>Recommendations adopted by at least one Department.</p> <p>Old ones: A legislative framework to guide national level regulation of climate</p>	<p>Stakeholder consultation reports.</p> <p>Legal and regulatory policy assessment report including recommendations.</p> <p>Guidance documents on mainstreaming climate change into legislative and policy frameworks.</p> <p>Policies or legislation adopted highlighting the uptake of the guidance and recommendations.</p>	<p><b>Assumptions:</b> Political will and commitment to encourage participation of key government stakeholders at national level.</p> <p>Political will to adopt the guidance and recommendations within Departments.</p> <p><b>Risks:</b> Limited or no buy-in from national stakeholders.</p> <p>Change of Government and priorities.</p>

Outcome / Outputs	Indicator	Baseline	Target	Source of Verification	Assumptions and Risks
	<p>participating in legal and regulatory assessment meetings</p> <p>Number of regulation, policy and guidance documents drafted at national level</p>		<p>resilient coastal and marine resource management at national level.</p> <p>A national level regulation for development projects with climate risks and resilience incorporated developed, endorsed and adopted</p>		
<p><b>Output 1.2:</b> State regulations for coastal and marine development projects amended to consider climate change risks and resilience measures</p>	<p>State-level legislation and policies reviewed to incorporate climate change considerations into marine and coastal management.</p> <p>Guidance developed based on recommendations adoption of recommendations evident within relevant Departments.</p>	<p>No current and future climate risks mainstreamed into current legislation, regulation, policy and guidance documents for development projects in Yap, Chuuk and Pohnpei States.</p>	<p>At least one State coastal and marine management policy and legislation reviewed with recommendations and guidance developed on mainstreaming climate risk and resilience.</p> <p>Recommendations adopted by at least one Department. Old one:</p>	<p>Stakeholder consultation reports.</p> <p>Legal and regulatory policy assessment report including recommendations.</p> <p>Guidance documents on mainstreaming climate change into legislative and policy frameworks.</p> <p>Policies or legislation adopted highlighting the uptake of the</p>	<p><b>Assumptions:</b> Political will and commitment to encourage participation of key government stakeholders at national level.</p> <p>Political will to adopt the guidance and recommendations within Departments.</p> <p><b>Risks:</b></p>

Outcome / Outputs	Indicator	Baseline	Target	Source of Verification	Assumptions and Risks
	<p>Old ones: Number of stakeholder organizations participating regulatory framework workshops at state level</p> <p>Number of regulation, policy and guidance documents drafted at state level</p>		<p>At least one state has endorsed and adopted changes to its state regulation for development project that consider climate risks and resilience</p>	<p>guidance and recommendations.</p>	<p>Limited or no buy-in from national stakeholders.</p> <p>Change of Government and priorities.</p>
<p><b>Output 1.3:</b> National Water and Sanitation Policy endorsed with climate and disaster risks and resilience, and gender mainstreamed</p>	<p>Completion of the National Water and Sanitation Policy. Endorsement of the National Water and Sanitation Policy.</p> <p>Old ones: Number of stakeholders participating in N WTF meetings, planning and implementation of activities</p>	<p>No water and sanitation policy.</p>	<p>National Water and Sanitation Policy developed and ready for endorsement.</p> <p>Old one: NWSP with climate risks and resilience, and gender incorporated, is endorsed and adopted by a resolution of the President and Government of</p>	<p>Stakeholder consultation reports.</p> <p>National Water and Sanitation Policy. President and Government resolution on National Water &amp; Sanitation Policy</p>	<p><b>Assumptions:</b> Political will and commitment to developing a National WSP.</p> <p>Strong Government leadership and support for development of the WSP.</p> <p><b>Risks:</b> Limited or no buy-in from Government</p>

Outcome / Outputs	Indicator	Baseline	Target	Source of Verification	Assumptions and Risks
	<p>Number of women, men, and youth participating in gender and climate change trainings, meetings and public awareness activities</p> <p>Number of stakeholders (organizations) participating in NWSP awareness activities</p>		FSM (Four state endorsement)		and other stakeholders.
<p><b>Output 1.4:</b> State Water Outlook and Water Sector Investment Plan developed and implemented</p>	<p>Completion of the review and updates of the State Water Outlook and Water Sector Investment Plan.</p> <p>Implementation of State Water Outlook and Water Sector Investment Plans.</p> <p>Old ones: Number of women, men and youth and</p>	<p>No State Water Outlook and Water Sector Investment Plan in Yap, Chuuk and Pohnpei</p>	<p>State Water Outlook and Water Sector Investment Plans updated in 4 States.</p> <p>WOSWIP implemented in at least one State.</p> <p>Old ones: NWSP with climate risks and resilience, and gender incorporated, is</p>	<p>Stakeholder consultation reports.</p> <p>Water Outlook and Water Sector Investment Plans.</p>	<p><b>Assumptions:</b> Political will and commitment to updating the WOSWIPs.</p> <p>Strong State leadership and support for development of the WOSWIP.</p> <p>WOSWIP are already developed in all</p>

Outcome / Outputs	Indicator	Baseline	Target	Source of Verification	Assumptions and Risks
	<p>stakeholder organizations participating in NWTF meetings, planning and implementation of activities</p> <p>Number of stakeholder organizations participating and implementing water outlook programs</p> <p>Number of partnerships strengthened under the water sector investment plan</p>		<p>endorsed and adopted by a resolution of the President and Government of FSM (Four state endorsement)</p> <p>National Water Outlook Program endorsed adopted and implemented</p> <p>National Water Sector Investment Plan endorsed, adopted and implemented</p>		<p>States and require updating.</p> <p><b>Risks:</b> Limited or no buy-in from State government stakeholders.</p>
<b>Component 2: Demonstration of water security and sanitation measures in outer islands of Yap, Chuuk and Pohnpei</b>					
<b>Outcome 2a:</b> Water conservation and management technology and practices adopted, responding to	Number of outer islands and its communities with increased storage capacity to store potable and grey water	Poorly maintained traditional water harvesting and conservation infrastructure and technology available.	By end of project, at least five project islands and their communities have increased storage capacity to store	Participatory evaluation report, survey report progress report developed by Municipal	<b>Assumptions:</b> Household / Individuals accept the need to limit water usage

Outcome / Outputs	Indicator	Baseline	Target	Source of Verification	Assumptions and Risks
drought, sea level rise and early recovery from cyclones	<p>Number of people (disaggregated by GSI categories) benefitting from interventions by the project.</p> <p>Old ones: Available capacity (volume in cubic litres) of water per person per day</p> <p>Storage capacity for potable and grey water at household and community level</p> <p>Rainfall data collected on a monthly basis used to provide advice on water conservation practices and advice on</p>	<p>It cannot cope with the dry seasons.</p> <p>No monitoring stations on island to collect and monitor rainfall data to advice on water conservation practices including advice on other sectors</p>	<p>potable and grey water.</p> <p>By the end of project, at least 80% of households have improved access to water</p> <p>One additional old (other 2 the same): By end of project, women, men, and youth know how to use and read rain gauges</p>	<p>Government quarterly reporting</p> <p>Data collected by the Island municipal government office through rain gauges (on water resources, quality, use and maintenance of water conservation and management technologies)</p>	<p>Maintenance plans can be implemented</p> <p><b>Risks:</b> Theft of water resources</p> <p>Logistical/transport problems and/or prohibitive costs leading to delays in arrival of people and/or materials (R2)</p>

Outcome / Outputs	Indicator	Baseline	Target	Source of Verification	Assumptions and Risks
	other development sectors (farming, fishing, etc.).				
<p><b>Outcome 2b:</b> Appropriate sanitation measures for the outer islands of Yap, Chuuk and Pohnpei are determined for future investment</p> <p>Old one: increased awareness of climate change through formal climate education</p>	<p>Educational &amp; awareness programmes for the outer islands</p> <p>Types of sanitation measures for participating outer islands</p> <p>Old ones: Number of schools with climate education curriculum introduced</p> <p>Level of awareness of climate education in schools at different elementary and all grades</p> <p>Number of teachers trained in climate education at elementary and all grade schools</p>	<p>Existing sanitation measures are health-hazards to the communities</p>	<p>Educational and awareness programmes on sanitation delivered to the participating outer islands</p> <p>Appropriate sanitation measures identified for the participating outer islands</p> <p>Old ones: By end of project, at least two schools participated in the development of the curriculum plan</p> <p>At least 60% of teachers trained on climate education under the new climate education curriculum.</p>	<p>WASH Programmes delivered in outer islands</p> <p>Surveys</p> <p>Sanitation options</p>	<p><b>Assumptions:</b> Outer island communities will be willing to participate in developing and trialling the sanitation measures</p> <p>Communities will participate in WASH programmes</p> <p><b>Risks:</b> No community buy-in</p>

Outcome / Outputs	Indicator	Baseline	Target	Source of Verification	Assumptions and Risks
			At least 80% of students enrolled and taken climate education have a pass rate of 65%		
<p><b>Output 2.1:</b> Outer island communities oriented to CC, SLR, and adaptive capacity measures involving water, health, sanitation and environment</p>	<p>Number of community trainings on climate change, sea-level rise, adaptation and resilience.</p> <p>Number of people (disaggregated by GSI and other categories as appropriate, e.g. community members, local government etc) trained in climate change, sea-level rise, and adaptation and resilience measures.</p> <p>Number of people (disaggregated by GSI and other categories as appropriate, e.g. community members, local government etc) trained in the</p>	<p>The six island sites have limited understanding of the impacts of climate change and sea level rise on the water, health, sanitation and environment sectors.</p> <p>Limited knowledge and experience in the application of climate change information to adaptation planning in outer islands.</p>	<p>At least 60% of the community population in the six outer islands (of which close to 50% are women) are educated on the impacts of CC and SLR on water, health, sanitation and the environment, and have their capacity enhanced to develop adaptation measures to address these impacts.</p> <p>At least 80% of those that participate in the above capacity building activities have acquired knowledge and skills to develop and implement</p>	<p>Review reports, stakeholder consultation reports</p> <p>Stakeholder surveys and evaluations</p> <p>Approved water conservation and management plans</p> <p>Communication materials for climate change, SLR, adaptation and resilience trainings</p> <p>Communication materials for water conservation and management plans</p>	<p><b>Assumptions:</b> Community are receptive to training and are able to engage</p> <p><b>Risks:</b> Community engagement is low</p>

<b>Outcome / Outputs</b>	<b>Indicator</b>	<b>Baseline</b>	<b>Target</b>	<b>Source of Verification</b>	<b>Assumptions and Risks</b>
	<p>implementation of the water conservation and management plans.</p> <p>Completion of stakeholder consultations to review, improve and validate water conservation and management plans.</p> <p>Evaluation (feedback) by outer island community members on the value and effectiveness of the training.</p> <p>Old one: Number of men and women in six outer islands trained in CC, SLR and adaptive capacity measures for water, health, sanitation and environment</p>		adaptation plans and actions.		

Outcome / Outputs	Indicator	Baseline	Target	Source of Verification	Assumptions and Risks
<p><b>Output 2.2:</b> Water Harvesting and Storage System (WHSS) repaired and installed in 6 atoll islands</p>	<p>Completion of recommended improvements to current water infrastructure in six outer islands.</p> <p>Completion of installation of new rainwater harvesting systems in six outer islands.</p> <p>Number of infrastructure improvements by type, island and village supported by the project</p> <p>Number of people (disaggregated by GSI categories) benefitting from interventions installed by the project.</p> <p>Old ones: Number of WHSS</p>	<p>Water cisterns and tanks exist on the islands in poor conditions (leakages, contaminated), including poor guttering and down piping.</p> <p>There is no culture of maintenance of water harvesting systems at community level due to lack of specialised equipment and maintenance planning.</p>	<p>100% of target population have access to potable water from the WHSS.</p> <p>At least 20% of women, men and youth community groups on the outer islands are trained in the maintenance of community water harvesting and storage systems.</p>	<p>Reports on infrastructure assessments in the outer islands.</p> <p>Reports on numbers of facilities repaired and installed.</p> <p>Maintenance guides.</p> <p>Reports from community trainings.</p>	<p><b>Assumptions:</b> Most households will benefit and have access to water facilities once installed</p> <p>Availability of skilled facilitators</p> <p>Community involvement including participation of women and elders</p> <p><b>Risks:</b> Logistical / transport problems and /or prohibitive costs leading to delays in arrival of people and /or materials</p> <p>Team/ island communication difficulties (e.g., only have shortwave radio)</p> <p>Unsuitable infrastructure (e.g.,</p>

Outcome / Outputs	Indicator	Baseline	Target	Source of Verification	Assumptions and Risks
	<p>installed in 6 islands</p> <p>Capacity of storage water (in m3 and ft3) constructed / maintained, per household and per community</p> <p>Number of women, men and youth with access to water from WHSS systems installed at household and community level (church, school, community halls)</p> <p>Agreed maintenance Schedule for installed WHSS</p>				house roofs can't support catchment systems)
<p><b>Output 2.3:</b> Assessment of viable sanitation measures for outer islands in Yap, Chuuk and Pohnpei</p> <p>Old one:</p>	<p>Establishment of collaborative agreements and plans for strategic partnerships with UNICEF, MWYSA and other organisations or networks to deliver</p>	<p>Very limited awareness of WASH techniques useful for application during drought periods and post-typhoon situations.</p>	<p>Sanitation options are being tested and monitored in at least 50% of the target outer islands</p> <p>Old one:</p>	<p>Reports, briefing notes, monitoring visit reports, real time study reports</p>	<p><b>Assumptions:</b> Availability of skilled facilitators</p> <p>Community involvement including participation of women and elders</p>

Outcome / Outputs	Indicator	Baseline	Target	Source of Verification	Assumptions and Risks
<p>Self-composting waterless toilets constructed to conserve water, improve soil environment, and reduce marine eutrophication on the lagoon side</p>	<p>island-level WASH programs</p> <p>Number of people (disaggregated by GSI categories) benefitting from WASH (led by strategic partners including UNICEF, MYWSA and others to be identified) programs to which the project is contributing</p> <p>Completion of sanitation best practice review</p> <p>Completion of a sanitation options menu</p> <p>Completion of installation of solutions based on the menu. Emerging outcomes will be identified through</p>	<p>Limited sanitation facilities with some facilities not used by communities. Currently the majority of people use the lagoon for toileting.</p> <p>The existing water-flushed toilets or pit-latrines are in poor condition, with leakage into soil and lagoon.</p> <p>Contamination / eutrophication of lagoon from excessive nutrient input from human waste</p>	<p>By the end of the soil quality and lagoon water quality have improved as a result of reduced leakage from toilets.</p>		<p><b>Risks:</b></p> <p>Logistical / transport problems and /or prohibitive costs leading to delays in arrival of people and /or materials</p> <p>Accessibility to labs to validate soil and lagoon monitoring tests</p> <p>Team/ island communication difficulties (e.g., only have shortwave radio)</p>

Outcome / Outputs	Indicator	Baseline	Target	Source of Verification	Assumptions and Risks
	<p>monitoring visits and possibly a real time evaluative study.</p> <p>Monitoring will focus on:</p> <ul style="list-style-type: none"> <li>- Extent to which facilities have prompted behaviour change related to use</li> <li>- Operation and maintenance</li> <li>- Roles and responsibility</li> <li>- Self-reported benefits of the new facilities</li> <li>- Monitoring of changes in contamination of freshwater lenses</li> </ul> <p>Old ones:</p> <p>Number of SCT units constructed and in working condition</p> <p>Changes in level of nutrients in soil and groundwater</p>				

Outcome / Outputs	Indicator	Baseline	Target	Source of Verification	Assumptions and Risks
	Percentage of change in dissolved oxygen in the lagoon levels				
<b>Component 3: Demonstration of Kosrae Inland Road Relocation Initiative</b>					
<p><b>Outcome 3:</b> Increased resilience of coastal communities and environment to adapt to coastal hazards and risks induced by climate change</p>	<p>Number of women, men and youth benefiting from the access provided by inland road</p> <p>Number of women, men and youth benefiting from coastal defences</p> <p>The second indicator has been added to replace this one: Quality condition of road after extreme rainfall event</p>	<p>Malem-Utwe coastal road highly exposed to severe coastal erosion and is in high risk of being washed away within the next 10 -30 years</p> <p>Unsealed inner road limits access of communities inland</p>	<p>One road design produced in line with best practice.</p> <p>Funding for the construction of the road based on the road design is in place.</p> <p>At least 1,476 inhabitants of Malem and Utwe have increased coastal resilience to inundation and erosion. Same</p> <p>Old ones: At least one landslide, flooding or agriculture-related risk management</p>		<p>Island stakeholders and key players (e.g.: Kosrae State Government) have a high interest in, support for, and engagement in capacity building activities in Kosrae.</p> <p>Political will and commitment from the community and government</p> <p>Continuous support provided by the government and development partners.</p>

Outcome / Outputs	Indicator	Baseline	Target	Source of Verification	Assumptions and Risks
			<p>response has been implemented by Malem and/or Utwe</p> <p>By the end of the project replication and up-scaling activities are explicitly informed by lessons learned and good practices relating to gender in Kosrae</p> <p>Targeted beneficiaries are the 2,283 people resident in the Malem<sup>56</sup> and Utwe<sup>57</sup> municipalities. Indirect beneficiaries include 4,333 residents of other Kosrae Municipalities</p>		
<p><b>Output 3.1:</b> Malem - Utwe inland road and access routes</p>	<p>Design for construction of the</p>	<p>No road or design for a new road exists</p>	<p>A completed road design that includes all climate risks and</p>	<p>Consultant reports</p>	<p><b>Assumptions:</b> Procurement process will follow FSM</p>

Outcome / Outputs	Indicator	Baseline	Target	Source of Verification	Assumptions and Risks
<p>designed for future construction</p> <p>Old one: 3.6 miles (5.8km) of Malem-Utwe inland road and access road routes constructed to an unsealed rural road standard for future relocation</p>	<p>road completed to best practice.</p> <p>Old ones: Number of road easements obtained against number of road easements required</p> <p>Number of kilometers of inland road constructed to an unsealed rural road standard</p> <p>Length of new and relay water mains along Malem - Yeseng - Mosral - Kuplu section installed and connected to existing water supply at Malem and Finfokoa.</p> <p>Length of new power</p>	<p>Previous baseline: Current inland road (1.5 km) is gravel only, in poor condition, and does not meet climate resilience standards</p> <p>No water mains are connected from Malem and Utwe except old water mains.</p> <p>No power lines and telecommunication lines from Malem to Utwe via Kuplu Wan</p>	<p>resilience aspects as well as consideration for all essential utility requirements.</p> <p>Financing of the road construction is achieved.</p> <p>Old ones: Approximately 8.5 km of inland road of the Malem-Utwe road constructed to climate resilient unsealed rural road standard with access routes to the two villages</p> <p>Water running through connected and completed mains for the Malem – Yeseng – Mosral – Kuplu section</p> <p>New power and telecommunication</p>	<p>Road design report and survey results.</p>	<p>Government procurement processes</p> <p>Procurement process will be undertaken by experienced personnel</p> <p><b>Risks:</b> Design will raise inclusions beyond the budget allocation</p> <p>Consultants may not be experienced in road design in this type of geographical and climate location</p>

Outcome / Outputs	Indicator	Baseline	Target	Source of Verification	Assumptions and Risks
	<p>line along entire length of inland road from Malem to Utwe via Kuplu Wan installed</p> <p>Length of new telecommunication lines along entire length of inland road from Malem to Utwe vi</p>		<p>lines installed along the entire length of the inland from Malem to Utwe via Kuplu Wan</p>		
<p><b>Output 3.2:</b> Transitional coastal protection at Mosral and Paal upgraded for immediate coastal protection</p>	<p>Coastal revetment design completed to best practice (new one)</p> <p>Length (in kilometres/miles) of coastline revetment</p>	<p>Ineffective loose boulder defences at Mosral and Paal patched only after extreme events</p>	<p>Mosral and Paal coastline revetted in the order of 2.5 km or 1.6 miles</p>	<p>DT&amp;I reports</p> <p>Consultant / engineer reports on design</p>	<p><b>Assumptions:</b> Procurement process will be undertaken by experienced personnel</p> <p>KSG is able to fund maintenance of the transitional defences</p> <p><b>Risks:</b> The coastal defence work may cost more than the budget allocation due to unknown costs, problems or changes to the scope and scale</p>

Outcome / Outputs	Indicator	Baseline	Target	Source of Verification	Assumptions and Risks
<b>Component 4: Knowledge management for improved water and coastal protection</b>					
<p><b>Outcome 4:</b> Capacity and knowledge enhanced and developed to improve management of water and coastal sectors to adapt to climate change</p>	<p>Number of awareness materials on climate change, sea-level rise, vulnerability and adaptive capacity prepared in local language and distributed to community and other stakeholders.</p> <p>Number of success stories developed and shared on briefs, brochures, pamphlets, posters prepared and distributed.</p> <p>Number of men, women and youth participating in trainings and planning meetings.</p>	<p>Programs carried out by various stakeholders (government, private sectors, and academic institutions) in the Outer Islands are not consolidated and implemented under island development plans that exist.</p> <p>No systematic approach to awareness of opportunities and issues around climate change in outer islands and community / municipal government levels</p> <p>There is lack of gender-sensitized management and execution of climate-</p>	<p>At least 60 awareness and knowledge management products on the project results are produced and disseminated to stakeholders. (new one)</p> <p>At least eight success stories or knowledge products generated on lessons learned and best practices have been produced, published and shared with targeted stakeholders each project year</p> <p>At least 50% of perception responses (at least 50% are from women) to significant level of awareness and acknowledgement of</p>	<p>Site/field visits and surveys.</p> <p>Project reports</p> <p>Project monitoring and evaluation reports.</p> <p>Project monitoring and evaluation reports documenting lessons learned and good practices in climate change mainstreaming that comprehensively addresses gender</p> <p>Independent evaluation reports</p> <p>Training evaluation reports</p>	<p><b>Assumptions:</b> Local capacity exists to produce training materials that are of a high standard.</p> <p>Strong island and community interest in, support for, and engagement in capacity building activities in the Outer Islands of each State.</p> <p><b>Risks:</b> Locally available printing, video and audio production capacity</p>

Outcome / Outputs	Indicator	Baseline	Target	Source of Verification	Assumptions and Risks
		<p>related projects and programs.</p> <p>The approaches with existing projects are only in pilot and in silo approaches without integration across program planning.</p>	<p>gender and climate change benefits – compliance with natural resource management and gender dimensions of climate change</p>		
<p><b>Output 4.1:</b> Resource materials developed, tailored to local context, translated, published and shared amongst various stakeholders</p>	<p>Completion of recruitment of Knowledge and Communication Officer</p> <p>Completion of project-level knowledge management strategy</p> <p>Number of practical information products made by the project (by type and intended audience)</p> <p>Number of public communications of results and information made by</p>	<p>No project awareness materials have been developed or made available</p> <p>No data management strategy is in place.</p>	<p>By the end of the Project, at least 60 awareness and knowledge management products on the project results are produced and disseminated to stakeholders</p> <p>At least 1 inter-state or south-south exchanges on lessons learned and best practices on practical island interventions (this target was previously for output 4.3)</p>	<p>Executed contract or workplan, strategy document, information products</p> <p>Data management agreements with partners, plans, reports, guidance documents</p>	<p><b>Assumptions:</b> No delays in the recruitment process(es)</p> <p><b>Risks:</b> Logistical / transport problems and /or prohibitive costs leading to delays in arrival of people and /or materials</p> <p>Team/ island communication difficulties (e.g., only have shortwave radio)</p>

Outcome / Outputs	Indicator	Baseline	Target	Source of Verification	Assumptions and Risks
	<p>the project (by type and intended audience)</p> <p>Number of Project-related reports in local media</p> <p>Completion of data management plan/roadmap</p> <p>Completion of data systems integration</p> <p>Completion of sustainability plan for integrated data system</p>		<p>An accessible project data management and storage system with the complete Project history, results and knowledge products developed and maintained by DECM (new one)</p>		