



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:

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ADAPTATION FUND

PROJECT PROPOSAL TO THE ADAPTATION FUND

PART I: PROJECT INFORMATION

Project/Programme Category:	Regular Project
Country/ies:	Federated States of Micronesia (FSM)
Title of Project/Programme:	Enhancing the climate change resilience of vulnerable island communities in the Federated States of Micronesia (FSM)
Type of Implementing Entity:	Regional Implementing Entity
Implementing Entity:	Secretariat of the Pacific Regional Environment Programme (SPREP)
Executing Entity/ies:	Department of Environment, Climate Change & Emergency Management (DECEM)
Amount of Financing Requested:	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 (km²) in the western Pacific Ocean (Figure 1). The land area totals 704.6 km², with 7,192 km² 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 km². 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 km² (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.

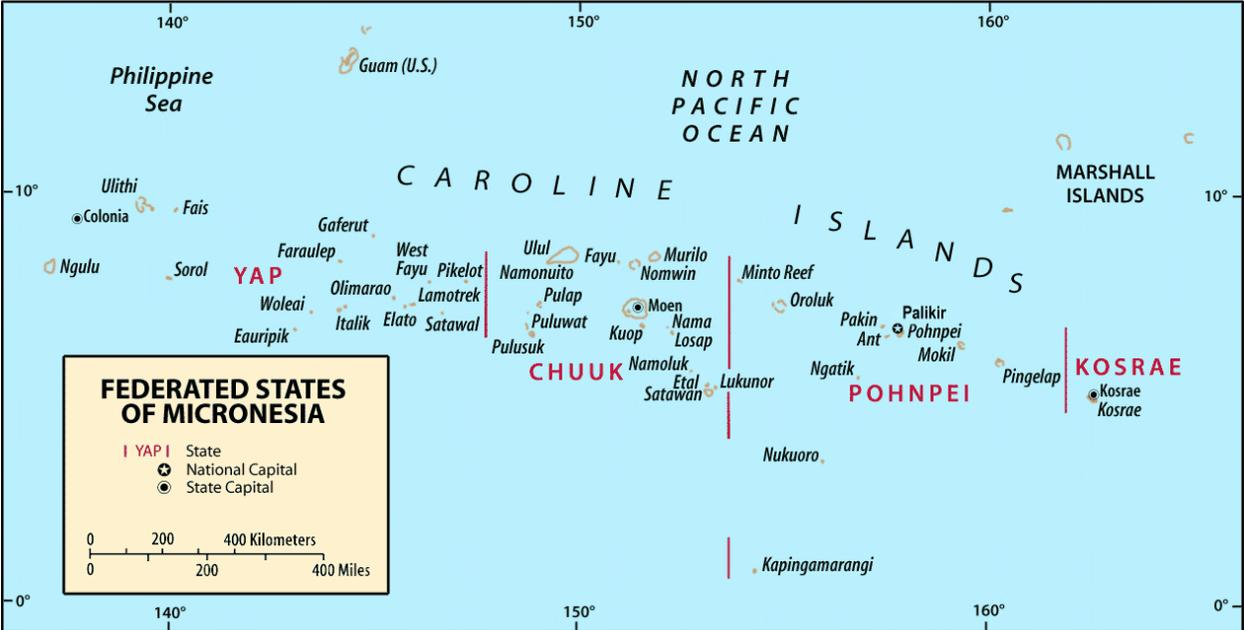


Figure 1. Map of the Federated States of Micronesia¹

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

¹ 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>

vegetated and eroded. Mangroves grow around the coastal fringes. Land elevations range up to 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 level².

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 states³

State	No. of Island Groups	No. Islands	No. Inhabited Islands	Topography (HV, A)*	Land area (km ²)	Lagoon Area (km ²)	Popn. (2010)	Popn Density*
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

² FSM, 2015, Second National Communication under the UN Framework Convention on Climate Change

³ 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.⁴
- 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.

⁴ 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 FSM⁵

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 coasts⁶.

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

⁵ 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.

⁶ 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"⁷.

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 water⁸.

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

⁷ 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.

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

saltwater intrusion on taro, breadfruit, and banana crops. Monitoring data are needed to manage 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 inundation⁹.

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

⁹ 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.

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.

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 consolations, 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 km² (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 minerals¹⁰.

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

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

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 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 wildfires¹¹.

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.

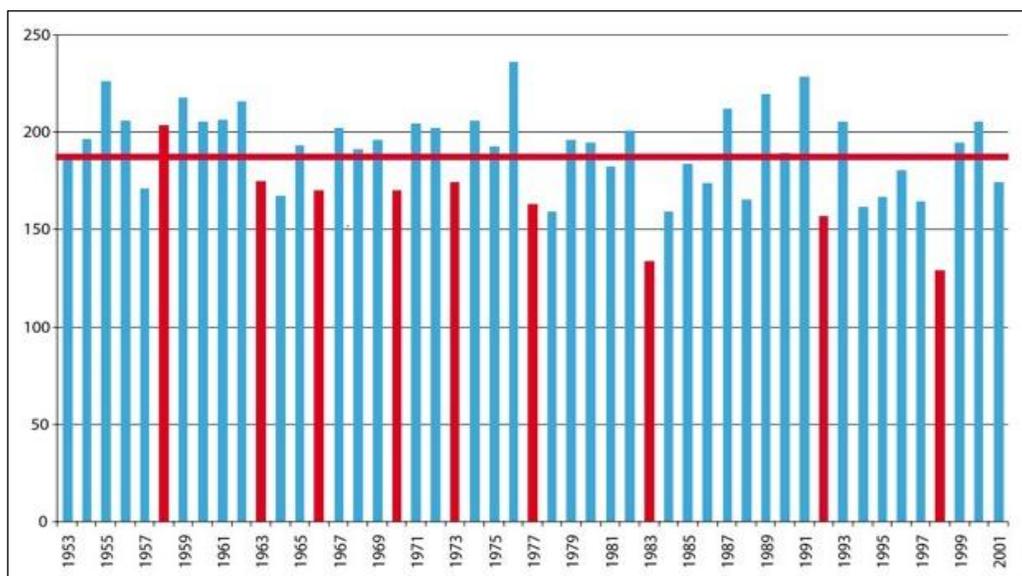


Figure 2. Time series of annual rainfall at the Pohnpei Weather Service Observatory (WSO). Most post-El Niño years (red bars) are dry.
(Source: Lander and Khosrowpanah, 2004)

¹¹ FSM Second National Communication Report to the UNFCCC, 2015.

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.

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.

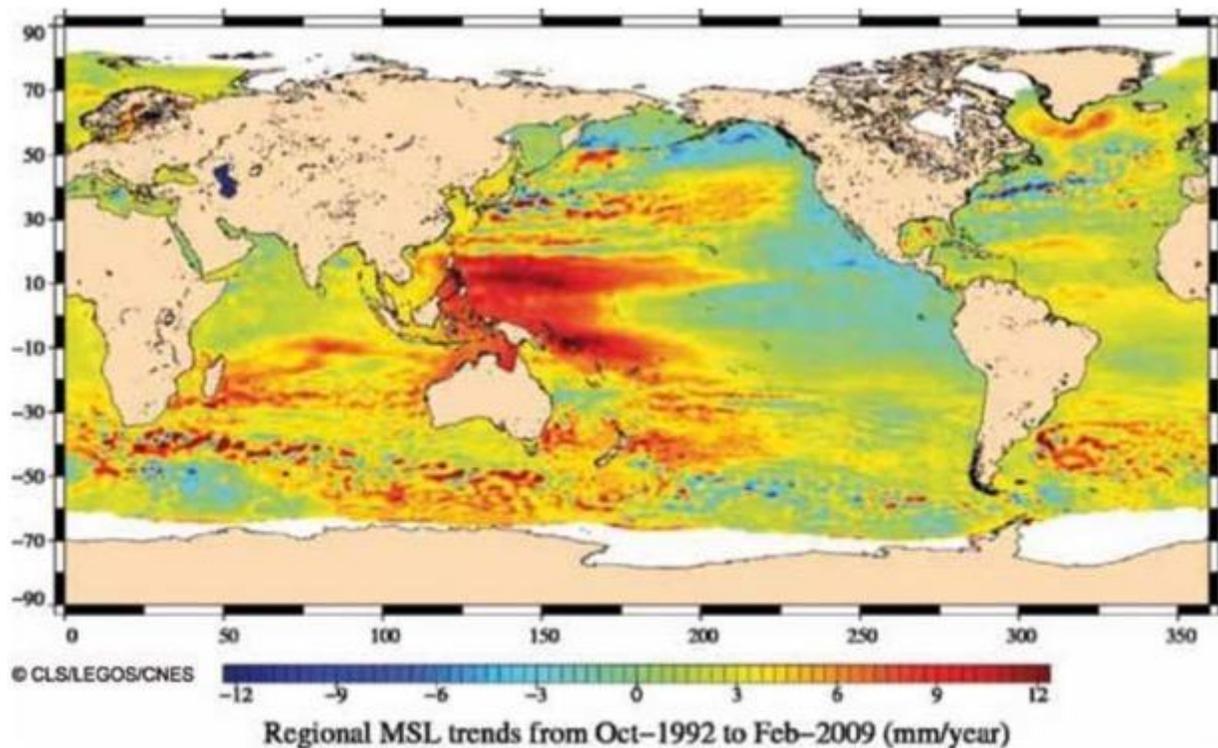


Figure 3. Rate of Sea Level Change, 1992 - 2009

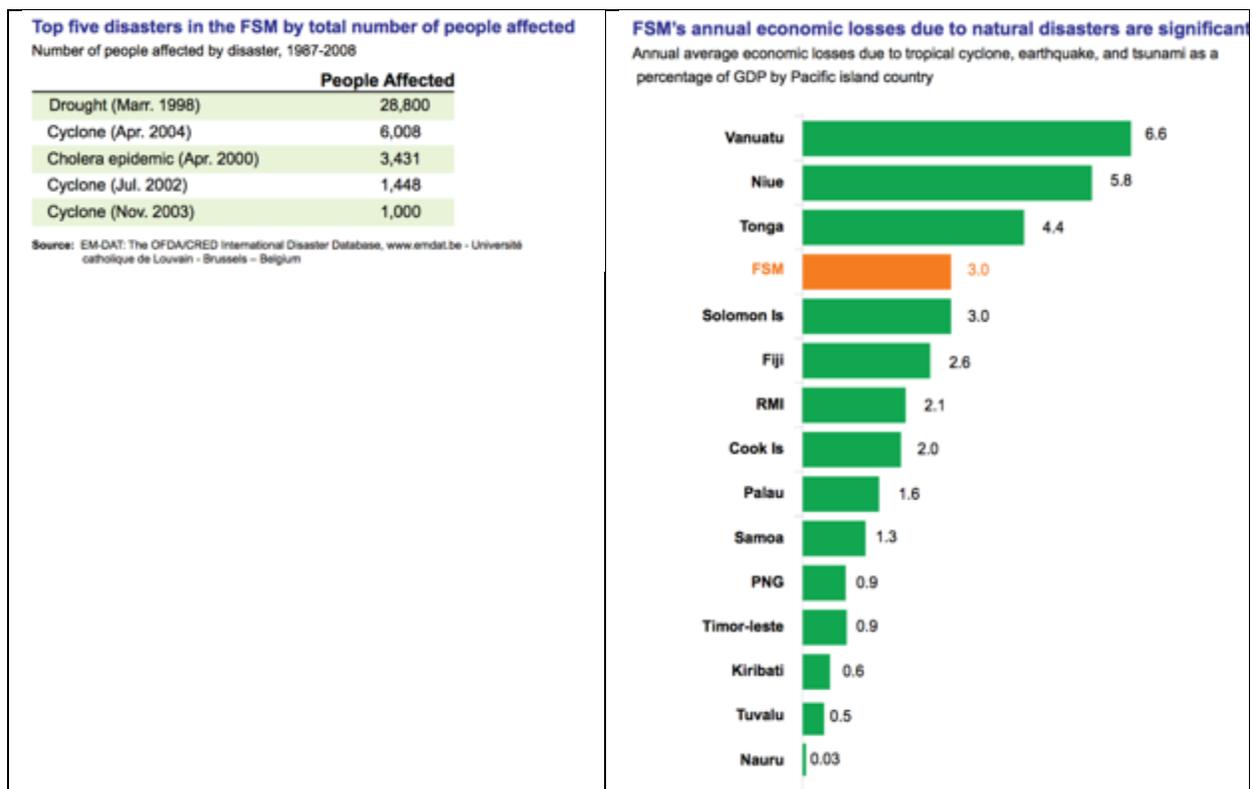
Rainfall

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 ocean¹².

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

¹² Ibid

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.

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.¹³

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.^{14,15}

Box 1. The Special Challenges of FSM’s Atolls¹⁶

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

¹³ 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.

¹⁴ 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.

¹⁵ Ibid.

¹⁶ 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.

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.

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 communities¹⁷:

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)¹⁸. The SDP and the Infrastructure Development Plan

¹⁷ 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.

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 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.¹⁹

¹⁹ Ibid.

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 effective (i.e., best practices)²⁰. 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 ² 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

²⁰ 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>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 the precious water resources; and technical issues, such as breakdown of pumps and leakages. Solutions proposed included:</p> <ul style="list-style-type: none"> ■ Putting a water meter in every household; ■ Installing solar water pumps in villages; ■ More water tanks; ■ Strengthening governance capacities of water committees; and ■ Better transparency and communication between water consumers and water committees.
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 success²¹.

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.

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

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.

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 Profile²²
- 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*²³.

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:

²² ADB, 2005

²³ CIRIA/CUR, 1991

- **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.

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	\$2,459,400

		and installed in 6 atoll islands	
	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			\$8,294,931
7. Project/Programme Cycle Management Fee charged by the Implementing Entity (if applicable)			\$705,069
Amount of Financing Requested			\$9,000,000

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

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 projects²⁴. 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)

²⁴ IDP 2016-2025, Government of FSM

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 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 organizations²⁵ - 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.

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

²⁵ GIZ, SPC, SPREP, UNDP, GIZ, PACC Project (2015)

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 demands²⁶. 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 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 parts²⁷. 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

²⁶ Rapid Assessment Report, March 2016, FSM

²⁷ *ibid*

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:

- 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
Rainwater catchment systems	
Key activities	Repair household rainwater catchment systems
Minimum requirements	<ul style="list-style-type: none"> • Repair existing systems to ensure that there is: • 2 HDPE²⁸ tanks per household criteria for maintenance without • Extend gutters to full dimension • Increase catchment area by using reliability curves²⁹ • Increasing storage tank volume using reliability curves • Clean up awareness campaign • Clean up and maintenance training • Maintenance schedules established • Project and Household agreement for monitoring and maintenance through duration of project

²⁸ 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.

²⁹ 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., Miklavič, 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.

Wells	
Minimum safety measures	<ul style="list-style-type: none"> • Construct rim walls extending up off the ground for wells without walls • Build covers for wells without and repair damaged covers

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 disposal³⁰.

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

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

³⁰ Based on Maslow's hierarchy of water requirement needs, WHO 2013.

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 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 island³¹. 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 facilities³². Depending on the outcomes of the

³¹ Based on Maslow's hierarchy of water requirement needs, WHO 2013.

³² 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

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 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

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.

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.

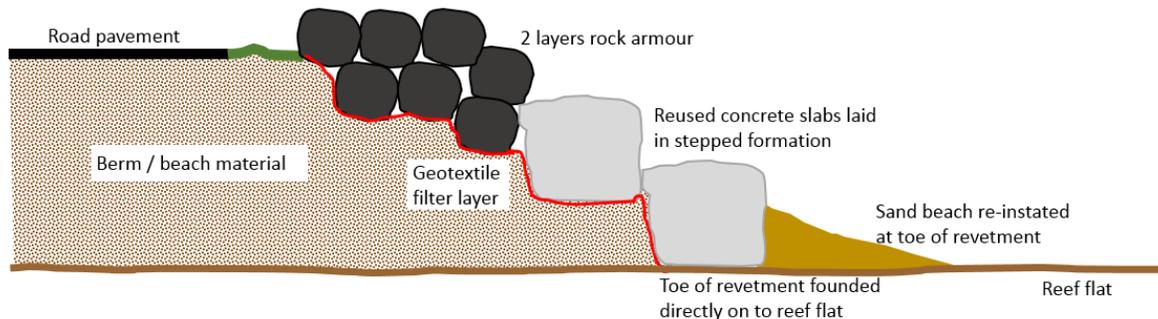


Figure 10. Cross-section of the proposed reconstructed revetment at Paal

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.

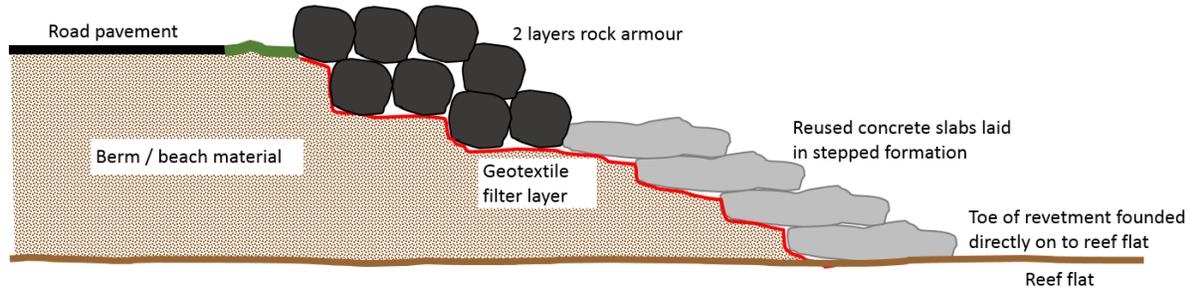


Figure 11. Cross-section of the proposed reconstructed revetment at Mosral

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); and the Pacific Disaster Net (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 Series³³ 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.

³³ 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 ³⁴		99.5
	Not Improved ⁵⁴		0.5
Toilet facility - % per household	Improved ³⁵		24.7
	Not Improved ⁵⁵		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

³⁴ '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)

³⁵ 'Improved' includes flush toilet, water sealed and ventilated 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 Lukonor

	Satawan	Lukonor	Total
Population	692	848	1540
Male	360	446	806
Female	332	402	734
Households	97	119	216
Sources of drinking water, % per household	Improved ⁵⁴		94.7
	Not Improved ⁵⁴		5.3
Toilet facility - % per household	Improved ⁵⁵		34.2
	Not Improved ⁵⁵		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 ⁵⁴		98.4
	Not Improved ⁵⁴		1.6
Toilet facility - % per household	Improved ⁵⁵		55.2
	Not Improved ⁵⁵		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 ⁵⁴		92.4
	Not Improved ⁵⁴		7.6
Toilet facility - % per household	Improved ⁵⁵		98.3
	Not Improved ⁵⁵		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
Social	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>Economic</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>Environmental</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
<p>Social</p>	<p>High risk of communities being cut off from access to capital and utilities (power, water, electricity, hospital,</p>	<p>Increase coastal resilience to inundation and erosion benefiting approximately 2,283 inhabitants of Malem and Utwe</p>

	<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>
Economic	<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>
Environmental	<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
Component 1. Strengthening policy and institutional capacity for integrated coastal and water management at national, state levels and outer islands			
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.
Component 2. Demonstration of water security and sanitation measures in outer islands of Yap, Chuuk and Pohnpei			
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
Component 3. Demonstration of Kosrae Inland Road Relocation Initiative			
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
Component 4. Knowledge management for improved water and coastal protection			
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.
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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
Component 1, Output 1.1: 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>Component 1, Output 1.2: 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>Component 1, Output 1.3: 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>
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<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>
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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>
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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>
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<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>
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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
Water Harvesting and Storage system		
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.
Sanitation Options		
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
Water Harvesting & Storage Systems		
<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\$560³⁶.</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 appropriate. Undertaking</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>

³⁶ 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>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>Bush toilet: this is a hole in the ground with a simple cover around the hole.</p> <p>Pit toilet: 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>Ventilated improved pit toilet (VIP): These are really the same as pit toilets but have a PVC pipe added to improve airflow and reduce flies and smells.</p> <p>Water seal: 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>Flush/Septic toilet: 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>Self-composting toilet (SCT): 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\$4000³⁷ 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>
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³⁷ 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>	
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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 study³⁸ 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

³⁸ 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 ramparting 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.³⁹

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).

³⁹ 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, responsible agency	Project elements consistent with the policy
1	Nationwide Climate Change Policy <i>Department of Environment, Climate Change & 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 & 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 & 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.⁴⁰ 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.

⁴⁰ Federated States of Micronesia State-Wide Assessment and Resource Strategy 2010-2015+. Undated. p. 10. <http://www.wflccenter.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:
Component 1: Strengthening policy and institutional capacity for integrated coastal and water management at national, state levels and outer island			
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
Component 2: Demonstration of water security and sanitation measures in outer islands of Yap, Chuuk and Pohnpei			
3	Rainwater harvesting systems	Minimum standards of the Rainwater Catchment Design and Installation Standards (ARCSEA, 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
Component 3: Demonstration of Kosrae inland road relocation initiative			
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
Component 4: Knowledge management for improved water and coastal protection			
10	Key stakeholder participation	IDP strategic consideration of 'Involvement of States'	DECEM, State EPA and R&D offices, KIRMA
11	Generation of evidence-based learning	SNC Report adaptation recommendations, National Climate Change Policy suggested benefits	RIE, DECEM
12	Sharing of learning	Government protocols for participation in learning sharing events	DECEM, State EPA offices, R&D office, KIRMA
13	Development of knowledge products	Knowledge standards established by SPREP and other agencies	SPREP and DECEM

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 – 2015⁴¹.

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.

⁴¹ 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 Micronesia 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	Micronesia Challenge Trust (Kosrae Office) Kosrae Conservation Society Organization COM IMO MCT

		Kosrae Land Court DAF Dept. Environment ODA	
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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 2020, 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 Lekinloch 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	Island Council Members: Bercin Dumm Bethwel Hitapuwae 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>SPC RENI Project Sean Kaarard, Project Manager Caleb Gamule, Former Mayor of Kapinga (assistant)</p> <p>Pohnpei State Legislature 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 2106, 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 policies⁴².</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</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</p>

⁴² 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>coastal and urban zones are undertaken through a business-as-usual approach.</p> <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>developed US environment. Furthermore, it responds to a lesson learned from the PACC 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</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</p>

	<p>to collect water from neighbours or travel long distances to fetch water from dry and salinized wells. Rainwater harvesting 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>Pohnpei. Initial reviews undertaken in 2019 highlight approximately 42 tanks will be repaired or installed.</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</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>endorsed by the Governor of the State.</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>Following extensive consultations in 2019 with the National Government (i.e DECEM, TC&I), the State of 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,</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.</p>

	<p>Kapingamarangi have their own community development plans. These address economic and social development, and political 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</p>	<p>The products will be tailored to local context, translated, published, and shared amongst various stakeholders. This will 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>
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	<p>(https://www.pacificclimatechange.net). These will be used to store and capture information developed and collected by the project.</p>	
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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.

AF ESS Principles	Applicability to Project
<p>Principle 1: Compliance with the Law <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"> • Coastal reinforcements (Kosrae) <p>The following regulations are applicable for this project:</p> <ul style="list-style-type: none"> • Kosrae State Code • Kosrae Regulations for Development Projects • FSM Earthmoving regulations • FSM Labour Act • Yap State Code • Pohnpei State Code • Chuuk State Code • FSM National Code • Basel and Waigani Convention • Convention on Biological Diversity
<p>Principle 2: Access and Equity <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>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</p>

	term access to the interventions. Risks of this type are addressed in the ESMP.
<p>Principle 3 – Marginalised and Vulnerable Groups <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>Principle 4 – Human Rights <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>Principle 5 – Gender Equality and Women’s Empowerment <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>Principle 6 – Core Labour Rights <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>Principle 7 – 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</p>

<p><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>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>Principle 8 – Involuntary Resettlement <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>Principle 9 – Protection of Natural Habitats <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>Principle 10 – Conservation of Biological Diversity <i>Projects/programmes supported by the Fund shall be designed and implemented in a way that avoids</i></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>any significant or unjustified reduction or loss of biological diversity or the introduction of known invasive species.</i></p>	
<p>Principle 11 – Climate Change <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>Principle 12 – Pollution Prevention and Resource Efficiency <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>Principle 13 – Public Health <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>Principle 14 – Physical and Cultural Heritage <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>Principle 15 – Lands and Soil Conservation <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</i></p>	<p>This principle is not applicable to this project as the Kosrae road construction activity is limited to design only.</p>

productive lands or land that provides valuable ecosystem services.

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, Nukouro 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.

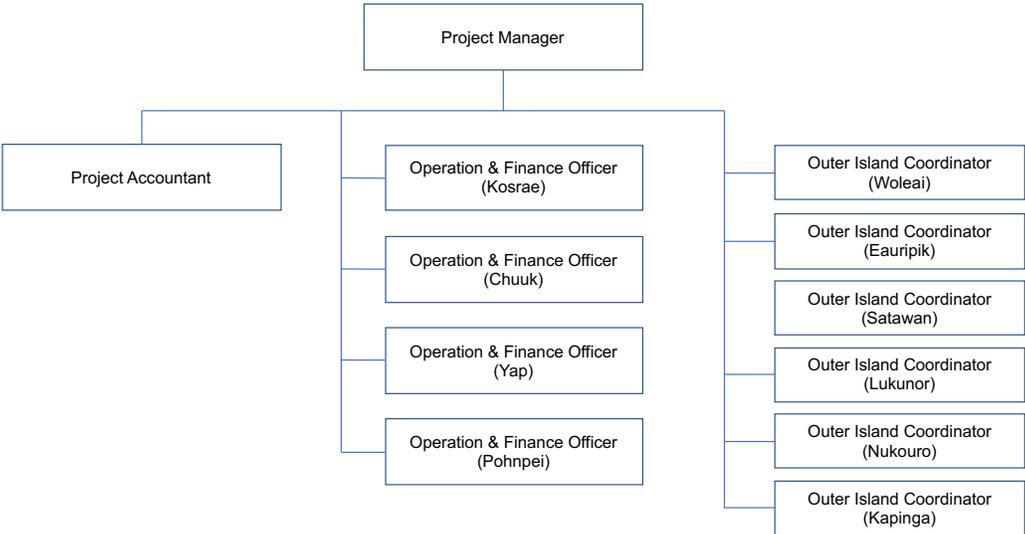


Figure 12. Project Management Unit structure

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

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

Table 18. Estimate project management costs

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

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).

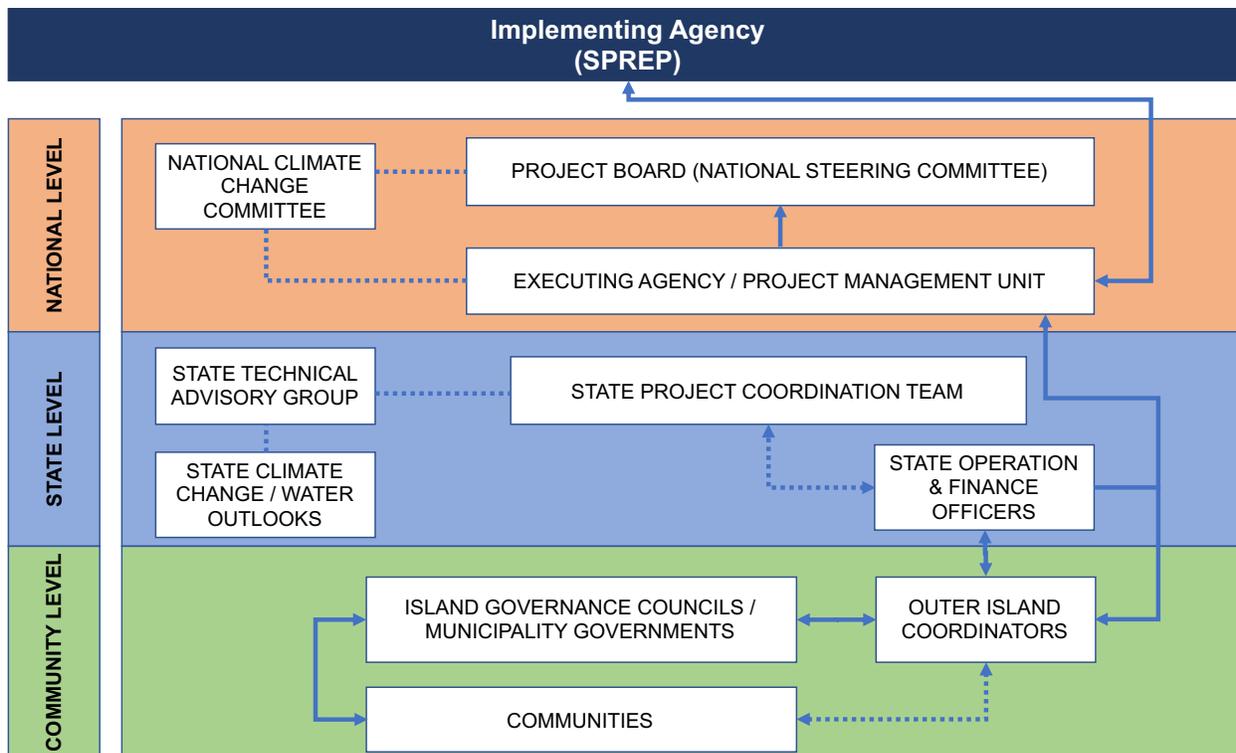


Figure 13. Project implementation arrangements at national, state and outer island level

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 Mofu											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)		
Institutional Risks																
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 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)	
Project Risks															
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	N/A		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 NCO'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 suit 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 been 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 of 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)	
Financial Risks															
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 country 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 timeslot 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"> ● Provide high level oversight, guidance and M&E expertise as required. ● Ensure M&E is embedded in project operations
Project Management Unit and Executing Agency	<ul style="list-style-type: none"> ● Lead and manage M&E activities and project reporting ● Develop detailed results framework and M&E Implementation Plan during the scoping phase ● Design and carry out or commission the baseline/situation analysis ● Ensure responsibilities and timing for collection of monitoring data is clear ● Design reporting templates and tools and provide guidance on their use ● Ensure collection of monitoring data is integrated into project activities ● Coordinate gathering of information from monitoring visits ● Manage and analyse project M&E data as required ● Carry out or commission and manage real time studies as required ● Use M&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 ● Commission and manage an end-of-program evaluation, including an analysis of socioeconomic benefit ● Manage dissemination of M&E data and reporting to stakeholders
Implementation Partners	<ul style="list-style-type: none"> ● Provide regular reports and data as required by the M&E Implementation Plan
Outer Island Councils	<ul style="list-style-type: none"> ● Provide access to data and information as required ● Facilitate M&E at the Island level by arranging access and authorising activities

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 ⁴³	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

⁴³ 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
Total				\$873,780

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
Project Objectives:							
<ol style="list-style-type: none"> 1. Prepare the necessary institutional and regulatory frameworks, policies, guidance, and tools to help deliver a climate resilient FSM 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 3. Provide communities with climate resilient infrastructure to help relocate from high risk coastal inundation sites 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 							
Component 1: Strengthening policy and institutional capacity for integrated coastal and water management at national, state levels and outer island levels							
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 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	Assumptions: Political will and commitment to encourage participation of key government stakeholders at national level. Political will to adopt the guidance and recommendations within Departments. Risks: 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.			
Output 1.1: 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	Assumptions: Political will and commitment to encourage participation of key government stakeholders at national level. Political will to adopt the guidance and recommendations within Departments. Risks: 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.
Output 1.2: 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	Assumptions: Political will and commitment to encourage participation of key government stakeholders at national level. Political will to adopt the guidance and recommendations within Departments. Risks: Limited or no buy-in from national stakeholders. Change of Government and priorities.
Output 1.3: 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	Assumptions: Political will and commitment to developing a National WSP. Strong Government leadership and support for development of the WSP. Risks:

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.
Output 1.4: 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	Assumptions: 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. Risks: Limited or no buy-in from State government stakeholders.
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	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	Assumptions: Household / Individuals accept the need to limit water usage Maintenance plans can be implemented Risks:

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)
Outcome 2b: 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	Assumptions: Outer island communities will be willing to participate in developing and trialling the sanitation measures Communities will participate in WASH programmes Risks: No community buy-in
Output 2.1: 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	Assumptions: Community are receptive to training and are able to engage Risks: 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.						
Output 2.2: 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>Assumptions: 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>Risks: 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>
Output 2.3: 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 &	Assumptions: 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>Risks: 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>
Component 3: Demonstration of Kosrae Inland Road Relocation Initiative							

Expected Result	Indicator	Baseline data	Targets	Source of Verification / Data collection methods	Frequency	Responsibility	Assumptions and Risks
<p>Outcome 3: 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 & 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>Output 3.1: 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 & Finance Officer</p>	<p>Assumptions: Procurement process will follow FSM Government procurement processes</p> <p>Procurement process will be undertaken by experienced personnel</p> <p>Risks: 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
Output 3.2: 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	Assumptions: Procurement process will be undertaken by experienced personnel KSG is able to fund maintenance of the transitional defences Risks: The coastal defence work may cost more than the budget allocation due to unknown costs, problems or changes to the scope and scale
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	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	Assumptions: 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>Risks: Locally available printing, video and audio production capacity</p>
Output 4.1: 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,	Assumptions:

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>Risks: 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) ⁴⁴	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

⁴⁴ 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
Project Outcome(s)	Project Outcome Indicator(s)	Fund Output	Fund Output Indicator	Grant Amount (USD)
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

COMPONENT	OUTPUT	OUTCOME	Year 1: 2018 (USD)	Year 2: 2019 (USD)	Year 3: 2020 (USD)	Year 4: 2021 (USD)	Year 5: 2022 (USD)	Year 6: 2023 (USD)	Total Output Budget	Total Outcome Budget
Component 1. Strengthening policy and institutional capacity for integrated coastal and water management at national, state levels and outer island levels	Output 1.1 Legislation and policy paper to guide regulation of climate resilient coastal and marine management at national level	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	-	79,250.00	34,250.00	28,500.00	-	-	142,000.00	600,900.00
	Output 1.2 State regulations for coastal and marine development projects amended to consider climate change risks and resilience measures		-	-	72,400.00	70,900.00	-	-	143,300.00	
	Output 1.3 State Water Outlook and Water Sector Investment Plan developed and implemented		-	-	92,800.00	83,800.00	72,000.00	67,000.00	315,600.00	
Total Outcome Budget			-	79,250.00	199,450.00	183,200.00	72,000.00	67,000.00	600,900.00	600,900.00
Component 2. Demonstration of water security and sanitation measures in outer islands of Yap, Chuuk and Pohnpei	Output 2.1 Outer island communities oriented to CC, SLR, and adaptive capacity measures involving water, health, sanitation and environment	Outcome 2a Water conservation and management technology & practices adopted, responding to drought, sea level rise and early recovery from cyclones	-	26,200.00	183,200.00	76,200.00	80,000.00	-	365,600.00	3,100,413.00
	Output 2.2 Water Harvesting and Storage System (WHSS) repaired and installed in 6 atoll islands	Outcome 2b Appropriate sanitation measures for the outer islands of Yap, Chuuk and Pohnpei are determined for future investment	-	222,400.00	1,575,500.00	534,250.00	118,750.00	8,500.00	2,459,400.00	
	Output 2.3 Assessment of viable sanitation measures for outer islands in Yap, Chuuk and Pohnpei		-	-	79,500.00	101,913.00	77,000.00	17,000.00	275,413.00	
Total Outcome Budget			-	248,600.00	1,838,200.00	712,363.00	275,750.00	25,500.00	3,100,413.00	3,100,413.00
Component 3. Demonstration of adaptation measures for coastal communities in Kosrae State	Output 3.1. Malem - Utwe inland road and access routes designed for future construction	Outcome 3. Increased resilience of coastal communities and environment to adapt to coastal hazards and risks induced by climate change	-	579,000.00	209,000.00	-	-	-	788,000.00	3,374,000.00
	Output 3.2 Transitional coastal protection at Mosral and Paal upgraded for immediate coastal protection		-	-	536,000.00	1,541,000.00	509,000.00	-	2,586,000.00	
Total Outcome Budget			-	579,000.00	745,000.00	1,541,000.00	509,000.00	-	3,374,000.00	3,374,000.00
Component 4. Knowledge management for improved water and coastal protection	Output 4.1 Resource materials developed, tailored to local context, translated, published and shared amongst various stakeholders	Outcome 4. Capacity and knowledge enhanced and developed to improve management of water and coastal sectors to adapt to climate change	-	25,000.00	113,800.00	123,800.00	97,000.00	72,000.00	431,600.00	431,600.00
Total Outcome Budget			-	25,000.00	113,800.00	123,800.00	97,000.00	72,000.00	431,600.00	431,600.00
TOTAL OUTCOME BUDGET			-	931,850.00	2,896,450.00	2,560,363.00	953,750.00	164,500.00	7,506,913.00	7,506,913.00
Project Management			48,220.00	185,200.00	168,000.00	162,000.00	163,500.00	61,098.00	788,018.00	788,018.00
TOTAL PROJECT MANAGEMENT BUDGET			48,220.00	185,200.00	168,000.00	162,000.00	163,500.00	61,098.00	788,018.00	788,018.00
TOTAL PROJECT BUDGET			48,220.00	1,117,050.00	3,064,450.00	2,722,363.00	1,117,250.00	225,598.00	8,294,931.00	8,294,931.00

Component 1. Strengthening policy and institutional capacity for integrated coastal and water management at national, state and outer island levels											
OUTPUT	ACTIVITY	BUDGET CATEGORY	BUDGET BY YEAR							USD	
			2018	2019	2020	2021	2022	2023			
			USD	USD	USD	USD		USD	USD		
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	Consultant - International		79,250.00	20,750.00	-			100,000.00	142,000.00	
		Workshops / Meetings / Forums			13,500.00	13,500.00			27,000.00		
		Communications: Publishing / Printing				15,000.00			15,000.00		
		Other							-		
	SUB-TOTAL			-	79,250.00	34,250.00	28,500.00		-	142,000.00	142,000.00
	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	Consultant - International				-	-			-	-
		Workshops / Meetings / Forums				-	-			-	
		Communications: Publishing / Printing				-	-			-	
		Other				-	-			-	
	SUB-TOTAL			-	-	-	-		-	-	-
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.	Consultant - International			36,000.00	36,000.00			72,000.00	143,300.00	
		Travel			10,200.00	8,700.00			18,900.00		
		Workshops / Meetings / Forums			13,800.00	13,800.00			27,600.00		
		Community Consultations			12,400.00	12,400.00			24,800.00		
		Other							-		
	SUB-TOTAL			-	-	72,400.00	70,900.00		-	143,300.00	143,300.00
	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	Consultant - International				-	-			-	-
		Travel				-	-			-	
		Workshops / Meetings / Forums				-	-			-	
		Community Consultations				-	-			-	
Other					-	-			-		
SUB-TOTAL			-	-	-	-		-	-	-	
Output 1.3 State Water Outlook and Water Sector Investment Plan developed and implemented	Activity 1.3.1 Support the implementation of State-level Water Outlook and Investment Plans	Consultant - International			27,000.00	27,000.00	27,000.00	27,000.00	108,000.00	315,600.00	
		Travel			28,000.00	28,000.00	17,000.00	17,000.00	90,000.00		
		Water Forums			13,800.00				13,800.00		
		Workshops: Water Investment Plans			4,000.00	3,800.00	3,000.00	3,000.00	13,800.00		
		Communications: Publishing / Printing			-	5,000.00	5,000.00	-	10,000.00		
		Other			20,000.00	20,000.00	20,000.00	20,000.00	80,000.00		
	SUB-TOTAL			-	-	92,800.00	83,800.00	72,000.00	67,000.00	315,600.00	315,600.00
COMPONENT TOTAL			-	79,250.00	199,450.00	183,200.00	72,000.00	67,000.00	600,900.00	600,900.00	

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

OUTPUT	ACTIVITY	BUDGET CATEGORY	BUDGET BY YEAR						USD	USD	
			2018	2019	2020	2021	2022	2023			
			USD	USD	USD	USD	USD	USD			
Output 2.1 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 and sanitation technologies	Consultant			48,000.00	-			48,000.00	365,600.00	
		Travel			9,000.00	-			9,000.00		
		NGO:			50,000.00	50,000.00	50,000.00	-	150,000.00		
		Workshops / Meetings / Forums		13,800.00	13,800.00	13,800.00	-	-	41,400.00		
		Training Materials			50,000.00		30,000.00		80,000.00		
		Community Consultations / Trainings		12,400.00	12,400.00	12,400.00	-	-	37,200.00		
		Other							-		
SUB-TOTAL			-	26,200.00	183,200.00	76,200.00	80,000.00	-	365,600.00	365,600.00	
Output 2.2 Water Harvesting and Storage System (WHSS) repaired and installed in 6 atoll islands	Activity 2.2.1. Carry out ground-truthing assessments	Travel		60,000.00	-				60,000.00	102,400.00	
		Field costs (transport, fuel etc)		20,000.00	-				20,000.00		
		Equipment		10,000.00	-				10,000.00		
		Community Consultations		12,400.00	-				12,400.00		
		Other							-		
	SUB-TOTAL			-	102,400.00	-	-	-	-	102,400.00	102,400.00
	Activity 2.2.2 Repairing household rainwater harvesting and storage system.	Salary: Local builders			-	15,000.00				15,000.00	1,558,000.00
Outer Island Coordinators			24,000.00	24,000.00	24,000.00	24,000.00			96,000.00		
Equipment / Materials (wells & tanks)			33,000.00	1,100,000.00	-				1,133,000.00		
Transportation & Logistics (People & Materials)				140,000.00	140,000.00				280,000.00		
Workshops / Meetings / Forums				8,500.00	8,500.00				17,000.00		
Training (Community)				8,500.00	8,500.00				17,000.00		
SUB-TOTAL			-	57,000.00	1,281,000.00	196,000.00	24,000.00	-	1,558,000.00	1,558,000.00	
Activity 2.2.3. Constructing community rainwater harvesting and storage systems.	Salary: Local builders			-	11,250.00	11,250.00			22,500.00	396,500.00	
	Travel			-	30,000.00	30,000.00			60,000.00		
	Equipment / Materials (wells & tanks)			130,000.00	150,000.00				280,000.00		
	Workshops / Meetings / Forums			-	8,500.00	8,500.00			17,000.00		
	Community Consultations			-	8,500.00	8,500.00			17,000.00		
SUB-TOTAL			-	-	130,000.00	208,250.00	58,250.00	-	396,500.00	396,500.00	
Activity 2.2.4. Implementation of a monitoring and maintenance programme	Travel			35,000.00	42,000.00	43,500.00			120,500.00	402,500.00	
	Equipment: Water quality			28,000.00	28,000.00	28,000.00	28,000.00		112,000.00		
	Training			8,500.00	8,500.00	8,500.00	8,500.00	8,500.00	34,000.00		
	Community Consultations (Mngt Plans)			8,500.00	8,500.00				17,000.00		
	Consultant			54,000.00	18,000.00				72,000.00		
	Communications: Publishing / Printing			15,000.00	15,000.00				30,000.00		
	Workshops / Meetings / Forums			8,500.00	8,500.00				17,000.00		
	Other								-		
SUB-TOTAL			-	63,000.00	164,500.00	130,000.00	36,500.00	8,500.00	402,500.00	402,500.00	
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.	Consultant			54,000.00	18,000.00			72,000.00	275,413.00	
		Equipment (SCT or other piloted)				60,000.00	60,000.00		120,000.00		
		Transportation & Logistics (Materials)				-	-		-		
		Community Consultations & Training			17,000.00	17,000.00	17,000.00	17,000.00	68,000.00		
		Training			8,500.00	6,913.00					15,413.00
		Other									-
SUB-TOTAL			-	-	79,500.00	101,913.00	77,000.00	17,000.00	275,413.00	275,413.00	
COMPONENT TOTAL				-	248,600.00	1,838,200.00	712,363.00	275,750.00	25,500.00	3,100,413.00	3,100,413.00

Component 3. Demonstration of adaptation measures for coastal communities in Kosrae State											
OUTPUT	ACTIVITY	BUDGET CATEGORY	BUDGET BY YEAR							USD	USD
			2018 USD	2019 USD	2020 USD	2021 USD	2022 USD	2023 USD	USD		
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	Consultant	-	450,000.00	200,000.00					650,000.00	788,000.00
		Travel		9,000.00	9,000.00					18,000.00	
		Survey work		120,000.00						120,000.00	
		SUB-TOTAL	-	579,000.00	209,000.00	-	-	-	788,000.00	788,000.00	
Output 3.2. Transitional coastal protection at Mosral and Paal upgrade for immediate coastal protection	Activity 3.2.1. Upgrade coastal protection works	Design and Construction			500,000.00	1,450,000.00	500,000.00			2,450,000.00	2,586,000.00
		Travel			18,000.00	18,000.00	9,000.00			45,000.00	
		Watershed protection				55,000.00	-			55,000.00	
		Community Consultations			18,000.00	18,000.00				36,000.00	
		Other								-	
SUB-TOTAL	-	-	536,000.00	1,541,000.00	509,000.00	-	2,586,000.00	2,586,000.00			
COMPONENT TOTAL			-	579,000.00	745,000.00	1,541,000.00	509,000.00	-	3,374,000.00	3,374,000.00	

Component 4. Knowledge management for improved water and coastal protection											
OUTPUT	ACTIVITY	BUDGET CATEGORY	BUDGET BY YEAR							USD	USD
			2018 USD	2019 USD	2020 USD	2021 USD	2022 USD	2023 USD	USD		
Output 4.1. 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	Consultant			30,000.00	30,000.00	-			60,000.00	335,600.00
		Travel			9,800.00	9,800.00	3,000.00	3,000.00	25,600.00		
		Communication Products		25,000.00	50,000.00	60,000.00	70,000.00	45,000.00	250,000.00		
		Other							-		
	SUB-TOTAL	-	25,000.00	89,800.00	99,800.00	73,000.00	48,000.00	335,600.00	335,600.00		
Activity 4.2.2 Capture and document data and information generated by the project	Database Management: INFORM			10,000.00	10,000.00	10,000.00	10,000.00	40,000.00	96,000.00		
	Staff: M&E Officer / Data Officer			14,000.00	14,000.00	14,000.00	14,000.00	56,000.00			
	Other							-			
SUB-TOTAL	-	-	24,000.00	24,000.00	24,000.00	24,000.00	96,000.00	96,000.00			
COMPONENT TOTAL			-	25,000.00	113,800.00	123,800.00	97,000.00	72,000.00	431,600.00	431,600.00	

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	
Sub-Total (Salaries)	48,220.00	140,000.00	140,000.00	140,000.00	140,000.00	-	608,220.00	608,220.00
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							-	
Sub-Total (Admin Expenses)	-	45,200.00	28,000.00	22,000.00	23,500.00	61,098.00	179,798.00	179,798.00
	48,220.00	185,200.00	168,000.00	162,000.00	163,500.00	61,098.00	788,018.00	788,018.00

Implementing Agency Fee

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

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
Total	1,248,485.60	1,999,909.99	2,655,184.88	2,953,763.73	142,655.80	-	9,000,000.00

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

A. Record of endorsement on behalf of the government⁴⁵

<i>(Enter Name, Position, Ministry)</i>	<i>Date: (Month, day, year)</i>
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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 (melaniek@sprep.org and filomenan@sprep.org)	

⁶. 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.

FSM Endorsement Letter

Kosrae State Endorsement Letter

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. Design services for Kosrae Inland Road Project: Preliminary engineering design report

Annex C. Environmental and Social Management Plan

Annex D. 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 E. 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 F. 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"> • Re-affirming community support of project priorities • Ranking of priorities of the project • Role of community, island governing council and representatives on island proper (main island) • Coordination mechanism of the department with other government departments and NGOS/IGOs
Consultative Meeting 1.2	24 June 2015	Chuuk stakeholders	<ul style="list-style-type: none"> • Community confirmation of project priorities • Ranking of priorities of the project by the community • Role of community, island governing council and representatives on island proper (main island) • Coordination mechanism of the department with other government departments and NGOS/IGOs
Consultative Meeting 1.3	25 June 2015	Yap stakeholders	<ul style="list-style-type: none"> • Community confirmation of project priorities • Ranking of priorities of the project by the community • Role of community, island governing council and representatives on island proper (main island) • Coordination mechanism of the department with other government departments and NGOS/IGOs
Consultative Meeting 1.4	6 July 2015	Kosrae stakeholders	<ul style="list-style-type: none"> • Community confirmation of project priorities • Ranking of priorities of the project by the community • Role of community, island governing council and representatives on island proper (main island) • Coordination mechanism of the department with other government departments and NGOS/IGOs
Consultative Meeting 2	16-19 November 2015 Palikir, Pohnpei,	Vice President, Secretary Department of Foreign Affairs, Secretary	<ul style="list-style-type: none"> • Update Infrastructure Development Plan for Kosrae State and FSM • Plan for FSM Development Partner's Forum meeting in March 2016 to

	Colonia, Pohnpei	Overseas Development Assistance, Secretary Ministry of Finance Governor Pohnpei Lieutenant Governor Pohnpei Director, EPA Pohnpei	secure donor support to co-finance and construct the Malem-Utwe road\ <ul style="list-style-type: none"> • Coordination and collaboration mechanisms between national and state levels
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"> • Updated Infrastructure Development Plan for Kosrae State • 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 • Review of CBA results, costings, and benefits of the Malem - Utwe inland • Identified potential risks of the Malem- Utwe inland road and agreed to carry out an Environmental Impact Assessment (EIA)
Consultative Meeting 3	24-26 November 2015 Kosrae State	Kosrae State Government, NGO, IGO stakeholders	<ul style="list-style-type: none"> • Improved the accuracy and usefulness of the cost benefit analysis • Developed the IRRI program • Formulated 'logic model' and developed monitoring and evaluation framework of the IRRI program
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"> • Legislature approval of Malem-Utwe inland road as one of two high infrastructure priorities of the state • Review of CBA results, costings following consultation meeting with Kosrae stakeholders (consultative meeting 3) • Developed Terms of Reference for EIA
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"> • Considered the Government of China as a potential donor to co-finance and construct the Malem-Utwe road

		<p>Secretary Resources & Development,</p> <p>United States Embassy</p> <p>Secretariat of the Pacific Community (SPC) Deputy Director General</p>	<ul style="list-style-type: none"> • Coordination and collaboration mechanisms between national and state levels • Coordination between national, state and US Compact activities related to infrastructure priorities of states • 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)
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 & Development,</p> <p>United States Embassy</p> <p>Secretariat of the Pacific Community (SPC) Deputy Director General</p>	<ul style="list-style-type: none"> • Considered the Government of China as a potential donor to co-finance and construct the Malem-Utwe road • Coordination and collaboration mechanisms between national and state levels • Coordination between national, state and US Compact activities related to infrastructure priorities of states • 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)
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"> • Training of Agriculture Extension Officers for outer islands • Potential outer island activities on Food Security activities • Raised taro patches technology for outer islands • Coordination and collaboration with Food Security related projects
Consultative Meeting 4.1	20-22 January 2016	Yap stakeholders	<ul style="list-style-type: none"> • Trained government and community stakeholders on logic model and development of the Monitoring & Evaluation Framework • Re-confirmed community priorities for the outer islands • Formulated 'logic model' and developed the MEF for water security, marine resource management and food security priorities

			<ul style="list-style-type: none"> Identified no potential social, economic, and environmental risks to any of the activities of the project
Consultative Meeting 4.2	26-28 January 2016	Chuuk stakeholders	<ul style="list-style-type: none"> Trained government and community stakeholders on logic model and development of the Monitoring & Evaluation Framework Re-confirmed community priorities for the outer islands Formulated 'logic model' and developed the MEF for water security, marine resource management and food security priorities Identified no potential social, economic, and environmental risks to any of the activities of the project
Consultative Meeting 4.3	1-3 February 2016	Pohnpei stakeholders	<ul style="list-style-type: none"> Trained government and community stakeholders on logic model and development of the Monitoring & Evaluation Framework Re-confirmed community priorities for the outer islands Formulated 'logic model' and developed the MEF for water security, marine resource management and food security priorities Identified no potential social, economic, and environmental risks to any of the activities of the project
Follow Up Meeting 2.1	3 February 2016	Vice President FSM, ODA, R&D, MOF, OEEM, DFA	<ul style="list-style-type: none"> Brief update of the proposal Further discussions with Government of China' support for co-finance and construction of the road to the tune of \$5m USD in technical assistance Confirmed support for an environmental impact assessment required for the project.
Consultative Meeting 5	23-27 May 2016	Malem and Utwe communities of Kosrae – via the EIA process	<ul style="list-style-type: none"> 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"> 1. The location of the road and construction resulting in increased sediments or other contaminants entering the Palusrik River and the Utwe water supply.

			<ul style="list-style-type: none"> • 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. • 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.
Follow Up Meeting 3.1	20 June 2016	Vice President FSM, DFA, ODA, OEEM; US Embassy	<ul style="list-style-type: none"> • Brief update of the proposal – appraisal stage • Letter confirming co-financing support pursued by national government at the November 2016 FSM Development Partner's Forum Meeting
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"> • Brief update of the proposal • Support to development of the proposal to SPREP provided by the USAID ADAPT Asia-Pacific Project • 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 • Re-affirmation of the priorities of the project by the Utwe Municipal government, women, men, elders, and youth of the community of Malem
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"> • Brief update of the proposal • Support to development of the proposal to SPREP provided by the USAID USADAPT Asia-Pacific Project • IPIC, ODA acknowledgement of endorsement by Kosrae State of the

		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"> • Re-affirmation of the priorities of the project by the Utwe Municipal government, women, men, elders, youth, landowners of the community of Utwe
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"> • Visited Palusrik catchment in Utwe municipality • Visited inland roads that are accessible of the Malem-Utwe inland road stretch, including Kuplu Wan plateau • Visited all access routes coastal-inland • Visited PACC Tafunsak climate-proof road

