

Annex 7

Summary of Consultations and Stakeholder Engagement Plan

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Enhancing Climate Information and Knowledge Services for resilience in 5 island countries of the Pacific Ocean

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Introduction

The Stakeholder Engagement Plan consists of a report on in-country fieldwork and consultation, an analysis of the interests of each country's principal stakeholders and a table outlining a proposed schedule of engagements with stakeholders throughout the term of the Programme.

In-country consultations were undertaken to confirm the structure and composition of the Programme Funding Proposal, using the approved Concept Note as the basis for wide-ranging discussions with an extensive group of stakeholders. The outcome of these discussions is provided in detail, with a summary agreed with each country's NDA. The analysis of major stakeholders' roles in each country considers their interest in the Programme, their influence on it, their proposed role in the activities, and the approach the Programme will take to ensuring their effective engagement. The Stakeholder Engagement Activity Timetable suggests a schedule for engaging formally with the principal stakeholders, which will be confirmed or modified by the PMU and each country's PIU during the inception phase. More detailed schedules and methods of reporting on interactions will be agreed during the inception phase by the PMU and the Executing Entities (EEs) in each country.

The Cook Islands, Niue, Palau, the Republic of the Marshall Islands and Tuvalu are small, mainly low-lying atoll island countries and are at the forefront of climate change. Sea level rise, ocean acidification, coastal inundation and erosion, disruption of rainfall patterns, rising average temperatures and more extreme weather events now threaten the ecosystems on which island populations rely. As their climate becomes more chaotic and unpredictable, communities seek reliable, timely advice on their local weather and climate in understandable formats, and science-based advice on planning for longer term impacts. The governments of the five countries consistently raise the same issues at regional and international forums, stating that of all the development challenges they face, addressing climate change is their highest priority.

The economies of all five countries depend heavily on subsistence and commercial agricultural enterprises which, as well as their growing tourism sectors, are very climate sensitive. Their economies are small and narrowly based, remote from markets, and they rely on remittances from relatives working overseas, support from development partners and licences for fishing in their exclusive economic zones to provide essential services to their populations.

Sophisticated, centuries-long traditional knowledge of their local climate has carried Pacific islanders through many periods of sometimes extreme climate variability. Their present vulnerability to climate change arises from their geography, the exposure of their populations and their lack of resilience to shocks; their limited adaptation capacity is caused by structural constraints on their financial and human resources.

Cook Islands

The Cook Islands consists of 15 small islands scattered over almost 2 million square kilometres of the Pacific Ocean, northeast of New Zealand, between French Polynesia and American Samoa. Its geographical location means the Cook Islands is highly vulnerable to natural disasters, particularly tropical cyclones, storm surge, flooding and drought. The low elevation of many of its inhabited islands contributes to its vulnerability. Extreme events readily become natural disasters because of the Cook Islands' widely dispersed land masses, limited communications capacity and dependence on subsistence agriculture, fishing and tourism.

All coastal areas in the Cook Islands are at risk from extreme rainfall events, storm surges and damaging winds, but the risk levels for fixed assets along the north coast of Rarotonga are particularly high. Exposure to approaching cyclones and the associated storm waves and strong winds combines with a high concentration of valuable fixed assets: the northern coast has the centre of government, commerce, culture and transport (sea and air) for the country. Structures in Avatiu–Rarotonga have an estimated replacement value of NZD48 million.

Effects of disasters on the natural environment and communities tend to be long-lasting, with high rehabilitation and recovery costs. Risks and impacts can differ between the low atoll islands and the higher volcanic islands with their richer soils and more varied ecosystems, but both are highly susceptible to damage from strong winds and the storm surge associated with tropical cyclones. All the Cook Islands experience persistent coastal erosion that threatens roadways, agro-forestry production, habitable dwellings, and shallow coastal aquifers.

Niue

Niue is one of the largest raised coral atolls in the world, with no mountains or rivers, little arable land and limited natural fresh water supplies. It is a single island, with two distinct levels: a plateau in the centre of the island reaches about 60 m above sea level and is surrounded by limestone cliffs. The lower level is a coastal terrace about half a kilometre wide and about 25 m high, sloping down to meet the sea at small cliffs with many limestone caves. Its surrounding reef has a single navigable break near the capital, Alofi. Niue has a land area of 259 km² and is situated in the southwest Pacific Ocean about 2,400 km northeast of New Zealand. Its population of approximately 1618 (July 2017 estimate) is spread across 14 villages.

Aid accounts for 70% of Niue's GDP. Other financial resources include agricultural exports, taxation, fishing licences, international lease of Niue's unique four-digit phone numbers, remittances from Niueans working abroad and additional support from development partners.

Niue is extremely vulnerable to natural disasters—it is still recovering from a devastating cyclone in 2004 that destroyed most of the island's infrastructure. Its lack of fresh water and its remoteness mean its resilience is very low. Niue's coastal waters have already increased in both surface temperature and acidity levels as a result of climate change. The results include increased incidences of coral bleaching and die-off, causing changes to fish spawning and breeding grounds and reduced barrier protection (provided by reefs) against storm surges. Fish species critical for food security, such as deep-water tuna, are migrating to higher latitudes and away from Niuean waters. This development is particularly concerning to the Government of Niue, since most households are reliant on fish caught in Niuean waters, mostly through subsistence fishing and a significant component of Niue's income comes from the sale of fishing licences. The impacts of these changes represent a very significant risk to Niue, and its ability to respond effectively to minimise or avoid the risk is minimal.

Palau

The Palau archipelago is made up of about 340 islands, most of which are remnants of a tectonically uplifted coral reef, covering 466 square kilometres of ocean. The curved island chain runs for 150 km from north to south and is 25 km across at its widest point. All but six of Palau's islands lie within an expansive lagoon, enclosed by the barrier reef, that stretches northeast to southwest for almost 115 km. Babelthuap, the largest island (396 square km), is volcanic, bounded by thick mangrove forests broken occasionally by sandy beaches on the east coast. Its highest point, Ngerchelchuus, in the northwest, is 242 metres high. Twelve of Palau's islands are permanently inhabited.

Palau's economy is based mainly on tourism, subsistence agriculture and fishing, with a significant portion of gross national product derived from foreign aid. Since the end of World War II, the major employer in Palau has been government—first the U.S. Navy, then the Trust Territory of the Pacific Islands, and finally the Government of Palau. In the rural areas outside Koror the subsistence economy is active: taro, sweet potato and cassava are cultivated, and nearshore reef fishing is important. Offshore tuna fishing by foreign vessels provides a small amount of government revenue through the sale of licenses. Tourism contributes 45–55 percent of Palau's gross domestic product and is reliant on the great natural beauty and biological diversity of its islands, lagoons and reefs. Frequent natural hazards (mainly typhoons, droughts, and tidal surges), can disrupt economic activity, including tourism, and lead to loss of livelihoods, diversion of fiscal resources, and disruption of development priorities.

Since 2012, Palau has declared three states of emergency related to natural hazards. In 2012, Typhoon Bopha caused about USD6.3 million in initial damages (2.9% of GDP). In 2013, initial damage from Typhoon Haiyan was estimated to be USD8.5 million (3.7% of GDP). In 2016, a severe drought associated with El Niño weather conditions led to water shortages across Palau and generated significant sanitation and hygiene risks. The city's only dam had dried up and the only alternate source of water, the Ngerikiil River, was at 19 percent capacity. Children were hungry and dehydrated, and health risks were high due to crop failure, water shortages and poor sanitation. The drought also led to the closure of Jellyfish Lake, a major tourist attraction. Consequently, GDP growth is estimated to have fallen to minus 0.5% in FY2017 as tourist arrivals declined.

Marshall Islands

The Republic of the Marshall Islands (RMI) is about halfway between Hawaii and Australia, just north of the equator in the North Pacific Ocean. It is a group of 34 major islands and atolls, of which 22 are inhabited, spread out in an archipelago of two parallel chains, the eastern *Ratak* (sunrise) chain and the western *Ralik* (sunset) chain. The average elevation of its islands is about two metres above sea level and the highest recorded point in the group is ten metres above sea level. RMI's exclusive economic zone covers 1.9 million km² of ocean, though its total land area is only 181 km², accommodating a population of about 58,413 in 2018. About 70% of the population lives either on Kwajalein in the western group or in the capital, Majuro, in the eastern group.

RMI faces significant development pressure arising from extremely high population densities in the urban centres, high levels of poverty, a dispersed geography of atolls over a large ocean area (making communication difficult and transportation expensive), and a small island economy that is physically isolated from world markets but highly susceptible to global influences. Environmental pressures are also acute, with low elevation, fragile island ecosystems, a limited resource base and scarce freshwater resources resulting in an environment that is highly vulnerable

to overuse and degradation. It is in a relatively quiet seismic area, but is surrounded by the Pacific “ring of fire” and has been struck by devastating tsunamis after distant earthquakes in the past.

RMI's coastal waters have increased in both surface temperature and acidity levels as a result of climate change, causing increased coral bleaching and die-off, changes to fish spawning and breeding grounds and reduced barrier protection against storm surges. Changes in currents and warmer water temperatures may also induce further risks to marine life, such as increased invasive species. These impacts combine with non-climate factors such as over-fishing of the reef flats in a context where demand for fish already far outstrips supply.

Shoreline erosion caused by sea level rise is already a significant problem across the Marshall Islands and complete inundation is increasingly a real concern, as it is for other low-lying Pacific atoll countries. As long ago as 1992, NOAA advised that defence against a once-in-50-years storm event was becoming impossible.

Tuvalu

Tuvalu consists of nine small islands (Niulakita, Nukulaelae, Funafuti, Nukufetau, Vaitupu, Nui, Niutao, Nanumaga and Nanumea) with a total land area of about 26 km² scattered over 500,000 km² of the western Pacific, about half-way between Australia and Hawaii, and very close to the equator. Six of the islands are low lying atolls made up of islets fringing the edges of lagoons. Nanumaga, Niutao and Niulakita are raised limestone reef islands. All of the islands' soils are generally of poor quality, supporting a limited variety of flora.

At its highest point, the country is just 4.5 metres (15 ft) above sea level, making it the second lowest-lying nation in the world (after the Maldives), and thus highly vulnerable to sea level rise. Few of its atolls have land areas more than 800 m wide. The country has already begun to experience extreme high “king tides” that raise the normal sea level and cause flooding in low-lying areas. It is estimated that a rise in sea level of between 20 to 40 cm over the next century could submerge the nation entirely.

Environmental issues add to Tuvalu's challenges. Until this century, Tuvalu's islands, like other inhabited atolls, had a usable lens of fresh water replenished by rainfall and accessible from wells, floating on the layer of saltwater that permeates its porous, sandy soils. People are now dependent on rainwater captured from small areas of corrugated iron roofing and stored in tanks as their main source of drinking water, because the groundwater has been polluted by saltwater intrusion and human activity and is no longer fit for human consumption or agriculture.

Proposed GCF Programme

The Programme has three key outcomes: i) Governments implement policies, plans and actions based on timely and credible climate information and risk analysis; ii) : Integrated climate information and early warning systems in place and sustained in Cook Islands, Niue, Palau, Republic of the Marshall Islands and Tuvalu; and iii) Communities adopt new climate resilient livelihood practices by using improved climate information and risk knowledge. These outcomes will be achieved through four inter-related Results Areas, which each comprises a set of activities and sub-activities designed to achieve the outcomes.

Result 1: Strengthened delivery model for climate information services and MHEWS covering oceans and islands

Programme Result 1 will assist each country to establish a coherent National Framework for Climate Services (NFCS) to coordinate, facilitate and strengthen collaboration among national institutions for enhanced climate information services and products, supported by effective coordination mechanisms to integrate climate information and disaster risk knowledge into the decision-making of climate-sensitive sectors. Continuing, regular stakeholder engagement will inform the development of tailored, accessible products and services that serve the practical needs of end users. This will lead to increased understanding of and use of NMHSs' information and advice, and reduced losses from climate variability and extreme events. Moreover, NMHS staff will gain cumulative experience in communicating with non-scientists to achieve practical outcomes and ensure that essential climate information reaches “the last mile”.

Long-term sustainability of climate services and disaster risk management will be achieved through strengthened institutional and stakeholder partnerships as a result of the NFCSs, identification of opportunities for private sector engagement and investment based on detailed market assessments, and the development of financial policies to ensure that the five NMHSs have the means to sustain and ensure the ongoing operation of their mandated services in order to mitigate weather-, climate-, and water-related risks. This will facilitate national climate funding, including through cost-recovery mechanisms from sectors, where feasible, beyond the Programme's lifespan, based on the value chain approach.

Result 2: Strengthened observations, monitoring, modelling and prediction of climate and its impacts on ocean areas and islands

Programme Result 2 will enable the five countries to expand their observation networks with robust and well-supported equipment, collecting data from critical sites such as distant inhabited outer islands and from ocean areas. Enhancing observation and monitoring network will build the foundation for full compliance of the five countries with the requirements of the WMO Global Basic Observing Network (GBON), which “represents a new approach in which basic surface-based observations are designed, defined and monitored at the global level” and emphasises

the need for access to 24/7 global observations as a global public good. Installation and capacity building for weather radar observations will further enhance extreme weather monitoring and early warning systems, and support validation of Numerical Weather Prediction (NWP) forecasts. An improved observation system in the tropical Pacific will not only benefit the host countries but also the entire global forecasting capability. One of the most significant activities in this Programme will be to establish end-to-end ocean services. This is a major priority for Pacific NMHSs, in response to user demand for ocean climate information, particularly relating to fishing conditions and safety. The ocean is a fundamental climate regulator and is the major influence on the climate of small, isolated islands, but the small economies of the Programme countries render most modern equipment and consumables infeasible to obtain.

This Result will support the implementation of the Global Framework for Climate Services (GFCS) helping to address deficiencies in the Observation and Monitoring Pillar of the GFCS in Cook Islands, Niue, Palau, RMI and Tuvalu. This is fully in line with the Pacific Roadmap for Strengthened Climate Services 2017–2026, which proposes several regional and national actions within the GFCS pillars.

The main focus of this Result is on transforming the five NMHSs from WMO's Basic–Category 1 level to WMO's Essential–Category 2 level. Generally, Category 1 NMHSs can provide basic weather and climate services to their countries through delivering a basic range of climate data and products, participating in regional climate forums and engaging in limited interactions with end-users. At Category 2 level, the NMHSs will be able to:

- Deliver a basic range of climate services and products;
- Provide climate predictions;
- Participate in climate forums;
- Interact with end-users from different sectors;
- Gather feedback on the information that end-users provide;
- Have well-established protocols for emergencies, backup of data and some off-site facilities;
- Have climate observers and meteorologists trained to WMO standards;
- Have 24/7 operation (where possible);
- Have a well-established Quality Management System (QMS); and
- Have access to most Numerical Weather Prediction (NWP) data/products from other centres.

Result 3: Improved community preparedness, response capabilities and resilience to climate risks

Programme Result 3 contributes to the attainment of the overall Goal of the Sendai Framework for Disaster Risk Reduction: “The substantial reduction of disaster risk and losses in lives, livelihoods and health and in the economic, physical, social, cultural and environmental assets of persons, businesses, communities and countries”. In particular, the Programme will contribute to the Framework’s Global Target (g) “Substantially increase the availability of and access to multi-hazard early warning systems and disaster risk information and assessments to people by 2030”.

The Programme will also contribute to the outcomes of the 2019 UN Climate Action Summit, in particular targets 3 and 4 of the Risk-informed Early Action Partnership (REAP) on investment in “early warning system infrastructure and institutions to target early action in ‘last/first mile’ communities” and “more people are covered by new or improved early warning systems...”.

Furthermore, this Result will introduce Forecast-based Financing (FbF) in the five countries as an innovative mechanism whereby early actions at community and government level are pre-planned based on credible forecasts, and are funded and implemented before a climate shock to minimise losses and damages caused by climate-related hazards and reduce the need for humanitarian assistance in their aftermath.

Result 4: Enhanced regional knowledge management and cooperation for climate services and MHEWS

Programme Result 4 will optimise synergies among the Cook Islands, Niue, Palau, the Republic of the Marshall Islands and Tuvalu. Benefits of the multi-country approach include: i) facilitation of strategic partnerships, stronger relationships and collaboration; ii) cost efficiency, ease of planning and coordination; iii) knowledge sharing; iv) increased awareness of the Programme, leading to increased likelihood of replication of community interventions across the region; v) South-South cooperation modalities enhancing the multiplier effects of the Programme. To this end, the Programme will organise joint learning events and training; promote equipment, software and tools common to all five countries; and foster networking and mentoring among the five NMHSs. The Result will directly address the key education and training needs – such as Forecasting and Numerical Weather Prediction (NWP), Instrumentation and Observation and Climate Services – reported by Pacific NMHSs to WMO and in a study conducted by the Disaster Resilience for Pacific SIDS (RESPAC) project.

This regional approach will ensure optimal knowledge management by sharing lessons learned and information on best practices. Programme Result 4 will complement and build on existing mechanisms for the entire Pacific region such as the newly established Pacific Climate Change Centre (PCCC), the Pacific Meteorological Council (PMC), the Regional Climate Outlook Forum, WMO regional meteorological centres and training and regional learning institutions such as the University of the South Pacific (USP) and its Pacific Centre for Environment and Sustainable Development (PaCE-SD). The Result takes advantage of the already established GEF-funded “Inform” project, implemented by UNEP and executed by SPREP, which is helping 14 Pacific island countries to manage and use environmental data well (discussed under Programme

Result 2). The Result will facilitate sharing of successes and lessons on the communication of climate-related information throughout the implementation of the Programme and foster South–South collaboration.

Roles of stakeholders

The Programme will need the direct involvement of a diverse range of stakeholders for each of its components to be successful. Result 1 will need the active engagement of staff in key ministries in the (consultant-facilitated) design of the Framework for Climate Services and in regular revisions of the agreed services. In subsequent years, private sector partners and civil society organisations will need to be engaged in a similar process. The second Result area will need commitment from NMHSs and regional partners to ensure recruitment of staff is expedited and training is undertaken, so that new equipment can be used and maintained, and the additional data is fully exploited. The third Result includes detailed plans for very interactive engagement with communities throughout each country. All the identified stakeholders have substantial capacity to influence the project positively or negatively. These stakeholders were all consulted during the preparation of the Feasibility Study and the Funding Proposal.

The stakeholder engagement plan (SEP) for each country has been prepared and will be applied to all components of the proposed Programme to ensure the continuing participation of stakeholders throughout its implementation. This plan will serve to ensure appropriate consultation of and coordination with all the stakeholders while implementing project activities, as well as the inclusion of their specific interests and concerns. The SEP provides guidelines for stakeholder engagement and all third parties are expected to follow these guidelines while executing their activities. The SEP is a flexible plan and will be revised and updated by the Programme Implementation Unit if necessary, during the Programme's lifetime.

This proposed GCF project is fully aligned with national government priorities and regional strategies. It addresses key concerns about adaptation to climate change in the five countries and builds on lessons learned and best practices for the provision of climate information services.

Regulations and requirements

Each country has obtained formal permission from customary landowners for the use of land, where necessary, to install additional observing equipment.

Summary of previous stakeholder engagement

Stakeholders have been consulted through the development of this Programme proposal in several stages. In 2018 the five partner governments indicated their interest in working with UNEP to develop a proposal supporting improved climate information services and provided relevant information—national and regional strategies and policy documents, recommendations as to areas of concern, potential activities and so on. UNEP drafted the Concept Note and circulated it to the five countries' National Designated Authorities for interaction with the Green Climate Fund for their consideration.

In-country fieldwork

When the Concept Note was endorsed by the NDAs and approved for further development by the GCF, UNEP engaged consultants from Pacific Science Solutions (PSS) to undertake the fieldwork required for Feasibility Studies with each partner country and the development of a Funding Proposal. The consultation process refined the range of potential activities suggested in the Concept Note to align with each country's highest priorities and most practicable inputs. There is a lot of commonality among the countries in the kind of interventions they believe are most likely to succeed and to effect lasting change.

Cook Islands

The consultants visited Rarotonga on 23–26 March 2019 and held meetings with the Cook Islands Meteorology Service (CIMS) and their key national stakeholders (refer to Table 1). Stakeholders were invited to share their knowledge and ideas and provide detailed input on potential interventions and activities for Cook Islands under the Concept Note components. The report summarises the priority issues arising from the face-to-face meetings with each sector stakeholder.

The consultants met nine representatives of multiple departments within Cook Islands Ministries and Offices including the Office of the Prime Minister, the Ministry of Marine Resources, the Ministry of Agriculture, the Climate Change Department, Marae Moana Division and the Cook Islands Meteorological Services.

Table 1 shows the Stakeholder Engagement Schedule proposed by the Cook Islands Meteorology Services, **Table 2** lists the Representatives met and **Table 3** is the Stakeholder Table.

Table 1: Cook Islands Stakeholder Engagement Schedule

Dates	Stakeholders
Saturday, March 23, 2019	1.45 pm: Arrival of PSS Team in Rarotonga 3:00 pm: Briefing meeting with Director, Meteorological Services and Director, Climate Change Cook Islands (NDA)
Monday, March 25 2019	9:00 am: Climate Change Challenges platform meeting
Tuesday, March 26, 2019	8:00 am: Ministry of Marine Resources (MMR) 9:00 am: Ministry of Agriculture 11:00 am: Climate Change Cook Islands – Office of the Prime Minister (OPM) 2:00 pm: Cook Islands Meteorological Services
Wednesday, March 27, 2019	9:00 am: Pa Enua Action of Resilient Livelihood (PEARL) 1:30 pm: Emergency Management Cook Islands (ECMI) 4:00 pm: Ministry of Agriculture – Field Visits to Organic Farmers
Thursday, March 28, 2019	9:00 am: Au Vaine Kumiti 12:00 pm: Ministry of Cultural Development

	1:00 pm: Emergency Management Cook Islands (ECMI)
Friday, March 29, 2019	11:00 am: Ministry of Environment 2:00 pm: Director, Climate Change Cook Islands (NDA) 5:00 pm: Cook Islands Ports Authority
Sunday, March 31, 2019	2:55 pm: Departure of PSS from Rarotonga

Table 2: Participants at Cook Islands country engagement

	Participant	Position
1.	Arona Ngari	Director, Meteorology Services
2.	Pamela Maru	Secretary, Ministry of Marine Resources
3.	Wayne King	Director, Department of Climate Change
4.	Jacqueline Evans	Director, Marae Moana
5.	Brian Tairea	Ministry of Agriculture (Organic Farmers)
6.	Celine Dyer	Coordinator, Department of Climate Change
7.	Melina Tuiravakai	Pa Enua Action for Resilient Livelihoods (PEARL) Project Coordinator, Department of Climate Change
8.	Rima Moeka'a	Department of Climate Change
9.	Bates Manea	Senior Observer, Cook Islands Meteorology Service
10.	Brian Tairea	Senior Extension/Advisory Officer, Ministry of Agriculture
11.	Rangi Mitaera-Johnson	PEARL staff member and pearl farmer
12.	Charles Carson	Director, Emergency Management Cook Islands (EMCI)
13.	Timoti Tangiruaiane	GIS Expert, Emergency Management Cook Islands (EMCI)
14.	Organic Farmer 1	
15.	Organic Farmer 2	
16.	Lydia Sijp	Secretary General for Civil Service Organisations and Au Vaine Kumiti member

17.	Noorooa Doherty	Au Vaine Kumiti member
18.	Nga Teao-Papatua	Au Vaine Kumiti member
19.	Helen Tutuava	Au Vaine Kumiti member
20.	Repeta Puna	Director of Governance, Ministry of Cultural Development
21.	Louisa Karika	Deputy Director, National Environment Service
22.	Noorooa (Bim) Tou	General Manager, Cook Islands Ports Authority
23.	Andre Tuiravakai	Asset & Operations Manager, Cook Islands Ports Authority

The consultants started their in-country consultations in a briefing meeting with Arona Ngari, Director of the Cook Islands Meteorological Services, and Wayne King, Director of the Department of Climate Change and the National Designated Authority for GCF. This was followed by meetings with representatives and heads of departments of the invited sectors. The PSS team introduced the background and proposed programme components, and the objectives of the in-country stakeholder consultation. Sector representatives were given an opportunity to share their input on departmental and sector barriers to accessing and using climate services. Each meeting included in-depth discussion on departmental functions and the climate and ocean related sector-specific products and services it required. Potential interventions and tools that build on past and current development initiatives to enhance sustainability were discussed, as well as national institutional arrangements that would strengthen access, delivery and use of climate and ocean information and knowledge services for key agencies and communities in the Cook Islands.

Summary of Key Discussion Issues

IT maintenance and amalgamation of technical services in CIMS.

- Costing by the Department of Climate Change of the impacts of climate change on infrastructure;
- Ocean monitoring capacity for severe weather and tsunami events for CIMS;
- Requirement for an observation station on Palmerston Island;
- Establishment of a forecasting unit within CIMS;
- Portable tide gauge, tide calendar and mean sea level for outer islands such as Penrhyn and Pukapuka;
- Recruitment and support for an oceanographer for CIMS;
- More regular Ocean Bulletin to be issued by CIMS;
- Development of a climate and ocean training package for communities;
- In-situ observations to support Fisheries and Mariculture in communities;
- Near-coast / just outside the reef monitoring;

- Supply of lagoon monitoring buoys;
- Establishment of an Agrometeorology Station;
- Development of a simple Agro-bulletin; and
- Annual National Climate Outlook Forum.

The importance of building on current and ongoing projects, initiatives and tools was also discussed. Related activities include:

- the Cook Islands' GCF Country Programme—adopted by Cabinet in March 2019 lists potential projects for funding valued at NZD 203 million in areas including coastal management and water resources. It will be essential to coordinate closely with this Programme;
- UNDP-RESPAC has funded the installation of nine CLEWS at Pa Enua (the outer islands) to facilitate the monitoring of climate and weather. Manihiki's CLEWS was installed in March 2019 and Palmerston, Nassau and Suvarrow islands will follow;
- the Building Safety and Resilience in the Pacific (BSRP) project - a €19.36 million project supported by the European Union that supports the development of a climate change portal;
- CLiDE database management;
- SPREP's Inform Project, which is helping Pacific countries retrieve, clean and use environmental data and information;
- PALM stockpile mapping tool;
- SCOPIC training; and
- NCOF and OCOF processes.

Discussion with stakeholders elicited the following suggestions:

- Develop National Framework for Climate Services;
- National Data Strategy Workshop with a Strategic Action Plan;
- Hazard maps, household surveys and input into GeoPortal;
- Soil moisture, grass and ground temperature measurement at 2 Organic Farms in Rarotonga (DoA);
- Case study on increasing carbon intake of crops using bio-agriculture (DoA);
- Sector workshop for agriculture to create a special agro-climate bulletin with advisories for farmers (DoA);
- Sector workshop on oceans lead by CIMS oceanographer with support from SPC based on a CIMS ocean climate outlook (CIMS);
- Conduct annual National Climate Outlook Forum (NCOF);
- Refurbishment of CIMS building—rewiring of electrical facilities to CIMS and complementing this with renewable energy as a prime source of electricity, upgrade of current hardware and software to latest model;

- Consumables for upper air program, install a DigiCORA Receiver on Rarotonga to cater for GPS sondes, purchase balloons and radiosondes for the Upper Air Program, upgrade the proton generator as storage tanks to give quality gas for filling balloons;
- Funding for technical support for CIMS technical staff, provision of tools and equipment to enable installation and maintenance of equipment;
- Portable tide gauges for Aitutaki, Mauke and Pukapuka, analyse data to produce mean sea level and local tide calendars;
- Ocean monitoring for severe weather and tsunamis, install two moored buoys to the west of Rarotonga, analyse data to produce mean sea level and marine weather information for community awareness;
- Ocean monitoring equipment for inter-island ships, install automatic weather stations on inter-island shipping vessels so as to report regularly on the weather in open waters, contribute data to the forecasting of weather events for Rarotonga and the Southern Cook Islands;
- Ocean monitoring both near shore and offshore for sediment transfer, ocean turbidity and ocean acidification;
- AWS equipment at four ports, establish in-situ and remote sensing for lagoon areas;
- Recruitment of an oceanographer, oceanography attachment at science institution;
- Support for the GeoPortal (EMCI);
- Recruit national INFORM Manager (NES), local NES staff to coordinate the national INFORM database, manage input from all partners and ensure alignment with other portals, quarterly INFORM and data management co-ordination meetings;
- Undertake a detailed priority project climate risk and economic assessment on the incremental cost of climate change in the Cook Islands, capacity building for an Asset Climate Risk Assessment and incremental cost of climate change, general assessment of all Cook Islands assets;
- Traditional Knowledge project on climate and oceans, collection of information for the production of island lunar month calendars; and
- Recruitment of a communications officer for CIMS, training for outer islands on understanding climate change and ocean climate information and output from AWSs, develop materials for training in the Pa Enua.

Table 3: Cook Islands Stakeholder Table

Stakeholder	Interest in the Programme	Influence on the Programme	Proposed role in the Programme	Engagement strategy
All Ministries and Government Departments	The Cook Islands Government is a primary beneficiary of all Programme interventions: the Programme's objective is to facilitate the flow of climate information that government agencies will use to increase CI's resilience to climate change impacts.	<p>The support of senior ministry officials will be essential to the success of the National Framework for Climate Services. They must be able to see tangible benefits for their departments from mainstreaming climate information into their policies and planning functions.</p> <p>The support of all ministry staff will be essential to the implementation of the NFCS. The mainstreaming of climate information into their work must address their own priorities for improving their services to communities.</p>	<p>The active engagement of government staff will be critical to the following activities:</p> <ul style="list-style-type: none"> • Working with the national Programme Manager, CIMS and consultants to understand how climate considerations can be mainstreamed into the work of their agencies; • Using good quality science and evidence-based information on long-term climate change in planning infrastructure and other development investments and avoiding maladaptation; • Identifying a suite of directly applicable information products relevant to their work; • Participating in a consultative workshop to develop and refine a National Framework for Climate Services; • Agreeing a process for checking the utility of information products regularly and revising them when needed; and • Proactively raising obstacles to mainstreaming with the Programme team throughout the term of the Programme. 	<p>Engagement ensured through:</p> <ul style="list-style-type: none"> • Workshopping the design of the National Framework for Climate Services with CIMS and a facilitator; • Technical support and staff training provided to sector focal representatives on climate science, community consultation techniques, etc; and • Opportunities to deliver targeted face-to-face advice to island communities on the implications of climate change in their sector.
Rarotonga and outer island communities	Communities are one of the ultimate beneficiaries of all Programme interventions: the Programme's objective is to facilitate the flow of climate information that communities will use to	All CI's communities are affected by long term climate change impacts—sea level rise causes erosion and salting of arable land, ocean acidification degrades the surrounding reefs and their	Behavioural change is a key measure of the Programme's success: implementing agencies will need the active engagement of communities in making technical information useful to them so that they:	Outer island communities are aware that forecasting capability is improved by local observations and have requested weather stations for Pa Enea.

	<p>increase their resilience to climate change impacts.</p>	<p>productive ecosystems, average temperatures are rising, and rainfall patterns are more erratic.</p> <p>Communities are also at severe and frequent risk from extreme events, particularly the effects of cyclones, heavy rain and storm surge. The risk is greatly exacerbated for outer islands by communication difficulties, lack of local data and the high cost and slowness of transport options—both warnings and responses are often delayed.</p>	<ul style="list-style-type: none"> • Prepare effectively for forecast extreme events; • Manage water resources in accordance with advice on probable rainfall; and • Plan planting schedules and crop varieties on the basis of rainfall advice. <p>CIMS will seek the input of island communities to refining the outlook for their island, with practical advice for subsistence gardeners and fishers.</p> <p>Communities will be engaged in confirming, revising or developing disaster preparation and response plans.</p>	<p>Advice will be delivered in CI Maori.</p> <p>Community representatives will attend the annual National Climate Outlook Forum in Funafuti each November and share advice and recommendations on their return home.</p> <p>CIMS officers will explain the current rainfall outlook and reinforce advice from the Outlook Forum.</p> <p>CIMS will explain the use of the outlook in informing subsistence growers' decision making (with input from the agriculture ministry).</p> <p>If high temperatures are predicted, the outlook may include advice on temporary prohibitions on collecting resources from coral reefs, advice on ciguatera indicators, etc.</p> <p>The benefits of science-informed behaviour change will be communicated widely through Programme reporting.</p>
NGOs, civil society, church groups, island disaster committees, Au Vaine	Civil society organisations will benefit from opportunities to expand work they already do with communities and to extend the range of their	Church groups are very influential and will be invited to participate in the ongoing development of the National Framework for Climate Information	Civil society representatives will be members of the National Coordination Team (NCT) that will coordinate community consultation meetings and the implementation of the CB-EWS and DRR plans.	Civil society organisations will lead awareness raising campaigns with the support of the Programme; receive training in professional standard community consultation techniques to ensure

Kumiti (Women's Committee)	<p>activities, building on lessons learnt from pilot projects.</p> <p>The Programme's gender focus will expand opportunities for women to influence communications and to use information products.</p>	<p>Services in the third year of the Programme, and in the design of community activities.</p> <p>Au Vaine Kumiti is an established indigenous civil society organisation working with island communities on disaster risk management and climate change activities.</p>	<p>Au Vaine raises funds, takes Tropical Cyclone warning information to communities and shows them how to access specific information and updates from CIMS's Facebook page, teaches grandchildren to help their grandparents with technology, trains young women in IT. The Programme will enable Au Vaine to expand to Pa Enea.</p> <p>The Programme will draw on its expertise in effective communication with communities.</p>	women, youngsters, people with disabilities are able to participate fully in consultation; advise Programme implementing agencies on effective communication with their communities.
Stakeholder	Interest in the Programme	Influence on the Programme	Proposed role in the Programme	Engagement strategy
<p>Cook Islands Meteorological Service</p> <p>Mr Arona Ngari, Director, CIMS</p> <p>Mr Bates Manea, CIMS</p>	<p>CIMS is one of the two principal implementing agencies for the Programme with CCCI.</p> <p>CIMS will benefit from the expansion of its data observation network and from Programme support in extending the range of tailored advice it can offer to clients.</p>	<p>CIMS's active engagement will be essential to the success of the Programme.</p> <p>CIMS is committed to using the Programme to strengthen its provision of information services so that climate information is mainstreamed into the work of government agencies and into science-informed adaptation by communities.</p>	<p>The Programme will enable CIMS to modernise its equipment and extend its observation network to the outer islands and territorial waters, improving the accuracy of its climate forecasting.</p> <p>Additional officers for climate and ocean information services will enable CIMS to expand their range of services and to generate tailored products for key sectors.</p> <p>Modern communication equipment will enable CIMS to provide much more reliable information, warnings and advice to remote communities and to receive data from all islands.</p> <p>CIMS will be responsible for the maintenance of additional equipment, with the support of regional partners.</p>	<p>Ongoing capacity development and support from the Programme and from regional partners will raise CIMS's profile nationally, make the work of its staff more interesting, enable staff to see positive impacts from their work and enable them to influence government policy on a critical development issue.</p> <p>The Programme will enable staff to undertake hands-on work with all communities including outer islands in areas CIMS has identified as very high priorities in successive planning documents.</p>

Climate Change Cook Islands (CCCI) Mr Wayne King, Director CCCI and NDA for interaction with the GCF	CCCI is one of the two principal implementing agencies for the Programme with CIMS. Its Director is the NDA for the GCF and manager of the GCF CI Country Programme. CCCI will contract CIMS to implement parts of this Programme.	CCCI is committed to ensuring the success of the GCF CI Country Programme and has been engaged in the design of this Programme since its inception. CI activities will complement the GCF Country Programme.	CCCI will manage the sail drone activity which will gather ocean data relevant to climate and weather forecasting, long term climate observation, bathymetry, fisheries and transport. It will manage the University of Waikato's assessment of the vulnerability of assets and infrastructure to climate impacts. The Programme team will be located in CCCI, in the Prime Minister's Department.	CCCI will be an integral part of the Programme's implementation and is already actively engaged with other stakeholders in related activities.
Emergency Management Cook Islands (EMCI)	EMCI is a key agency in any activity reducing climate change risks and impacts and its staff will be important partners in the Programme.	EMCI's engagement will be essential to the success of the National Framework for Climate Services.	EMCI will partner with CIMS in activities relating to disaster preparation, warning, management and response. Structured, funded and supported collaboration between the two agencies will strengthen both, and improve the usefulness of advice that they provide to communities.	EMCI will benefit from training on effective community consultation. Staff will be invited to accompany CIMS staff on visits to outer islands particularly when disaster awareness materials are being co-designed with communities, the climate outlook is being explained, drought indicators are being worked out, communication methods trialled, and any other activities where EMCI's input will be valuable.
National Environment Service Ministry (MoE)	MoE is SPREP's primary partner in the Inform project which is locating, retrieving and storing national environmental data, information and key documents in a national portal for the Cook Islands Government.	This Programme will fund a National Coordinator (NC) for the Inform project, who will work within MoE as an adviser to other ministries to help them make use of scientific and other data in their own work.	This Programme will enable the Inform project to add climate data to CIG's national portal and to ensure climate information is used wherever needed in the policy and planning work of other ministries and departments. The NC will be a member of the technical committee that drafts the National Data and Information Strategic Action Plan which will include climate data and information. Implementation of the plan will entail	The NC's work will be highly interactive across related CIG agencies responsible for environmental management, DRR, public media and with CIMS. Mainstreaming climate information into sectors is a key component of the Programme and the NC will be supported by the national manager and regional partners.

			mainstreaming the use of climate information into the work of sector ministries.	
CITV Radio Cook Islands	<p>Public Media is a key agent in EWS and in communicating routine climate information. In CI this includes CITV, radio and newspapers.</p> <p>Media sources' advice to the Programme on how to make technical information more understandable will be critical to ensuring steady improvement of the presentation and delivery of information in accessible formats through public media.</p>	Media organisations will be important contributors to the National Framework for Climate Services (NFCS) facilitated workshop in the first year of the Programme.	<p>One function of the NFCS will be to agree on protocols for communication of warnings and advice before and during extreme events.</p> <p>The national Programme Manager will monitor the progress of this collaboration to ensure agreed systems are fit for purpose.</p> <p>Throughout the term of the Programme, implementing agencies will work to improve the accessibility of climate and weather information.</p>	<p>The Programme will provide climate information materials such as videos explaining climate processes (Climate Crab, etc) developed by regional partners.</p> <p>New resource materials for radio and television developed by SPREP, SPC, CSIRO and the other Programme countries will be shared.</p> <p>The Programme will source climate-related materials and help to arrange translation into CI Maori.</p> <p>It will fund graphical software that will enable visualisation of weather and climate events on the website and on CITV.</p>
Ministry of Agriculture / Brian Tairea, Senior Extension/ Advisory Officer, MoA	MoA will be an important partner in work with communities on applying climate information to farming.	<p>MoA will be invited to contribute to the National Framework for Climate Services facilitated workshop in the first year of the Programme.</p> <p>Its advice to the Programme on useful information products will be an essential step in helping farmers and gardeners to use climate advice and adapt their practices to conditions.</p>	MoA will work with CIMS's climate officer to adapt climate information such as seasonal rainfall predictions to the needs of subsistence growers and the growing commercial organic agriculture sector.	Encouraging farmers and gardeners to adapt their practices to actual conditions is a long-term undertaking and the more often MoA staff can discuss the benefits of adaptation on-site, the more likely behaviour is to change. Regular visits will support subsistence growers in trying crop selection to match expected rainfall through the growing season, for instance.

Health Ministry	Seasonal forecast information and information on predictable long term changes have potential to help the Ministry of Health to manage disease risks and climate related ill-health more effectively. Early prediction of drought can reduce the impacts of severe shortages of water for drinking and washing. It may be possible to forecast the risk of dengue and other vector-borne disease outbreaks.	MoH will be invited to contribute to the initial draft of the National Framework for Climate Services, in a facilitated workshop in the first year of the Programme. MoH staff will be asked to explain what kinds of information would be useful to them to reduce avoidable ill-health, disease outbreaks and injuries from extreme events.	MoH's main role in the Programme will be as users of information. Its staff will be regularly consulted about the continuing usefulness of information products.	MoH officers may be invited to accompany TMS on visits to outer islands to explain the implications of seasonal forecasts for community health.
Stakeholder	Interest in the Programme	Influence on the Programme	Proposed role in the Programme	Engagement strategy
Pacific Regional Environment Programme (SPREP)	The Manager of the Programme's multi-country hub will be located on the SPREP campus, but independent of SPREP. SPREP hosts the Pacific Meteorological Council and the Pacific Climate Change Centre and is an important source of support to Pacific Meteorological Services who are principal partners in the Programme. WMO's Pacific representative is also located in Apia, Samoa.	SPREP has particular strengths and experience in community engagement and in technical support. SPREP's PacMetDesk manages a monthly teleconference with Pacific NMSs including Cook Islands, in which CIMS checks its current seasonal forecast, generated from local data using SCOPIC. The seasonal forecast is the foundation for CIMS's advice on probable rainfall for the 3 to 9 months ahead. SPREP's support is essential to CIMS's provision of the advice of	SPREP will continue its ongoing support to CIMS, contributing to a support base shared among all Pacific NMSs. This includes: <ul style="list-style-type: none"> • Providing the annual Regional Climate Outlook Forum before each cyclone season (Oct/Nov) and helping NMSs prepare their National Climate Outlook Forum; • Maintaining CliDE—through the Programme, SPREP will help CIMS develop a key entry form so that MoH, Fisheries and DoA can enter and store their data in CliDE, for use in conjunction with climate data; • Maintaining SCOPIC to ensure CIMS's seasonal forecasts are accurate; 	The Programme will enable SPREP to build on existing work with CIMS in areas identified as high priorities by both organisations. SPREP is a longstanding partner with Pacific NMSs with broad experience in technical support, ecosystem management and working with communities. SPREP will be closely engaged throughout the term of the Programme, as it provides capacity development to CIMS through assistance with workshops, provision of training and development of new tools.

	<p>Many of SPREP's own activities will complement the Programme and the Programme will build on successful past pilot projects.</p> <p>SPREP's Inform Project will contribute to CIMS's strengthened data management.</p>	<p>most interest to Cook Islands farmers, water managers, disaster managers and health authorities.</p> <p>SPREP maintains the code of the climate data management system (CliDE) used by all Pacific NMSs.</p>	<ul style="list-style-type: none"> Continuing the Online Climate Outlook Forum to maintain CIMS's Climate Officer's confidence in generating and explaining the monthly seasonal forecasts; Developing new data products using CIMS's CliDE data; Providing lessons from previous community awareness projects and practical adaptation projects in the Cook Islands and with other atoll countries; Developing training modules in meteorology and climatology for CIMS staff; Sourcing specialised advice within SPREP's other divisions to support the Programme's work with sector clients; and Hosting the Cook Islands' climate data in its Inform database. <p>SPREP will lead a workshop in the Cook Islands to develop community-based response plans for extreme weather / climate events. This will include a strong gender focus.</p>	
The Pacific Community (SPC)	<p>SPC will make a major contribution to the addition of oceanographic services to CIMS's capabilities. The extension of observation capacity to the Cook Islands' ocean areas will also benefit SPC's climate</p>	<p>SPC will contribute procurement expertise to the Programme ensuring purchases of modern observing equipment represent value for money and will assist CIMS with training in use and</p>	<p>SPC will continue its ongoing support to CIMS, contributing to a support base shared among all Pacific NMSs. This includes:</p> <ul style="list-style-type: none"> Providing regional oceanographic services, and extending and down-scaling the services through the Programme; and 	<p>Training and attachments for CIMS's staff and especially the new climate services and ocean services officers will ensure collaboration and identification of synergies.</p>

	monitoring and analysis capacity.	<p>maintenance, with ongoing technical support.</p> <p>SPC will ensure that its related work complements Programme activities.</p>	<ul style="list-style-type: none"> Supporting CIMS as it begins to build capacity in ocean information services, through training and attachments. <p>SPC maintains and provides access to the Pacific Ocean Portal originally developed by BoM through COSPPac - the Portal allows a user with limited internet access to select a location and a sector such as tourism, fisheries, and shipping, ask for ocean parameters such as sea temperature, wave heights, coral bleaching, currents, salinity and chlorophyll, and receive the information visualised as maps and diagrams.</p>	
Australian Bureau of Meteorology (BoM)	<p>BoM is a long-term partner of Pacific meteorological services, in accordance with its responsibility as a developed country member of WMO.</p> <p>Australia has supported essential meteorological services in Pacific countries for many decades and more recently has contributed systematic support for NMSs as they have built capacity in the provision of local climate services.</p>	<p>BoM continues to deliver the Climate and Oceans Support Program in the Pacific (COSPPac), supporting the achievement of NMS's priorities for delivery of reliable and accessible climate information services.</p> <p>The Programme will coordinate regularly with BoM to ensure the coordination of activities.</p>	<p>The Cook Islands' new climate services and ocean services officers will undertake training and attachments at BoM over the life of the Programme.</p> <p>BoM will deliver training in the Cook Islands on seasonal prediction using ACCESS-S software and on the use of information in preparing for the tropical cyclone season and for climate extremes such as droughts and floods. CIMS staff will learn the use of ACCESS-S for seasonal forecasting for ocean conditions.</p> <p>BoM will help CIMS staff on attachment to prepare scientific material for publication and provide opportunities for them to present papers and posters at climate conferences.</p> <p>BoM will conduct workshops in partnership with CIMS to build the scientific understanding of staff and their capacity to explain to their clients the application of</p>	<p>BoM is an implementing partner engaged in related activities with the Cook Islands in which CIMS is the primary stakeholder.</p> <p>Australia is committed to assisting Pacific countries to adapt to climate change.</p>

			<p>climate monitoring and prediction products to their sectors.</p> <p>As an addition to the long-running Sea Level Monitoring Project (1991—) BoM will install and manage a temporary tide gauge at Pukapuka in the northern Cooks group of islands. Pukapuka's tides are significantly distant from those at the permanent tide gauge at Rarotonga and the additional data will be passed to SPC for development of a local tide calendar.</p>	
Stakeholder	Interest in the Programme	Influence on the Programme	Proposed role in the Programme	Engagement strategy
New Zealand National Institute for Water and Atmospheric Research (NIWA)	NIWA has a long relationship with Pacific NMSs and particularly the Polynesian countries such as the Cook Islands. New Zealand funded the maintenance of essential observing equipment in neighbouring countries for many years and has expertise in providing and maintaining robust equipment suitable for tropical environments and limited local technical capacity.	NIWA has developed a range of tools for use in Pacific countries using CliDE data—the CliDE Client Services suite, or CliDEsc.	<p>NIWA will contribute to training and technical support for installation, calibration and site inspections for new observation and monitoring equipment.</p> <p>Training will be delivered in the Cook Islands and at the NIWA Instrument Laboratory.</p>	New Zealand is committed to assisting Pacific countries to adapt to climate change.
Cook Islands' private sector	The Cook Islands' private sector is concentrated in agriculture, fishing, tourism and pearl farming—these are all very climate sensitive industries and will benefit from well-communicated advice on how to use	The private sector will be invited to contribute to the reiterative development of the National Framework for Climate Services in the second year of the Programme.	<p>The private sector's principal role will be as a consumer of information services and representatives will be asked to work with the Programme and TMS to establish their information needs.</p> <p>The Cook Islands agriculture and mariculture departments have extension officers who will be engaged in the</p>	The Programme will publicise the benefits of using climate information to minimise the destructive impacts of climate change and extreme weather events on businesses.

	climate and weather information.	CIMS will work with businesses to identify tailored climate information services that will build capacity to adapt to climate change and enable businesses to minimise the loss of assets to extreme climate events.	Programme, and other supportive organisations like the Pa Enua Action for Resilient Livelihoods (PEARL) project. Gardeners, farmers and pearl farmers are accustomed to working with technical experts and are likely to be readily engaged in a process of improving climate advice.	
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Niue

The consultants visited Niue from 1-5 April 2019 and held meetings with the Niue Meteorology Service (NMS) and their key national stakeholders (refer to Table 1). Stakeholders were invited to share their knowledge and ideas and provide detailed input on potential interventions and activities for Niue within the Concept Note components. The report summarises the priority issues arising from the face-to-face meetings with each sector stakeholder.

The consultants met 19 representatives of multiple departments within Niue Ministries and Departments: the Ministry of Infrastructure, Ministry of Natural Resources, Ministry of Social Services, Department of Utilities, Department of Agriculture, Forestry and Fisheries, Department of Environment, Department of Education, Department of Health, Department of Tāoga Niue, Project Management and Coordination Unit, Green Climate Readiness Program, Niue High School, Niue Early Childhood Education and Niue Meteorological Services.

Table 7 shows the Stakeholder Engagement Schedule proposed by the Niue Meteorology Services, **Table 8** lists the Representatives met and **Table 9** is the Stakeholder Table.

Table 4: Niue Stakeholder Engagement Schedule

Dates	Stakeholders
Monday, 1 April, 2019	<p>11.30 am: Arrival of PSS team in Niue</p> <p>2.00 pm: Briefing meeting with Director, Niue Meteorological Services, NDA, Project Management and Coordination Unit, Office of the Premiere and Green Climate Readiness Programme</p>
Tuesday, April 2, 2019	<p>9.00 am: General meeting:</p> <ul style="list-style-type: none"> • Ministry of Natural Resources; • Department of Education - Ministry of Social Services; • Department of Environment; • Department of Agriculture, Forestry and Fisheries; • Department of Health; • Meteorological Services; • Department of Tāoga Niue; • Niue High School; and • Niue Early Childhood Education. <p>1.30 pm: Ministry of Natural Resources</p>
Wednesday, April 3, 2019	<p>9.00 am: Department of Agriculture, Forestry and Fisheries</p>

	11.00 am: Department of Education 1.00 pm: Niue Meteorological Service
Thursday, April 4, 2019	2.00 pm: NDA, Project Management and Coordination Unit, Office of the Premiere; and Green Climate Readiness Program
Friday, April 5, 2019	Departure of PSS from Niue

Table 5: Participants at Niue Country Engagement

	Participant	Position
1	Rosslyn Mitiepo	Director, Meteorological Services
2	Dr. Josie Tamate	Director General, Ministry of Natural Resources
3	Andre Siohane	Director General, Ministry of Infrastructure
4	Birtha Tongahai	Acting Director General, Ministry of Social Services and Director, Department of Education
5	Poi Okesene	Director, Department of Agriculture, Forestry and Fisheries
6	Maira Enetama	Director, Department of Tāoga Niue
7	Haden Talagi	Director, Department of Environment
8	Natasha Tohovaka	Deputy Director, Department of Agriculture, Forestry and Fisheries
9	Felicia Pihigia	Project Management and Coordination Unit/National Designated Authority, Office of the Premier
10	Ann-Marie Aholima	Project Manager, Green Climate Readiness Program
11	Charles Ioane	Principal, Niue High School
12	O'love Hekesi	Principal, Niue Early Childhood Education
13	Hingano Laufoli Hipa	Meteorology Officer
14	Lenita Togiamana	Meteorology Trainee
15	Charlotte Pihigia	Climate Change Officer
16	Itzy Tukuitoga	Administration Officer, Department of Education
17	Colleen Kulatea	Department of Health

18	Raquel Tanaki New	Climate Trainee
19	Sioneheke Leolahi	Niue Island (Umbrella) Association of NGOs (NIUANGO)

The PSS team started their in-country consultations with a briefing meeting with Rossylyn Mitiepo, Director of the Niue Meteorological Services, Felicia Pihigia of the Project Management and Coordination Unit of the Office of the Premier and who is also the National Designated Authority for the GCF, and Anne-Marie Aholima of the Green Climate Readiness Programme. This was followed by a general briefing meeting with the representatives from key sectors (proposed by the NDA) which led to individual meetings with representatives and heads of departments of the invited sectors. The consultants introduced the proposed Programme components, background and objectives of the in-country stakeholder consultation. Sector representatives were asked to share their input on departmental and sector barriers to accessing and using climate services. Each meeting included in-depth discussion on departmental functions and the climate and ocean related sector-specific products and services it required.

Each ministry / department meeting included in-depth discussions on:

- the Department's required climate and ocean related sector-specific products and services;
- Potential interventions and tools that build on past and current development initiatives to enhance sustainability; and
- National institutional arrangements that would strengthen access, delivery and use of climate and ocean information and knowledge services for key stakeholders, agencies and communities in Niue.

Summary of key discussion issues

Dissemination of climate information between the Niue Meteorological Service and key stakeholder agencies—Health, Education, Agriculture, Fisheries.

- Need to develop agency and sector-specific products and services and conduct sector workshops for Global Framework for Climate Services (GFCS) sector agencies, to develop an information and communication plan and specialised climate bulletins;
- Need to communicate climate forecasts to sectors, facilitate access, and train sector agencies to understand the climate information;
- Establish annual National Climate Outlook Forum or workshop led by the NMS;
- Need to develop national framework providing strategic and operational guidance for coordination amongst key stakeholders of climate services;
- Need to support student holiday programme in climate and ocean services;
- More annual school visits by NMS;
- Need for national data hub;

- Need for a new group/Technical Committee to develop MNR Data Strategy, action plan, national workshops and convene quarterly meetings. Dissemination of Climate Information between NMS and the community;
- Need for more community outreach programmes by the NMS including hands-on training at manual climate stations;
- Need for more visual awareness products to aid understanding as many Niueans do not speak English;
- Need for localised climate and weather information – terminologies should be basic, translated, relevant and presented in a form that is useful to local community e.g. farmers and fishermen;
- Ensure local commitment for proposed interventions;
- Need for monitoring of traditional knowledge indicators, and referencing as baseline knowledge;
- Need for community training on climate change and oceans information;
- Need for more NMS support;
- Need to increase frequency of climate and weather forecasts over the radio;
- Need to support ocean science attachment training, and national climate training;
- Need to support monthly climate forecast with Niue Star;
- Need for new UPS at Niue Met Service;
- Need Climate TV awareness programme; and
- Need to support Broadcasting Commission Niue (BCN).

Table 6: Niue Stakeholder Table

Stakeholder	Interest in the Programme	Influence on the Programme	Proposed role in the Programme	Engagement strategy
Felicia Pihigia, Project Management and Coordination Unit/National Designated Authority, Office of the Premier	<p>The Project Management Coordinating Unit (PMCU) in the Premier's Office and Ministry of Finance manages all externally funded activities.</p> <p>The Green Climate Fund Readiness Project and the National Designated Authority for Interaction with</p>	<p>The PMCU is responsible for the overall coordination and capacity building of Niue's engagement with the Green Climate Fund and it will be the Executing Entity for Niue.</p> <p>A key priority of the NDA is to develop a strategic approach to pipeline</p>	All development activities are oversighted by the Project Oversight Steering Committee (POST), also in the Premier's Office. Its key role is to provide governance and oversight of all government projects.	<p>All three agencies will be involved regularly in the Programme through formal meetings.</p> <p>Their oversight functions will contribute to good coordination with related activities in Niue.</p>

Anne-Marie Aholima, Project Manager, Green Climate Readiness Programme	the GCF are both located in the PMCU.	development and harmonisation of resources with the broader development of Niue's climate agenda.		
Niue Meteorological Service Ms Rossylyn Mitiepo, Director NMS	NMS is the principal implementing agency for the Programme. NMS will benefit from the expansion of its data observation network and from Programme support in extending the range of tailored advice it can offer to clients.	NMS's active engagement will be essential to the success of the Programme. NMS is committed to using the Programme to strengthen its provision of information services so that climate information is mainstreamed into the work of government agencies and into science-informed adaptation by communities.	The Programme will enable NMS to modernise its equipment and extend its observation network to its territorial waters, improving the accuracy of its climate forecasting. Additional officers for climate and ocean information services will enable NMS to expand its range of services and to generate tailored products for key sectors. Modern communication equipment will enable NMS to provide much more reliable information, warnings and advice to remote communities and to receive data from all islands. NMS will be responsible for the maintenance of additional equipment, with the support of regional partners.	Ongoing capacity development and support from the Programme and from regional partners will raise NMS's profile nationally, make the work of its staff more interesting, enable staff to see positive impacts from their work and enable them to influence government policy on a critical development issue. The Programme will enable staff to undertake hands-on work with all communities in areas NMS has identified as very high priorities in successive planning documents.
All Ministries and Government Departments	The Government of Niue is a primary beneficiary of all Programme interventions: one of the Programme's objectives is to facilitate the flow of climate information that government agencies will use to increase Niue's resilience to climate change impacts.	The support of senior ministry officials will be essential to the success of the National Framework for Climate Services. They must be able to see tangible benefits for their departments from mainstreaming climate information into their	The active engagement of government staff will be critical to the following activities: <ul style="list-style-type: none"> Working with the national Programme Manager, NMS and consultants to understand how climate considerations can be mainstreamed into the work of their agencies; Using good quality science and evidence-based information on long-term climate change in planning infrastructure and 	Engagement ensured through: <ul style="list-style-type: none"> Workshopping the design of the National Framework for Climate Services with NMS and a facilitator; Technical support and staff training provided to sector focal representatives on climate science, community consultation techniques, etc;

		<p>policies and planning functions.</p> <p>The support of all ministry staff will be essential to the implementation of the NFCS. The mainstreaming of climate information into their work must address their own priorities for improving their services to communities.</p>	<p>other development investments and avoiding maladaptation;</p> <ul style="list-style-type: none"> • Identifying a suite of directly applicable information products relevant to their work; • Participating in a consultative workshop to develop and refine a National Framework for Climate Services; • Agreeing a process for checking the utility of information products regularly and revising them when needed; and • Proactively raising obstacles to mainstreaming with the Programme team throughout the term of the Programme. 	<ul style="list-style-type: none"> • Support for delivering targeted face-to-face advice to village communities on the implications of climate change in their sector. • NMS visits to schools; • Dedicated Inform officer who will help government agencies to find, store and use climate and environmental data and information in the work of their agencies.
Village communities	<p>Communities are one of the ultimate beneficiaries of all Programme interventions: the Programme's objective is to facilitate the flow of climate information that communities will use to increase their resilience to climate change impacts.</p>	<p>All Niue's communities are affected by long term climate change impacts—sea level rise causes erosion, ocean acidification degrades the surrounding reef and its productive ecosystems, average temperatures are rising and rainfall patterns are more erratic.</p> <p>Communities are also at severe and frequent risk from extreme events, particularly the effects of cyclones, heavy rain and drought.</p>	<p>Behaviour change is a key measure of the Programme's success: implementing agencies will need the active engagement of communities in making technical information useful to them so that they:</p> <ul style="list-style-type: none"> • Prepare effectively for forecast extreme events; • Manage water resources in accordance with advice on probable rainfall; and • Plan planting schedules and crop varieties on the basis of rainfall advice. <p>NMS will seek the input of village communities to refining the outlook for their environment, with practical advice for subsistence gardeners and fishers.</p> <p>Communities will be engaged in confirming, revising or developing disaster preparation and response plans.</p>	<p>Advice will be delivered in Niuean.</p> <p>Community representatives will attend the annual National Climate Outlook Forum in Alofi each November and share advice and recommendations with their communities.</p> <p>NMS officers will explain the current rainfall outlook and reinforce advice from the Outlook Forum.</p> <p>NMS will explain the use of the outlook in informing subsistence growers' decision making (with input from the agriculture ministry).</p> <p>If high temperatures are predicted, the outlook may include advice on temporary</p>

				<p>prohibitions on collecting resources from coral reefs, advice on ciguatera indicators, etc.</p> <p>The benefits of science-informed behaviour change will be communicated widely through Programme reporting.</p>
NGOs, civil society, church groups, village disaster committees, Boys' and Girls' Brigades	<p>Civil society organisations will benefit from opportunities to expand work they already do with communities and to extend the range of their activities, building on lessons learnt from pilot projects.</p> <p>The Programme's gender focus will expand opportunities for women to influence communications and to use information products.</p>	Civil society groups are very influential and will be invited to participate in the ongoing development of the National Framework for Climate Information Services in the third year of the Programme, and in the design of community activities.	Civil society representatives, especially those engaged in related projects, will be invited to take part in Programme activities, strengthening the impact of all inputs. Programme implementers will draw on the expertise of NGOs and village committees.	Civil society organisations will lead awareness raising campaigns with the support of the Programme; receive training in professional standard community consultation techniques to ensure women, youngsters, people with disabilities are able to participate fully in consultation; advise Programme implementing agencies on effective communication with their communities.
National Disaster Council (NDC)	NDC is a key agency in any activity reducing climate change risks and impacts and its staff will be important partners in the Programme.	NDC's engagement will be essential to the success of the National Framework for Climate Services.	<p>NDC will partner with NMS in activities relating to disaster preparation, warning, management and response.</p> <p>An NMS officer is currently working with NDC and the Police to improve understanding of climate and weather information and to foster coordination among agencies, particularly during extreme events.</p> <p>Structured, funded and supported collaboration between the two agencies will</p>	NDC will benefit from training on effective community consultation. Staff will be invited to accompany NMS staff on visits to villages particularly when disaster awareness materials are being co-designed with communities, the climate outlook is being explained, drought indicators are being worked out,

			strengthen both, and improve the usefulness of advice they provide to communities.	communication methods trialled, and any other activities where NDC's input will be valuable.
Stakeholder	Interest in the Programme	Influence on the Programme	Proposed role in the Programme	Engagement strategy
Ministry of Natural Resources Dr Josie Tamate, Director General, MNR	MNR is SPREP's primary partner in the Inform project which is locating, retrieving and storing national environmental data, information and key documents in a national portal for the Government of Niue.	This Programme will fund a National Coordinator (NC) for the Inform project, who will work within MNR as an adviser to other ministries to help them make use of scientific and other data in their own work.	This Programme will enable the Inform project to add climate data to Niue's national Portal and to ensure climate information is used wherever needed in the policy and planning work of other ministries and departments. The NC will be a member of the technical committee that drafts the National Framework for Climate Services. Implementation of the plan will entail mainstreaming the use of climate information into the work of sector ministries.	The NC's work will be highly interactive across related agencies responsible for environmental management, DRR, public media and with NMS. Mainstreaming climate information into sectors is a key component of the Programme and the NC will be supported by the national manager and regional partners.
Broadcasting Corporation of Niue (BCN)	Public Media is a key agent in EWS and in communicating routine climate information. In Niue the BCN broadcasts radio and television. Media sources' advice to the Programme on how to make technical information more understandable will be critical to ensuring steady improvement of the presentation and delivery of information in accessible formats through public media.	BCN will be an important contributor to the National Framework for Climate Services (NFCS) facilitated workshop in the first year of the program.	One function of the NFCS will be to agree on protocols for communication of warnings and advice before and during extreme events. The national Programme Manager will monitor the progress of this collaboration to ensure agreed systems are fit for purpose. Throughout the term of the Programme, implementing agencies will work to improve the accessibility of climate and weather information. This will include development and use of Niuean terms for climate and weather phenomena, and greater use of visual materials for TV.	The Programme will provide climate information materials such as videos explaining climate processes (Climate Crab etc) developed by regional partners. New resource materials for radio and television developed by SPREP, SPC, CSIRO and the other Programme countries will be shared. The Programme will source climate related materials and help to arrange translation into Niuean.

<p>Department of Agriculture, Forestry and Fisheries</p> <p>Natasha Tohovaka Deputy Director, DAFF</p>	<p>DAFF will be an important partner in work with communities on applying climate information to farming, gardening and fishing.</p>	<p>DAFF will be invited to contribute to the National Framework for Climate Services facilitated workshop in the first year of the Programme. Its advice to the Programme on useful information products will be an essential step in helping farmers and gardeners to use climate advice and adapt their practices to conditions.</p>	<p>DAFF will work with NMS's climate officer to adapt climate information such as seasonal rainfall predictions to the needs of subsistence growers and artisanal fishers.</p> <p>Climate information is essential to sustainable management of Niue reef system.</p>	<p>Encouraging farmers and gardeners to adapt their practices to actual conditions is a long-term undertaking and the more often DAFF staff can discuss the benefits of adaptation on-site, the more likely behaviour is to change. Regular visits will support subsistence growers in trying crop selection to match expected rainfall through the growing season, for instance.</p>
<p>Department of Health, Colleen Kulatea</p>	<p>Seasonal forecast information and information on predictable long term changes have potential to help the DoH to manage disease risks and climate related ill-health more effectively. Early prediction of drought can reduce the impacts of severe shortages of water for drinking and washing. It may be possible to forecast the risk of dengue and other vector-borne disease outbreaks.</p>	<p>DoH will be invited to contribute to the initial draft of the National Framework for Climate Services, in a facilitated workshop in the first year of the Programme.</p> <p>DoH staff will be asked to explain what kinds of information would be useful to them to reduce avoidable ill-health, disease outbreaks and injuries from extreme events.</p>	<p>DoH's main role in the Programme will be as users of information. Its staff will be regularly consulted about the continuing usefulness of information products.</p>	<p>DoH officers may be invited to accompany TMS on visits to villages to explain the implications of seasonal forecasts for community health.</p>
<p>Department of Tāoga Niue</p> <p>Moirā Enetama, Director, DoTN</p>	<p>NMS has a well-advanced activity recording traditional climate knowledge, which is an important aspect of Niue's Tāoga.</p>	<p>DoTN will be invited to contribute to the initial draft of the National Framework for Climate Services, in a facilitated workshop in the first year of the Programme.</p>	<p>DoTN will advise on management of the purpose-built database of traditional climate knowledge, which will have culturally determined levels of access to information by different users.</p>	<p>DoTN may also take part in the ongoing collection of climate knowledge with village elders.</p>

Charles Ioane, Principal, Niue High School O'love Hekesi, Principal, Niue Early Childhood Education Itzy Tukuitoga, Department of Education	The Department of Education and the Principals of the primary and secondary schools are integrating climate information into curriculums.	Schools use a geography curriculum based on New Zealand's which include climate education. NMS visits schools and recruits high school students as meteorology and climatology trainees every year.	The Programme will enable greater interaction with schools by providing NMS with additional staff, who will be trained in effective communication of climate science.	The two schools ask for regular visits from NMS staff and the Programme will make these visits more frequent and more informative, with engaging materials developed by various Programme partners, including NMS.
Stakeholder	Interest in the Programme	Influence on the Programme	Proposed role in the Programme	Engagement strategy
Pacific Regional Environment Programme (SPREP)	<p>The Manager of the Program's multi-country hub will be located on the SPREP campus, but independent of SPREP. SPREP hosts the Pacific Meteorological Council and the Pacific Climate Change Centre and is an important source of support to Pacific Meteorological Services who are principal partners in the Programme. WMO's Pacific representative is also located in Apia, Samoa.</p> <p>Many of SPREP's own activities will complement the Programme and the Programme will build on successful past pilot projects.</p> <p>SPREP's Inform Project will contribute to NMS's</p>	<p>SPREP has particular strengths and experience in community engagement and in technical support.</p> <p>SPREP's PacMetDesk manages a monthly teleconference with Pacific NMSs including Niue, in which NMS checks its current seasonal forecast, generated from local data using SCOPIC.</p> <p>The seasonal forecast is the foundation for NMS's advice on probable rainfall for the 3 to 9 months ahead. SPREP's support is essential to NMS's provision of the advice of most interest to Niue's farmers, water managers, disaster managers and health authorities.</p>	<p>SPREP will continue its ongoing support to CIMS, contributing to a support base shared among all Pacific NMSs. This includes:</p> <ul style="list-style-type: none"> • Providing the annual Regional Climate Outlook Forum before each cyclone season (Oct/Nov) and helping NMSs prepare their National Climate Outlook Forum; • Maintaining CliDE, the climate data management system used by NMSs to record, store and retrieve climate data; • Maintaining SCOPIC to ensure NMS's seasonal forecasts are accurate; • Continuing the Online Climate Outlook Forum to maintain NMS's Climate Officer's confidence in generating and explaining the monthly seasonal forecasts; • Developing new data products using NMS's CliDE data; • Providing lessons from previous community awareness projects and 	<p>The Programme will enable SPREP to build on existing work with NMS in areas identified as high priorities by both organisations.</p> <p>SPREP is a longstanding partner with Pacific NMSs with broad experience in technical support, ecosystem management and working with communities.</p> <p>SPREP will be closely engaged throughout the term of the Programme, as it provides capacity development to NMS through assistance with workshops, provision of training and development of new tools.</p>

	strengthened data management.	SPREP maintains the code of the climate data management system (CliDE) used by all Pacific NMSs.	<p>practical adaptation projects in Niue and with other atoll countries;</p> <ul style="list-style-type: none"> • Developing training modules in meteorology and climatology for NMS staff; • Sourcing specialised advice within SPREP's other divisions to support the Programme's work with sector clients; and • Hosting Niue's climate data in its Inform database. <p>SPREP will lead a workshop in Niue to develop community-based response plans for extreme weather / climate events. This will include a strong gender focus.</p>	
The Pacific Community (SPC)	SPC will make a major contribution to the addition of oceanographic services to NMS's capabilities. The extension of observation capacity to Niue's ocean areas will also benefit SPC's climate monitoring and analysis capacity.	<p>SPC will contribute procurement expertise to the Programme ensuring purchases of modern observing equipment represent value for money and will assist NMS with training in use and maintenance, with ongoing technical support.</p> <p>SPC will ensure that its related work complements Programme activities.</p>	<p>SPC will continue its ongoing support to NMS, contributing to a support base shared among all Pacific NMSs. This includes:</p> <ul style="list-style-type: none"> • Providing regional oceanographic services, and extending and down-scaling the services through the Programme; and • Supporting NMS as it begins to build capacity in ocean information services, through training and attachments. <p>SPC maintains and provides access to the Pacific Ocean Portal originally developed by BoM through COSPPac: the Portal allows a user with limited internet access to select a location and a sector such as tourism, fisheries, and shipping, ask for ocean parameters such as sea temperature, wave heights, coral bleaching, currents, salinity and chlorophyll, and receive the information visualised as maps and diagrams.</p>	Training and attachments for NMS's staff and especially the new climate services and ocean services officers will ensure collaboration and identification of synergies.

<p>Australian Bureau of Meteorology (BoM)</p>	<p>BoM is a long-term partner of Pacific meteorological services, in accordance with its responsibility as a developed country member of WMO.</p> <p>Australia has supported essential meteorological services in Pacific countries for many decades and more recently has contributed systematic support for NMSs as they have built capacity in the provision of local climate services.</p>	<p>BoM continues to deliver the Climate and Oceans Support Program in the Pacific (COSPPac), supporting the achievement of NMS's priorities for delivery of reliable and accessible climate information services.</p> <p>The Programme will coordinate regularly with BoM to ensure the coordination of activities.</p>	<p>Niue's new climate services and ocean services officers will undertake training and attachments at BoM over the life of the Programme.</p> <p>BoM will deliver training in Niue on seasonal prediction using ACCESS-S software and on the use of information in preparing for the tropical cyclone season and for climate extremes such as droughts and floods. NIMS staff will learn the use of ACCESS-S for seasonal forecasting for ocean conditions.</p> <p>BoM will help NMS staff on attachment to prepare scientific material for publication and provide opportunities for them to present papers and posters at climate conferences.</p> <p>BoM will conduct workshops in partnership with NMS to build the scientific understanding of staff and their capacity to explain to their clients the application of climate monitoring and prediction products to their sectors.</p>	<p>BoM is an implementing partner engaged in related activities with Niue in which NMS is the primary stakeholder.</p> <p>Australia is committed to assisting Pacific countries to adapt to climate change.</p>
<p>New Zealand National Institute for Water and Atmospheric Research (NIWA)</p>	<p>NIWA has a long relationship with Pacific NMSs and particularly the Polynesian countries such as Niue. New Zealand funded the maintenance of essential observing equipment in neighbouring countries for many years and has expertise in providing and maintaining robust equipment suitable for tropical environments</p>	<p>NIWA has developed a range of tools for use in Pacific countries using CliDE data—the CliDE Client Services suite, or CliDEsc.</p>	<p>NIWA will contribute to training and technical support for installation, calibration and site inspections for new observation and monitoring equipment.</p> <p>Training will be delivered in Niue and at the NIWA Instrument Laboratory.</p>	<p>New Zealand is committed to assisting Pacific countries to adapt to climate change.</p>

	and limited local technical capacity.			
Niue's private sector	The Cook Islands' private sector is small and concentrated in agriculture, fishing and tourism—these are all very climate sensitive industries and will benefit from well-communicated advice on how to use climate and weather information.	<p>The private sector will be invited to contribute to the reiterative development of the National Framework for Climate Services in the second year of the Programme.</p> <p>NMS will work with businesses to identify tailored climate information services that will build capacity to adapt to climate change and enable businesses to minimise the loss of assets to extreme climate events.</p>	<p>The private sector's principal role will be as a consumer of information services and representatives will be asked to work with the Programme and TMS to establish their information needs.</p> <p>Niue's agriculture, forestry and fisheries department has extension officers who will be engaged in the Programme. Gardeners and farmers are accustomed to working with technical experts and are likely to be readily engaged in a process of improving climate advice.</p>	The Programme will publicise the benefits of using climate information to minimise the destructive impacts of climate change and extreme weather events on businesses.

Palau

The consultants visited Koror from 7-9 May 2019 and held meetings with the Weather Service Office (WSO) Palau and their key national stakeholders (refer to Table 1). Stakeholders were invited to share their knowledge and ideas and provide detailed input on potential interventions and activities for Palau within the Concept Note components and outputs. The report summarises the priority issues arising from the face-to-face meetings with each sector stakeholder.

The consultants met 14 representatives of multiple departments within Palau Ministries and Departments: the Ministry of Natural Resources, Environment and Tourism; Ministry of Public Infrastructure, Industries and Commerce; Bureau of National Aviation; Bureau of Agriculture; Bureau of Commercial Development; Bureau of Maritime Security and Fish and Wildlife Protection; Bureau of Marine Transportation; National Emergency Management Office; National Aviation Administration; National Marine Sanctuary; Division of Port State and Navigation; Protected Areas Network; Protected Areas Network Fund; Palau Red Cross Society; and the WSO Palau.

Table 10 shows the Stakeholder Engagement Schedule proposed by the Palau Weather Service Office, **Table 11** lists the Representatives met and **Table 12** is the Stakeholder Table.

Table 7: Palau Stakeholder Engagement Schedule

Dates	Stakeholders
Monday, May 6, 2019	8:30 pm – Arrival of PSS Team in Koror
Tuesday, May 7, 2019	8:00 am – Briefing meeting with Director, Palau Weather Service Office (WSO), and Palau NDA (Senior Advisor, Maritime Affairs & Security & Special Projects) 11:00 am - Protected Areas Network Fund 1:30 pm - Bureau of National Aviation, Ministry of Public Infrastructure, Industry and Commerce 2:30 pm - Bureau of Maritime Security and Fish and Wildlife Protection 6:30 to 9:30pm - People's Empowerment Project Meeting
Wednesday, May 8, 2019	9:30 am - National Emergency Management Office and Palau Automated Land and Resource Information Systems (PALARIS) 10:30 am - Protected Areas Network, Ministry of Natural Resources, Environment and Tourism 2:00 pm - Ministry of Natural Resources, Environment and Tourism
Thursday, May 9, 2019	10:00 am - Bureau of Commercial Development, Division of Port State and Navigation, Bureau of Marine Transportation, Ministry of Public Infrastructure, Industries and Commerce 2:00 pm – Palau International Coral Reef Centre 4:00 pm – Office of Climate Change

Table 8: Participants at Palau Country Engagement

	Participant	Position
1	Maria Ngemaes	Director, Palau Weather Service Office
2	N. Nick Ngwal	Senior Advisor, Maritime Affairs & Security & Special Projects
3	Fernando Sengebau	Director, Bureau of Agriculture, Ministry of Natural Resources, Environment and Tourism
4	William Hayes Moses	Director, Bureau of Commercial Development
5	Regis Emesiochel	General Manager/Executive Director, Protected Areas Network Fund
6	Victor Remengesau	Acting Director, Bureau of Maritime Security and Fish and Wildlife Protection
7	Levan Toktang Akitaya	Chief, Division of Port State and Navigation, Bureau of Marine Transportation, Ministry of Public Infrastructure, Industries and Commerce
8	Thomas Taro	Agricultural Research, Bureau of Agriculture, Ministry of Natural Resources, Environment and Tourism
9	Sandra Matsuda	National Marine Sanctuary
10	King M. Sam	Protected Areas Network, Ministry of Natural Resources, Environment and Tourism
11	Richard Alonz	Civil Aviation Inspector, Palau National Aviation Administration
12	Peter Polloi	Special Advisor on Aviation, Bureau of Aviation, Ministry of Public Infrastructure, Industry and Commerce
13	Waymine Towai	Coordinator, National Emergency Management Office
14	Jun Ushibata	Finance Officer, Marine Protected Areas, Palau Areas Network Fund
15	Wayne Wong	Palau Red Cross Society
16	Yimnang Golbuu	CEO, Palau International Coral Reef Centre
17	David Idip Jr	Senior GIS Analyst- Palau Automated Land and Resource Information Systems (PALARIS),

Summary of Key Discussion Issues

The discussions brought out some common themes. Palau is experiencing the effects of climate change already and government agencies and communities are aware of the need for more detailed local scale information than is currently available. Some of the issues raised are outside the scope of this Programme—the need for advice on how to keep wildlife off the airport runway, driven there by the death of mangrove habitats, caused by the rising sea level, for instance, and the need for training on activity and financial management and reporting for projects.

Palau gets weather and climate information from NOAA in Hawaii, but several stakeholders expressed interest in strengthening Palau's own capacity. Retrieving information from the NOAA website is often slow and is sometimes blocked by security measures. As well, information needs to be verified by in situ measurements and Palau's capacity for this is limited by the cost of equipment. Stakeholders discussed the issue of maintenance costs, inquiring about the possibility of restoring off-line AWSs to use, and recognising that any new equipment must have manageable operating and maintenance costs. Other issues raised included the need for effective communication of information about long-term climate change to government agencies and to all members of communities and about the Palau Weather Service's role in advising on extreme events.

This section briefly summarises the priorities discussed as possible inclusions in the Programme.

- Updating climate resilience and agriculture documents (mainstreaming climate information);
- Discussions on potential interventions: Maritime Safety Information Network (IHO): NAVTEX Service (equipment, installation, operation and maintenance, training); HF Coastal Station; Marine Forecast Training; Aids to Navigation Lights; VHF Service (radio, antenna, staff, etc.); and Dart Buoy;
- Potential ocean climate app—a Palau Weather Services app; real-time display from NOAA tide gauges; ocean services webpage; and sector-specific training on climate and oceans;
- State Management Plans and Conservation Action Plan—process and support for a climate resilience training package;
- Food security—discussions on breadfruit and the Salt-tolerant Taro Project (sand-bagging of taro batches) and Breadfruit Indexing, i.e. identification of climate resilient crops; discussions on benefits of Dry Litter Piggery and Planting of Fruit Trees on Degraded Land—the role of seasonal forecasting;
- Wildlife Hazard Management; and
- Potential for supply of renewable energy equipment.

Table 9: Palau Stakeholder Table

Stakeholder	Interest in the Programme	Influence on the Programme	Proposed role in the Programme	Engagement strategy
All Ministries and Government Departments	The Government of Palau is a primary beneficiary of all Programme interventions: the Programme's objective is to facilitate the flow of climate information that government agencies will use to increase Palau's resilience to climate change impacts.	<p>The support of senior ministry officials will be essential to the success of the National Framework for Climate Services. They must be able to see tangible benefits for their departments from mainstreaming climate information into their policies and planning functions.</p> <p>The support of all ministry staff will be essential to the implementation of the NFCS. The mainstreaming of climate information into their work must address their own priorities for improving their services to communities.</p>	<p>The active engagement of government staff will be critical to the following activities:</p> <ul style="list-style-type: none"> • Working with the national Programme Manager, the Palau Weather Service and consultants to understand how climate considerations can be mainstreamed into the work of their agencies; • Using good quality science and evidence-based information on long-term climate change in planning infrastructure and other development investments and avoiding maladaptation; • Identifying a suite of directly applicable information products relevant to their work; • Participating in a consultative workshop to develop and refine a National Framework for Climate Services; • Agreeing a process for checking the utility of information products regularly and revising them when needed; and • Proactively raising obstacles to mainstreaming with the Programme team throughout the term of the Programme. 	<p>Engagement ensured through:</p> <ul style="list-style-type: none"> • Workshopping the design of the National Framework for Climate Services with PWS and a facilitator; • Technical support and staff training provided to sector focal representatives on climate science, community consultation techniques, etc; and • Opportunities to deliver targeted face-to-face advice to island communities on the implications of climate change in their sector. <p>The PWS will recruit an Awareness Officer who will develop a sector communication plan and monitor its implementation. This will begin the process of mainstreaming climate information into the work of Government Ministries and Departments.</p>
All island communities	Communities are one of the ultimate beneficiaries of all Programme interventions: the Programme's objective is to facilitate the flow of climate information that communities will use to	All Palau's communities are affected by long term climate change impacts—sea level rise causes erosion and salting of arable land, ocean acidification degrades the surrounding reefs and their	<p>Behavioural change is a key measure of the Programme's success: implementing agencies will need the active engagement of communities in making technical information useful to them so that they:</p> <ul style="list-style-type: none"> • Prepare effectively for forecast extreme events; 	<p>Communities are aware that forecasting capability is improved by local observations and request weather stations on each island.</p> <p>Advice will be delivered in Palauan and other commonly used languages.</p>

	<p>increase their resilience to climate change impacts.</p>	<p>productive ecosystems, average temperatures are rising, and rainfall patterns are more erratic.</p> <p>Outer island communities are also at severe and frequent risk from extreme events, particularly the effects of cyclones and of prolonged droughts. The risk is greatly exacerbated by communication difficulties, lack of local data and the high cost and slowness of transport options—both warnings and responses are often delayed, resulting in great hardship and loss of assets and livelihoods.</p>	<ul style="list-style-type: none"> • Advise authorities of approaching water stress in time to prevent hardship; • Manage water resources in accordance with advice on probable rainfall; and • Plan planting schedules and crop varieties on the basis of rainfall advice, etc. <p>Outer island communities have allocated commonly owned land for construction of basic weather stations. A community member will be trained in accurate observation and recording of climate data, as each new station is completed.</p> <p>PWS will seek the input of island communities to refining the outlook for their island, such as establishing practical indicators of approaching water shortages in plenty of time for action: management of stored water, planting short-season crops, early harvest of crops, arranging for potable water to be shipped, etc.</p>	<p>Community representatives will attend the annual National Climate Outlook Forum each year and share advice and recommendations on their return home.</p> <p>PWS will explain the use of the outlook in informing subsistence growers' decision making (with input from the agriculture ministry).</p> <p>If high temperatures are predicted, the outlook may include advice on temporary prohibitions on collecting resources from coral reefs, advice on ciguatera indicators, etc.</p> <p>The benefits of science-informed behaviour change will be communicated widely through Programme reporting.</p>
<p>NGOs, civil society, church groups, island disaster committees</p> <p>Wayne Wong, Palau Red Cross Society</p> <p>Center for Women's Empower-</p>	<p>Civil society organisations will benefit from opportunities to expand work they already do with communities and to extend the range of their activities, building on lessons learnt from pilot projects.</p> <p>The Programme's gender focus will expand opportunities for women to influence</p>	<p>Civil society organisations will be invited to participate in the ongoing development of the National Framework for Climate Information Services in the third year of the Programme, and in the design of community activities.</p> <p>The Red Cross is a trusted organisation with long experience in working closely with communities</p>	<p>Civil society representatives will support the engagement of island communities with Program activities.</p> <p>BoM and SPREP will work with PWS to instigate work on traditional climate knowledge with island communities.</p>	<p>Civil society organisations will lead awareness raising campaigns with the support of the Programme; receive training in professional standard community consultation techniques to ensure women, youngsters, people with disabilities are able to participate fully in consultation; advise Programme implementing agencies on effective communication with their communities.</p>

ment Belau (C-WEB)	communications and to use information products.	and with each island's disaster committee, to prepare for and respond to disasters.		
Stakeholder	Interest in the Programme	Influence on the Programme	Proposed role in the Programme	Engagement strategy
Palau Weather Service Ms Maria Ngemaes, Director PWS	<p>PWS is the principal implementing agency for the Programme. The Programme Implementation Unit team will be located in the PWS office. The team will report to the National Designated Authority (NDA) for Interaction with the GCF, located in the Office of the President.</p> <p>PWS will benefit from the expansion of its data observation network and from Programme support in extending the range of tailored advice it can offer to clients.</p>	<p>PWS's active engagement will be essential to the success of the Programme.</p> <p>PWS is committed to using the Programme to strengthen its provision of information services so that climate information is mainstreamed into the work of government agencies and into science-informed adaptation by communities.</p>	<p>The Programme will enable PWS to extend its observation network to Palau's outer islands and territorial waters, improving the accuracy of its climate forecasting.</p> <p>Additional officers for climate and ocean information services will enable PWS to expand their range of services and to generate tailored products for key sectors. The recruitment of a Climate Officer will allow PWS to take part in SPREP's monthly On-line Climate Outlook Forum and to generate long-range seasonal rainfall forecasts for the country.</p> <p>Modern communication equipment will enable PWS to provide much more reliable information, warnings and advice to remote communities and to receive data from all islands.</p> <p>PWS will be responsible for the maintenance of additional equipment, with the support of regional partners.</p>	<p>Ongoing capacity development and support from the Programme and from regional partners will raise PWS's profile, make the work of its staff more interesting, enable staff to see positive impacts from their work and enable them to influence government policy on a critical development issue.</p> <p>The Programme will enable staff to undertake hands-on work with all communities including outer islands in areas PWS has identified as very high priorities in successive planning documents.</p>
National Emergency Management Office (NEMO) Waymine Towai,	<p>NEMO is the PWS's principal client, focusing on disaster management.</p> <p>It will be a key agency in any activity reducing climate change risks and impacts, and its staff will</p>	<p>NEMO's engagement will be essential to the success of the National Framework for Climate Services.</p> <p>Palau's National Climate Change Policy highlights disaster risk management as a strategic priority and recognises the role of the</p>	<p>NEMO will continue to partner with PWS in activities relating to disaster preparation, warning, management and response.</p> <p>The Programme will enable both agencies to improve their understanding of climate change and its current and future impacts. Structured, funded and supported collaboration between the two agencies will strengthen both, and improve the usefulness</p>	<p>NEMO will benefit from training on effective community consultation. PWS staff may accompany NEMO on regular visits to outer islands particularly when disaster awareness materials are being co-designed with communities, climate and weather terms are being</p>

Coordinator, NEMO	be important partners in the Programme.	<p>PWS and its tracking systems.</p> <p>Palau is able to respond effectively to extreme events but is not well placed to plan for long-term climate change.</p>	<p>of adaptation advice they provide to communities.</p> <p>The proposed purchase of a multi-purpose boat will enable NEMO to conduct search and rescue operations as mandated by Palau's Mass Rescue Operations (MRO) Response and Contingency Plan and to support the outreach programs of other agencies involved in disaster preparedness and response.</p>	<p>determined, the climate outlook is being explained, drought indicators are being worked out, communication methods trialled, and any other activities where PWS's input to NEMO operations will be valuable.</p>
Public media	<p>Palau has a cable TV network and several radio stations, one owned by the Government. Most television comes from the US.</p> <p>Most people have access to mobile phones (112 subscriptions per 100 people, www.cia.gov) and Facebook is a widely used means of communicating public interest messages.</p>		<p>Agencies engaged in the Programme will consider the use of websites and applications to communicate climate information and advice about extreme events.</p> <p>BoM will provide robust and user-friendly equipment such as iPhone and iPad apps, to produce social media and video communication products for stakeholders and communities.</p>	<p>PWSO will engage an expert developer to create an application for mobile devices such as mobile phones and tablets which gives immediate access to detailed, up to date information on local terrestrial and ocean climate conditions.</p> <p>IT expertise will be engaged to update and improve the PWSO's website to make access more user friendly and the information more accessible.</p>
<p>Ministry of Natural Resources, Environment and Tourism</p> <p>Fernando Sengebau, Director, Bureau of Agriculture, MNRET</p>	<p>Tourism is a major industry in Palau and depends on preservation of the country's great natural beauty.</p> <p>Protection of its coral reefs is a very high priority for the Government of Palau.</p>	<p>Accessible climate information is valuable to MNRET and the agency is interested in improving its understanding of climate science and its use of down-scaled climate information in environmental protection.</p>	<p>The Government proposes to involve its PAN, Marine Protected Areas and National Marine Sanctuary agencies in the development and implementation of the National Framework for Climate Services, to mainstream climate information into their planning.</p> <p>All the agencies engaged in environmental protection, coral research, tourism policy and related fields will benefit from greater understanding of climate science and input</p>	<p>Engagement ensured through:</p> <ul style="list-style-type: none"> • Workshopping the design of the National Framework for Climate Services with PWS and a facilitator; • Technical support and staff training provided to sector focal representatives on climate science, community consultation techniques, etc; and

Protected Areas Network (PAN) King M Sam (PAN)			to the ways climate information is provided to them.	<ul style="list-style-type: none"> Opportunities to deliver targeted face-to-face advice to island communities on the implications of climate change in their sector.
Maritime Affairs & Security and Special Projects Nick Ngwal, Senior Advisor Bureau of Maritime Security and Fish and Wildlife Protection Victor Remengesau Acting Director	Safety of life at sea (SOLAS) is a major issue for Palau. Lack of up to date meteorological data and other maritime safety information is a great risk to the safety of maritime navigation and has resulted in loss of lives and property during storms at sea, vessel groundings and collisions with floating obstructions. Search and rescue operations for foundered vessels, often including divers, increase the cost of government operations and strains limited resources.	Maritime safety agencies will be invited to contribute to the National Framework for Climate Services facilitated workshop in the first year of the Programme. Their advice to PWS on useful information products will be an essential step in reducing the cost of search and rescue, reducing loss of life and assets.	The support of senior ministry officials will be essential to the success of the National Framework for Climate Services. Agencies' inputs will be sought by PWS's climate, ocean science and awareness officers to establishing the information products they need throughout the term of the Programme at annual workshops and other formal interactions.	Maritime safety agencies will be invited to engage with the Programme and PWS from the first stages of Programme implementation and regularly throughout its term. They will benefit directly from National Climate Outlook Forum presentations each April before the cyclone season.
Ministry of Public Infrastructure, Industries and Commerce Palau National Aviation Administration	Aviation authorities are interested in improved meteorological information during extreme events and in the long-term impact of climate change on their infrastructure.		Agencies' inputs will be sought by PWS's climate, ocean science and awareness officers to establishing the information products they need throughout the term of the Programme at annual workshops and other formal interactions.	Agencies will be invited to contribute to the National Framework for Climate Services facilitated workshop in the first year of the Programme.

Health Ministry	Seasonal forecast information and information on predictable long term changes have potential to help the Ministry of Health to manage disease risks and climate related ill-health more effectively. Early prediction of drought can reduce the impacts of severe shortages of water for drinking and washing. It may be possible to forecast the risk of dengue and other vector-borne disease outbreaks.	MoH will be invited to contribute to the initial draft of the National Framework for Climate Services, in a facilitated workshop in the first year of the Programme. MoH staff will be asked to explain what kinds of information would be useful to them to reduce avoidable ill-health, disease outbreaks and injuries from extreme events.	MoH's main role in the Programme will be as users of information. Its staff will be regularly consulted about the continuing usefulness of information products.	MoH officers may be invited to accompany NEMO and PWS on visits to outer islands to explain the implications of seasonal forecasts for community health.
Stakeholder	Interest in the Programme	Influence on the Programme	Proposed role in the Programme	Engagement strategy
Pacific Regional Environment Programme (SPREP)	The Manager of the Programme's multi-country hub will be located on the SPREP campus, but independent of SPREP. SPREP hosts the Pacific Meteorological Council and the Pacific Climate Change Centre and is an important source of support to Pacific Meteorological Services who are principal partners in the Program. WMO's Pacific representative is also located in Apia, Samoa.	SPREP has particular strengths and experience in community engagement and in technical support. SPREP's PacMetDesk manages a monthly teleconference with Pacific in which each climate officer checks his/her current seasonal forecast, generated from local data using SCOPIC. Palau's new climate officer will receive training in using SCOPIC. The seasonal forecast is the foundation for NMSs' advice on probable rainfall	SPREP will continue its ongoing support to Palau, contributing to a support base shared among all Pacific NMSs. This includes: <ul style="list-style-type: none"> • Maintaining the code of the climate data management system (CliDE) used by all Pacific NMSs; • Maintaining SCOPIC to ensure TMS's seasonal forecasts are accurate; • Continuing the Online Climate Outlook Forum to develop PWS's Climate Officer's confidence in generating and explaining the monthly seasonal forecasts; • Developing new data products using PWS's CliDE data. • Providing lessons from previous community awareness projects and 	The Programme will enable SPREP to build on existing work with PWS in areas identified as high priorities by both organisations. SPREP is a longstanding partner with Pacific NMSs with broad experience in technical support, ecosystem management and working with communities. SPREP will be closely engaged throughout the term of the Programme, as it provides capacity development to PWS through assistance with workshops, provision of training and development of new tools.

	<p>Many of SPREP's own activities will complement the Programme and the Programme will build on successful past pilot projects.</p> <p>SPREP's Inform Project will contribute to PWS's strengthened data management.</p>	<p>for the 3 to 9 months ahead and will be a valuable addition to PWS's services. SPREP's support is essential to PWS's provision of the advice of most interest to Palau's farmers, water managers, disaster managers and health authorities.</p>	<p>practical adaptation projects in Palau and with other atoll countries;</p> <ul style="list-style-type: none"> • Developing training modules in meteorology and climatology for PWS staff; • Sourcing specialised advice within SPREP's other divisions to support the Programme's work with sector clients; and • Hosting Palau's climate data in its Inform database. <p>SPREP will lead a workshop in Palau to develop community-based response plans for extreme weather / climate events. This will include a strong gender focus.</p>	
The Pacific Community (SPC)	<p>SPC will make a major contribution to the addition of oceanographic services to PWS's capabilities. The extension of observation capacity to Palau's ocean areas will also benefit SPC's climate monitoring and analysis capacity.</p>	<p>SPC will contribute procurement expertise to the Programme ensuring purchases of modern observing equipment represent value for money and will assist PWS with training in use and maintenance, with ongoing technical support.</p> <p>SPC will ensure that its related work complements Programme activities.</p>	<p>SPC will continue its ongoing support to PWS, contributing to a support base shared among all Pacific NMSs. This includes:</p> <ul style="list-style-type: none"> • Providing regional oceanographic services, and extending and down-scaling the services through the Programme; and • Supporting PWS as it begins to build capacity in ocean information services, through training and attachments. <p>SPC maintains and provides access to the Pacific Ocean Portal originally developed by BoM through COSPPac: the Portal allows a user with limited internet access to select a location and a sector such as tourism, fisheries, and shipping, ask for ocean parameters such as sea temperature, wave heights, coral bleaching, currents, salinity and chlorophyll, and receive the information visualised as maps and diagrams.</p>	<p>Training and attachments for PWS's staff and especially the new climate services, ocean services and awareness officers will ensure collaboration and identification of synergies.</p>

Stakeholder	Interest in the Programme	Influence on the Programme	Proposed role in the Programme	Engagement strategy
<p>US National Ocean and Atmosphere Administration (NOAA)</p> <p>Ray Tanabe</p>	<p>The Palau Weather Service Office (PWSO) is a component of NOAA.</p> <p>The PWSO provides on-ground weather observation data to NOAA Hawaii and receives from NOAA a range of data and information products on both weather and climate.</p>	<p>NOAA will contribute tools, research and communication services to the Programme.</p> <p>Its ongoing support will be vital for PWSO as it takes on new staff, expands its observation network and establishes active relationships with key government departments and NGOs.</p>	<p>NOAA's Pacific Regional Integrated Sciences and Assessments (RISA) programme at the East-West Center identified climate impacts on human health and the prevalence of drought and wildfire as key priorities for Palau. RISA is working with the USDA Forest Service and Palau Division of Forestry to define climate services needs and to improve climate information delivery to the forestry sector to aid in wildfire prevention.</p> <p>The U.S. Integrated Ocean Observing System (PacIOOS) proposes a multi-component service for Palau with multiple modelled forecast products that build upon and complement each other. Atmospheric, wave and inundation forecasts will be publicly available through the website and other platforms.</p>	<p>NOAA is actively engaged with PWSO and is an implementing partner in research and communication activities.</p> <p>UH's East-West Center is currently engaged in multiple projects to produce new climate-related products and services that stakeholders in Palau have requested.</p>
<p>Australian Bureau of Meteorology (BoM)</p>	<p>BoM is a long-term partner of Pacific meteorological services, in accordance with its responsibility as a developed country member of WMO.</p> <p>Australia has supported essential meteorological services in Pacific countries for many decades and more recently has contributed systematic support for NMSs as they have built</p>	<p>BoM continues to deliver the Climate and Oceans Support Program in the Pacific (COSPPac), supporting the achievement of NMS's priorities for delivery of reliable and accessible climate information services.</p> <p>The Programme will coordinate regularly with BoM to ensure the coordination of activities.</p>	<p>Palau's new climate services, ocean services and awareness officers will undertake training and attachments at BoM over the life of the Programme.</p> <p>BoM will deliver training in Palau on seasonal prediction using ACCESS-S software and on the use of information in preparing for the tropical cyclone season and for climate extremes such as droughts and floods. PWS staff will learn the use of ACCESS-S for seasonal forecasting for ocean conditions.</p> <p>BoM will help PWS staff on attachment to prepare scientific material for publication and provide opportunities for them to present papers and posters at climate conferences.</p>	<p>BoM is an implementing partner engaged in related activities with Palau in which PWS is the primary stakeholder.</p> <p>Australia is committed to assisting Pacific countries to adapt to climate change.</p>

	capacity in the provision of local climate services.		BoM will conduct workshops in partnership with PWS to build the scientific understanding of staff and their capacity to explain to their clients the application of climate monitoring and prediction products to their sectors.	
Stakeholder	Interest in the Programme	Influence on the Programme	Proposed role in the Programme	Engagement strategy
New Zealand National Institute for Water and Atmospheric Research (NIWA)	NIWA has a long relationship with Pacific NMSs and particularly the Polynesian countries such as Tuvalu. New Zealand funded the maintenance of essential observing equipment in neighbouring countries for many years and has expertise in providing and maintaining robust equipment suitable for tropical environments and limited local technical capacity.	NIWA has developed a range of tools for use in Pacific countries using CliDE data—the CliDE Client Services suite, or CliDEsc.	NIWA will contribute to training and technical support for installation, calibration and site inspections for new observation and monitoring equipment. Training will be delivered in Palau and at the NIWA Instrument Laboratory.	New Zealand is committed to assisting Pacific countries to adapt to climate change.
Palau's private sector	Palau's private sector is concentrated in small commercial crop growers, subsistence agriculture and artisanal fishing (addressed through collaboration with sector agencies). Tourism is a major contributor to GDP. Palau's policy is to limit tourist numbers to reduce pressure on its natural	The private sector will be invited to contribute to the reiterative development of the National Framework for Climate Services in the second year of the Programme. PWSO will work with businesses to identify tailored climate information services that will build capacity to climate change and enable businesses to	The private sector's principal role will be as a consumer of information services and representatives will be asked to work with the Programme and PWSO to establish their information needs. These are expected to be in the areas of improved resilience of infrastructure and in protection of the natural environment on which the tourism industry relies.	The Programme will publicise the benefits of using climate information to minimise the destructive impacts of climate change and extreme weather events on businesses.

	environment, and to attract high-end tourists.	minimise the loss of assets to extreme climate events.		
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Republic of the Marshall Islands

The consultants visited the Marshall Islands from 29 April to 3 May 2019 and held meetings with the Weather Service Office (WSO) Majuro and their key national stakeholders (refer to Table 1). Stakeholders were invited to share their knowledge and ideas and provide detailed input on potential interventions and activities for the Marshall Islands within the scope of the Concept Note's components and outputs. The report summarises the priority issues arising from the face-to-face meetings with each sector stakeholder.

The consultants met 13 representatives of multiple departments within the Marshall Islands Ministries and Offices: the Ministry of Finance; Ministry of Health; Ministry of Public Works; Ministry of Resources and Development; Office of Environmental Planning and Policy Coordination; National Disaster Management Office; Marine Resource Authority; Environmental Protection Authority; and the WSO Majuro. The consultants also met representatives from the Marshall Islands Red Cross Society and the Pacific Regional Environment Programme.

Table 4 shows the Stakeholder Engagement Schedule proposed by the Weather Service Office Majuro, **Table 5** lists the Representatives met and **Table 6** is the Stakeholder Table.

Table 10: Marshall Islands Stakeholder Engagement Schedule

Dates	Stakeholders
Tuesday, April 30, 2019	10:30 am - Arrival of PSS Team in Majuro 1:30 pm - Briefing meeting with Director, Weather Service Office (WSO), and Deputy Director, Office of Environment Planning & Policy Coordination (OEPPC) 3:00pm – Finance Advisor, Office of Environment Planning and Policy Coordination
Wednesday, May 1, 2019	Public Holiday
Thursday, May 2, 2019	9:00 am - National Disaster Management Office 1.30 pm - Ministry of Health 2.30 pm - Division of Agriculture, Ministry of Resources and Development 4:00 pm – Ministry of Public Works
Friday, May 3, 2019	11:00 am - Marshall Islands Red Cross Society 2:00 pm - Ministry of Marine Resources Authority 3:00 pm - Ministry of Culture and Internal Affairs 5:00 pm - Deputy Chief Secretary, Office of the Chief Secretary

Table 11: Participants at Marshall Islands Country Engagement

	Participant	Position
1	Reginald White	Director, Weather Service Office Majuro
2	Warwick Harris	Deputy Director, Office of Environmental Planning and Policy Coordination
3	Timmy Langrine	Director, National Disaster Management Office
4	Francyne Wase-Jacklick	Ministry of Health
5	Melvin Dacillo	Engineer, Ministry of Public Works
6	Florence Edwards	Coastal and Community Affairs, Marine Resources Authority
7	Lani Milne	Chief, Coastal Land and Conservation, Environmental Protection Authority
8	Ywao Elenzo	Finance Officer, Office of Environmental Planning and Policy Coordination
9	Risa Kabua Myazoe	Division of Agriculture, Ministry of Resources and Development
10	Henry Capelle	Chief of Quarantine, Ministry of Mineral Resources and Commerce
11	Brooke Takala Abraham	Secretary-General, Marshall Islands Red Cross Society
12	Harry Herming	Disaster Management Officer, Marshall Islands Red Cross Society
13	Kilom Ishiguro	Technical Expert (Water Sector), Pacific Regional Environment Programme
14	Abacca Anjain-Maddison	Deputy Chief Secretary, Office of the Chief Secretary
15	Iva Reimers-Roberto	Secretary, Ministry of Mineral Resources and Commerce
16	Janet Schmidt	Disability Coordinator, Ministry of Culture and Internal Affairs
17	Karina M. de Brum	Human Rights, Ministry of Culture and Internal Affairs
18	Teri Elbon	Ministry of Culture and Internal Affairs
19	Rebecca Lorennij	Ministry of Culture and Internal Affairs
20	Lee Jacklick	Weather Service Office Majuro

The consultants started their in-country consultations with a briefing meeting with Reginald White, Director of the WSO Majuro and Warwick Harris, Deputy Director of the Office of Environment Planning and Policy Coordination (OEPPC), who represented Clarence Samuel, the National Designated Authority (NDA) for RMI.

This was followed by a general briefing meeting with the representatives from key sectors (proposed by the WSO Majuro), which led to individual meetings with representatives and heads of departments of the invited sectors. The consultants introduced the proposed Programme components, background and objectives of the in-country stakeholder consultation. Sector representatives were invited to share their input on departmental and sector barriers and existing information gaps. Each meeting included in-depth discussion on the department's requirements for climate and ocean related sector-specific products and services, potential interventions and tools that build on past and current development initiatives to enhance sustainability. Also discussed were national institutional arrangements that would strengthen access, delivery and use of climate and ocean information and knowledge services by key stakeholders, agencies and communities.

The Marshall Islands are atolls and very vulnerable to climate change impacts. Inhabited islands have outposted National Disaster Management Office staff, who provide the link between the WSO Majuro and community members, explaining forecasts and warnings. The Marshall Islands Red Cross is also active in outer islands, helping people prepare for extreme events and to minimise damage.

Summary of Key Discussion Issues

- Importance of CLiDE database management and SCOPIC training;
- Value of a Stakeholder Roundtable and NCOF;
- Requirement for an Awareness Officer at NDMO including training of the officer at WSO and other relevant agencies;
- Support for a Drought Response Plan: training package for NDMO focal points to improve communications and information to the community on drought and response actions;
- Need for support to improve community awareness and understanding of weather messages;
- Support for Pacific Trainer / Local Trainer / Training Packages to understand Statements issued from WSO;
- Value of a Climate and Weather Service Glossary;
- Importance of funding salaries for 5 years for 24 Agriculture Extension Officers in outer islands;
- Need for communications with outer islands;
- Understanding and communicating the health implications of WSO statements;
- Review of effectiveness of health messages and communication mediums to communities;
- Need for more information from WSO e.g. SST and tailor-made products; and
- Enhancing capacity in RMI on project management.

The importance of building on current and ongoing projects, initiatives and tools was also discussed. Related activities include:

- the planned UNDP Project;
- INFORM Project and the 2015 RMI State of the Environment Report;
- Discussion of the IFRC WMO Proposal;
- Discussion of ERT Forums;
- WUTMI (Women United Together Marshall Islands) health work in communities (on-air and radio awareness, translation of Ministry of Health messages, and establishment of Health Warriors for Dengue, Chikungunya and Zika);
- Development of EWS for Health/Outbreaks;
- Aquaculture and Aquarium Exports, FAD, and Observer Programme;
- the GCCA / SPC Causeway Project (Ministry of Public Works);
- Standards Design Booklet for Climate Resilient Housing;
- Retrofitting Evacuation Centres; and
- Ministry proposal to GCF for infrastructure development.

Discussion with stakeholders elicited the following suggestions:

- Development of training materials and delivery of train-the-trainer courses for WSO and key stakeholders, such as the Marshall Islands Red Cross Society and National Disaster Management Office;
- Development of visuals and climate and ocean awareness toolkits including billboards for community level information;
- Expand NOAA's Agro-forestry Dashboard;
- Supply of Renewable Energy Units for water for farming during droughts;
- Hydroponic projects in outer islands;
- Addressing Ministry of Health top three priorities: Communications (Surveillance systems); Training; and Communications Infrastructure;
- Fisheries Resource Management Plans for communities;
- Temperature loggers in the lagoon and inundation mapping; and
- Coral bleaching and NOAA Coral Bleaching Dashboard.

Table 12: Marshall Islands Stakeholder Table

Stakeholder	Interest in the Programme	Influence on the Programme	Proposed role in the Programme	Engagement strategy
All Ministries and Government Departments	The Government of RMI is a primary beneficiary of all Programme interventions: The Programme's objective is to facilitate the flow of climate information that government agencies will use to increase the Marshall Islands' resilience to climate change impacts.	<p>The support of senior ministry officials will be essential to the success of the National Framework for Climate Services. They must be able to see tangible benefits for their departments from mainstreaming climate information into their policies and planning functions.</p> <p>The support of all ministry staff will be essential to the implementation of the NFCS. The mainstreaming of climate information into their work must address their own priorities for improving their services to the people of the Marshall Islands.</p>	<p>The active engagement of government staff will be critical to the following activities:</p> <ul style="list-style-type: none"> • Developing a basic understanding of climate science through training delivered by the Weather Service Office, Majuro with the support of the Programme and regional partners; • Working with the national Programme Manager, WSO and consultants to understand how climate considerations can be mainstreamed into the work of their agencies; • Participating in a consultative workshop to develop and refine a National Framework for Climate Services; • Identifying a suite of directly applicable information products relevant to their work; • Agreeing a process for checking the utility of information products regularly and revising them when needed; • Using good quality science and evidence-based information on long-term climate change in planning infrastructure and other development investments and avoiding maladaptation; • Learning techniques for communicating climate science to the clients of their departments; and 	<p>Engagement ensured through:</p> <ul style="list-style-type: none"> • Workshopping the design of the National Framework for Climate Services with WSO and a facilitator; • Drafting a Climate Information Services Sector Action Plan and a Communication Plan for an agreed number of important sectors; • Technical support and staff training provided to sector agencies on climate science, community consultation techniques, etc; and • Opportunities to deliver targeted face-to-face advice to island communities on the implications of climate change in their sector. <p>The WSO will recruit an Awareness Officer who will develop a sector communication plan and monitor its implementation. This will begin the process of mainstreaming climate information into the work of Government Ministries and Departments.</p>

			<ul style="list-style-type: none"> Proactively raising obstacles to mainstreaming with the Programme team throughout the term of the Programme. 	
All island communities	Communities are one of the ultimate beneficiaries of all Programme interventions: The Programme's objective is to facilitate the flow of climate information that communities will use to increase their resilience to climate change impacts.	<p>All RMI's communities are affected by long term climate change impacts—sea level rise causes erosion and salting of arable land, ocean acidification degrades the surrounding reefs and their productive ecosystems, average temperatures are rising, and rainfall is more intense.</p> <p>Outer island communities are also at severe and frequent risk from extreme events, particularly the effects of cyclones and of prolonged droughts. The risk is exacerbated by communication difficulties, lack of local data and the high cost and slowness of transport options—both warnings and responses are often delayed, resulting in great hardship and loss of assets and livelihoods.</p>	<p>Behavioural change is a key measure of the Programme's success: implementing agencies will need the active engagement of communities in making technical information useful to them so that they:</p> <ul style="list-style-type: none"> Prepare effectively for forecast extreme events; Advise authorities of approaching water stress in time to prevent hardship; Manage water resources in accordance with advice on probable rainfall; Plan planting schedules and crop varieties on the basis of rainfall advice; and Impose temporary protection on reefs stressed by high temperatures, etc. <p>New observation and monitoring equipment in 14 outer islands will be sited on Government-owned land. A community member will be trained in accurate observation and recording of climate data, as new stations are completed.</p> <p>WSO will seek the input of island communities to refining the outlook for their island, so that they can provide the information of most use, in a usable format.</p>	<p>Communities are aware that forecasting capability is improved by local observations and request weather stations on each island.</p> <p>Advice will be delivered in Marshallese and other commonly used languages.</p> <p>Community representatives will attend the annual National Climate Outlook Forum each year in April and share advice and recommendations on their return home.</p> <p>WSO will explain the use of the outlook in informing subsistence growers' decision-making (with input from the agriculture ministry).</p> <p>If high temperatures are predicted, the outlook may include advice on temporary prohibitions on collecting resources from coral reefs, advice on ciguatera indicators, etc.</p> <p>The benefits of science-informed behaviour change will be communicated widely through Programme reporting.</p>
NGOs, civil society, church	Civil society organisations will benefit from opportunities to expand	Civil society organisations will be invited to participate in the ongoing	Civil society representatives will support the engagement of island communities with Programme activities. They will help to	Civil society organisations will lead awareness raising campaigns with the support of

groups, island disaster committees Marshall Islands Red Cross Society (MIRCS) Brooke Takala Abraham, Secretary-General MIRCS Women United Together Marshall Islands (WUTMI)	work they already do with communities, build on successful pilot projects and to extend the range of their activities, building on lessons learnt from pilot projects. The Programme's gender focus will expand opportunities for women to influence preferred communication techniques and to use information products.	development of the National Framework for Climate Information Services in the third year of the Programme, and in the design of community activities. The Red Cross is a trusted organisation with long experience in working closely with communities and with each island's disaster focal point and NDMO's outposted officers, to prepare for and respond to disasters.	bridge the gap between the science team and the end users in explaining predicted impacts of climate change. BoM and SPREP will work with the Programme to instigate work on traditional climate knowledge (TK) with island communities. As the Programme advances, WSO will begin the integration of TK into weather and climate advice with support from regional partners.	the Programme; receive training in professional standard community consultation techniques to ensure women, youngsters, people with disabilities are able to participate fully in consultation; advise Programme implementing agencies on effective communication with their communities.
Stakeholder	Interest in the Programme	Influence on the Programme	Proposed role in the Programme	Engagement strategy
Weather Service Office, Majuro (WSO) Mr Reginald White, Director WSO	WSO is the principal implementing agency for the Programme. The Programme Implementation Unit team will be located in the WSO office. The team will report to the National Designated Authority (NDA) for Interaction with the GCF, located in the Office of Environment Planning and Policy Coordination (OEPPC).	WSO's active engagement will be essential to the success of the Programme. WSO is committed to using the Programme to strengthen its provision of information services so that climate information is mainstreamed into the work of government agencies and into science-informed adaptation by communities.	The Programme will enable WSO to extend its observation network to RMI's outer islands and territorial waters, improving the accuracy of its climate forecasting. Additional officers for climate and ocean information services will enable WSO to expand their range of services and to generate tailored products for key sectors. The recruitment of a Climate Officer will allow WSO to expand its outreach to government agencies and communities. Modern communication equipment will enable WSO to provide much more reliable information, warnings and advice to remote	Ongoing capacity development and support from the Programme and from regional partners will raise WSO's profile, make the work of its staff more interesting, enable staff to see positive impacts from their work and enable them to influence government policy on a critical development issue. The Programme will enable staff to undertake hands-on work with all communities including outer islands in areas WSO has

	WSO will benefit from the expansion of its data observation network and from Programme support in extending the range of tailored advice it can offer to clients.		<p>communities and to receive data from all islands.</p> <p>WSO will be responsible for the maintenance of additional equipment, with the support of regional partners.</p> <p>The Programme will enable WSO to draft a National Meteorology Act which will formalise its role and functions in the provision of climate and weather information services and its relationships with other agencies.</p> <p>A National Meteorological Strategy will then be drafted to document the process by which RMI will put its Meteorology Act into operation.</p>	identified as very high priorities in successive planning documents.
<p>National Disaster Management Organisation (NDMO)</p> <p>Timmy Langrine, NDMO</p>	<p>NDMO is an established partner of the WSO in the disaster management provision of end to end disaster management services.</p> <p>It will be a key agency in any activity reducing climate change risks and impacts, and its staff will be important partners in the Programme.</p> <p>RMI is able to respond effectively to extreme events but is not well placed to plan for long-term climate change. The Programme will build NDMO's capacity to reduce disaster risks and</p>	<p>NDMO's engagement will be essential to the success of the National Framework for Climate Services.</p> <p>NDMO will be consulted during the drafting of the proposed Meteorology Act to recognise the complementary responsibilities of the WSO and the NDMO.</p>	<p>NDMO will continue to partner with WSO in activities relating to disaster preparation, warning, management and response.</p> <p>The Programme will enable both agencies to improve their understanding of climate change and its current and future impacts. Structured, funded and supported collaboration between the two agencies will strengthen both and improve the usefulness of adaptation advice they provide to communities.</p>	<p>NDMO will benefit from training on effective community consultation. WSO staff may accompany NDMO on visits to outer islands particularly when disaster awareness materials are being co-designed with communities, climate and weather terms are being determined, the climate outlook is being explained, drought indicators are being worked out, communication methods trialled, and any other activities where WSO's input to NDMO operations will be valuable.</p>

	the impacts of climate change.			
Public media	<p>RMI has seven radio stations and three television channels, two of them associated with the US military. Most television comes from the US.</p> <p>Ownership of mobile phones is low (3 subscriptions per 100 people, www.cia.gov).</p>	<p>The Programme will work with NOAA, the University of Hawaii (UH) and RMI on the development of National Ocean Portals and a regional portal for the two North Pacific countries.</p> <p>Other regional partners—SPC, SPREP, NIWA, BoM and Meteo-France—will also be involved. The activity will create dashboards that draw data from the portal's many sources to create tailored information products for users.</p>	<p>Agencies engaged in the Programme will consider the use of websites and applications to communicate climate information and advice about extreme events.</p> <p>BoM will provide robust and user-friendly equipment such as iPhone and iPad apps, to produce social media and video communication products for stakeholders and communities.</p>	<p>WSO will engage an expert developer to create an application for mobile devices such as mobile phones and tablets which gives immediate access to detailed, up to date information on local terrestrial and ocean climate conditions.</p> <p>IT expertise will be engaged to update and improve the WSO's website to make access more user friendly and the information more accessible.</p>
Stakeholder	Interest in the Programme	Influence on the Programme	Proposed role in the Programme	Engagement strategy
<p>Marshall Islands Conservation Society (MICS)</p> <p>Marshall Islands Marine Resource Authority (MIMRA)</p>	<p>RMI has several agencies with responsibilities for monitoring, reporting on and protecting its environment.</p>	<p>Accessible climate information is valuable to MICS and MIMRA and they are interested in improving their understanding of climate science and the use of down-scaled climate information in environmental protection and adaptation.</p>	<p>All the agencies engaged in environmental protection, coral research, tourism policy and related fields will benefit from greater understanding of climate science and input to the ways climate information is provided to them.</p> <p>The Programme will fund a regional conference or workshop to analyse and assess the correlation of coral bleaching data and predictions for model refinement and predicting skill development—this will benefit all Pacific countries.</p>	<p>Engagement ensured through:</p> <ul style="list-style-type: none"> • Workshopping the design of the National Framework for Climate Services with WSO and a facilitator; and • Technical support and staff training provided to sector representatives on climate science, community consultation techniques, etc.
Ministry of Culture and	The Disability Coordination Office in the Human Rights and Community Development	This activity will make the Republic of the Marshall Islands a barrier-free country for people with	The Marshall Islands Disabled Persons Organization, established as an advocacy group, will partner with the National Disaster Risk Reduction and Preparedness	Agencies will be invited to contribute to the National Framework for Climate Services

Internal Affairs Karina M de Brum, Human Rights Janet Schmidt, Disability Coordinator	Division at the Ministry of Culture and Internal Affairs will partner with the Disabled Persons Organization to ensure effective communication on disability-inclusive programming for climate change and disaster preparedness activities.	disabilities in relation to effective communication and information sharing on climate change and disaster preparedness.	committee to ensure climate change and disaster risk information is accessible to everyone.	facilitated workshop in the first year of the Programme.
Health Ministry	Seasonal forecast information and information on predictable long-term changes have potential to help the Ministry of Health to manage disease risks and climate related ill-health more effectively. Early prediction of drought can reduce the impacts of severe shortages of water for drinking and washing. It may be possible to forecast the risk of dengue and other vector-borne disease outbreaks.	MoH will be invited to contribute to the initial draft of the National Framework for Climate Services, in a facilitated workshop in the first year of the Programme. MoH staff will be asked to explain what kinds of information would be useful to them to reduce avoidable ill-health, disease outbreaks and injuries from extreme events.	MoH's main role in the Programme will be as users of information. Its staff will be regularly consulted about the continuing usefulness of information products. MoH is achieving high success rates in disease surveillance and preparation for disease outbreaks by engaging with island women's groups.	MoH will be invited to contribute to the National Framework for Climate Services facilitated workshop in the first year of the Programme. MoH officers may be invited to accompany NDMO and WSO on visits to outer islands to explain the implications of seasonal forecasts for community health.
Ministry of Resources and Development Risa Kabua Myazoe,	The development of climate resilient communities requires adaptation strategies that result in paradigm shifts to normal food security strategies.	MRD's engagement with Programme training opportunities will be essential to the introduction of climate science to island communities, and to	The Programme will help MRD and the Agriculture Division to extend climate and ocean data-driven analysis to the community level to increase sustainable methods of food production and protection. Agriculture has extension officers who work directly with communities and WSO's new	MRD and its Departments and Bureaus will be invited to contribute to the National Framework for Climate Services facilitated workshop in the first year of the Programme.

Division of Agriculture	Adaptation strategies need analysis of climate and ocean data to inform the sustainable management of resources.	successful adaptation by subsistence farmers.	climate and awareness (communications) officers will engage with them.	MRD will engage with the Programme and PWS from the first stages of Programme implementation and regularly throughout its term. They will benefit directly from National Climate Outlook Forum presentations each April before the cyclone season.
Stakeholder	Interest in the Programme	Influence on the Programme	Proposed role in the Programme	Engagement strategy
Pacific Regional Environment Programme (SPREP)	<p>The Manager of the Program's multi-country hub will be located on the SPREP campus, but independent of SPREP. SPREP hosts the Pacific Meteorological Council and the Pacific Climate Change Centre and is an important source of support to Pacific Meteorological Services who are principal partners in the Programme. WMO's Pacific representative is also located in Apia, Samoa.</p> <p>Many of SPREP's own activities will complement the Programme and the Programme will build on successful past pilot projects.</p> <p>SPREP's Inform Project will contribute to WSO's</p>	<p>SPREP has particular strengths and experience in community engagement and in technical support. SPREP's PacMetDesk manages a monthly teleconference with Pacific in which each climate officer checks his/her current seasonal forecast, generated from local data using SCOPIC.</p> <p>The seasonal forecast is the foundation for NMHSs' advice on probable rainfall for the 3 to 9 months ahead. SPREP's support is essential to WSO's provision of the advice of most interest to RMI's farmers, water managers, disaster managers and health authorities.</p>	<p>SPREP will continue its ongoing support to RMI, contributing to a support base shared among all Pacific NMSs. This includes:</p> <ul style="list-style-type: none"> • Maintaining the code of the climate data management system (CliDE) used by all Pacific NMSs; • Maintaining SCOPIC to ensure RMI's seasonal forecasts are accurate; • Continuing the Online Climate Outlook Forum to maintain WSO's Climate Officer's confidence in generating and explaining the monthly seasonal forecasts; • Developing new data products using WSO's CliDE data; • Providing lessons from previous community awareness projects and practical adaptation projects in RMI and with other atoll countries; • Developing training modules in meteorology and climatology for WSO staff; 	<p>The Programme will enable SPREP to build on existing work with WSO in areas identified as high priorities by both organisations.</p> <p>SPREP is a longstanding partner with Pacific NMSs with broad experience in technical support, ecosystem management and working with communities.</p> <p>SPREP will be closely engaged throughout the term of the Programme, as it provides capacity development to WSO through assistance with workshops, provision of training and development of new tools.</p> <p>SPREP's Inform data management project will be an integral part of the Programme.</p>

	strengthened data management.		<ul style="list-style-type: none"> • Sourcing specialised advice within SPREP's other divisions to support the Programme's work with sector clients; and • Hosting RMI's climate data in its Inform database. <p>SPREP will lead a workshop in RMI to develop community-based response plans for extreme weather / climate events. This will include a strong gender focus.</p> <p>The Programme will support the recruitment and training of a national coordinator (NC) who will work within the Office of Environment Planning & Policy Coordination (OEPPC). The NC's role is to publicise the RMI Environmental Data Portal, to extend its user base and to help the users of its data to maximise their skills.</p>	
The Pacific Community (SPC)	SPC will make a major contribution to the addition of oceanographic services to WSO's capabilities. The extension of observation capacity to RMI ocean areas will also benefit SPC's climate monitoring and analysis capacity.	<p>SPC will contribute procurement expertise to the Programme ensuring purchases of modern observing equipment represent value for money and will assist WSO with training in use and maintenance, with ongoing technical support.</p> <p>SPC will ensure that its related work complements Programme activities.</p>	<p>SPC will continue its ongoing support to WSO, contributing to a support base shared among all Pacific NMSs. This includes:</p> <ul style="list-style-type: none"> • Providing regional oceanographic services, and extending and down scaling the services through the Programme; and • Supporting WSO as it begins to build capacity in ocean information services, through training and attachments. <p>SPC maintains and provides access to the Pacific Ocean Portal originally developed by BoM through COSPPac: the Portal allows a user with limited internet access to select a location and a sector such as tourism, fisheries, and shipping, ask for ocean parameters such as sea temperature, wave heights, coral bleaching, currents, salinity</p>	Training and attachments for WSO's staff and especially the new climate services, ocean services and awareness officers will ensure collaboration and identification of synergies.

			and chlorophyll, and receive the information visualised as maps and diagrams.	
Stakeholder	Interest in the Programme	Influence on the Programme	Proposed role in the Programme	Engagement strategy
<p>US National Ocean and Atmosphere Administration (NOAA)</p> <p>Ray Tanabe, NOAA, Hawaii</p> <p>University of Hawaii (UH)</p>	<p>The Weather Service Office (WSO) Majuro is a component of NOAA.</p> <p>The WSO provides on-ground weather observation data to NOAA Hawaii and receives from NOAA a range of data and information products on both weather and climate.</p> <p>NOAA NWS Weather Forecast Offices in Guam and Honolulu prepare and provide weather forecasts, watches, warnings and advisories to the Marshall Islands.</p>	<p>NOAA will contribute tools, research and communication services to the Programme.</p> <p>Its ongoing support will be vital for WSO as it takes on new staff, expands its observation network and establishes active relationships with key government departments and NGOs.</p>	<p>The U.S. Integrated Ocean Observing System (PacIOOS) proposes a multi-component service for RMI with multiple modelled forecast products that build upon and complement each other. Atmospheric, wave and inundation forecasts will be publicly available through the website and other platforms.</p> <p>NOAA's Pacific Regional Integrated Sciences and Assessments (RISA) programme at the East-West Center has identified climate impacts on human health and the prevalence of drought as key priorities for the Marshall Islands. RISA is currently working with the Marshall Islands Ministry of Health and Human Services on a NOAA-funded 2-year project to define the Ministry's climate services needs and to improve climate information delivery to the health sector.</p>	<p>NOAA is actively engaged with WSO and is an implementing partner in research and communication activities.</p> <p>UH's East-West Center is currently engaged in multiple projects to produce new climate-related products and services that stakeholders in RMI have requested.</p>
<p>Australian Bureau of Meteorology (BoM)</p>	<p>BoM is a long-term partner of Pacific meteorological services, in accordance with its responsibility as a developed country member of WMO.</p> <p>Australia has supported essential meteorological services in Pacific countries for many decades and more recently has contributed</p>	<p>BoM continues to deliver the Climate and Oceans Support Program in the Pacific (COSPPac), supporting the achievement of NMS's priorities for delivery of reliable and accessible climate information services.</p> <p>The Programme will coordinate regularly with</p>	<p>RMI's new climate services, ocean services and awareness officers will undertake training and attachments at BoM over the life of the Programme.</p> <p>BoM will deliver training in RMI on seasonal prediction using ACCESS-S software and on the use of information in preparing for the tropical cyclone season and for climate extremes such as droughts and floods. WSO staff will learn the use of ACCESS-S for seasonal forecasting for ocean conditions.</p>	<p>BoM is an implementing partner engaged in related activities with RMI in which WSO is the primary stakeholder.</p> <p>Australia is committed to assisting Pacific countries to adapt to climate change.</p>

	systematic support for NMSs as they have built capacity in the provision of local climate services.	BoM to ensure the coordination of activities. WSO is an active participant in BoM's programmes.	BoM will help WSO staff on attachment to prepare scientific material for publication and provide opportunities for them to present papers and posters at climate conferences. BoM will conduct workshops in partnership with WSO to build the scientific understanding of staff and their capacity to explain to their clients the application of climate monitoring and prediction products to their sectors.	
Stakeholder	Interest in the Programme	Influence on the Programme	Proposed role in the Programme	Engagement strategy
New Zealand National Institute for Water and Atmospheric Research (NIWA)	NIWA has a long relationship with Pacific NMSs and has expertise in providing and maintaining robust equipment suitable for tropical environments and limited local technical capacity.	NIWA has developed a range of tools for use in Pacific countries using CliDE data—the CliDE Client Services suite, or CliDEsc.	NIWA will contribute to training and technical support for installation, calibration and site inspections for new observation and monitoring equipment. Training will be delivered in RMI and at the NIWA Instrument Laboratory.	New Zealand is committed to assisting Pacific countries to adapt to climate change.
Private sector Ministry of Mineral Resources and Commerce Ivy Reimers-Roberto, Secretary, MMRC	RMI's private sector is concentrated in small commercial crop growers, subsistence agriculture and artisanal fishing (addressed through collaboration with sector agencies).	The private sector will be invited to contribute to the reiterative development of the National Framework for Climate Services in the second year of the Programme. The Programme will work with businesses to identify tailored climate information services that will build capacity to climate change and enable businesses to minimise the loss of assets to extreme climate events.	The private sector's principal role will be as a consumer of information services and representatives will be asked to work with the Programme and WSO to establish their information needs. These are expected to be in the areas of improved resilience of infrastructure and subsistence agriculture and fishing.	The Programme will publicise the benefits of using climate information to minimise the destructive impacts of climate change and extreme weather events on businesses.

Tuvalu

The consultants visited Funafuti 12–16 March 2019 and held meetings with the Tuvalu Meteorology Service (TMS) and their key national stakeholders (Table 1). Stakeholders were invited to share their knowledge and ideas and provide detailed input on potential interventions and activities for Tuvalu within the parameters of the approved Concept Note. The consultants met 17 representatives of multiple departments within Tuvalu Ministries and Offices including the Office of the Prime Minister; the Ministry of Foreign Affairs; the Departments of Agriculture, Climate Change and Disaster, Environment, Lands and Survey and Rural Development; the Gender Affairs Unit; the Media Department; and the Tuvalu Meteorological Service.

Table 13 shows the Stakeholder Engagement Schedule proposed by the Tuvalu Meteorology Services, **Table 14** lists the Representatives met in Funafuti and **Table 15** is the Stakeholder Table.

Table 13: Tuvalu Stakeholder Engagement Schedule

Dates	Stakeholders
Tuesday, March 12, 2019	12.30 pm: Arrival of PSS Team in Funafuti 2 pm: Briefing meeting with Director, Meteorological Service and Director, Department of Climate Change and Disaster (NDA)
Wednesday, March 13, 2019	9.00 am: Department of Lands and Survey 10.00 am: Department of Agriculture 12.00 pm: Tuvalu Meteorological Service 2.00 pm: Environment Office 3.00 pm: Department of Rural Development
Thursday, March 14, 2019	9.00 am: Tuvalu Media Department 11.00 pm: Gender Affairs Unit
Friday, March 15, 2019	1.00 to 6.00 pm: Tuvalu Meteorological Service
Saturday, March 16, 2019	9.00 am: Tuvalu Meteorological Service 12.30 pm: Departure of PSS from Funafuti

Table 14: Participants at Tuvalu Country Engagement

	Participant	Position
1	Mr Tauala Katea	Director, Meteorological Service
2	Ms Pepetua Latasi	Director, Department of Climate Change and Disaster
3	Mr Faatasi Malaloga	Director, Department of Lands and Survey
4	Mr Uatea Vave	Director, Department of Agriculture
5	Ms Melali Taape	General Manager, Tuvalu Media Department
6	Mr Mahu Tinapa	Director, Foreign Affairs, Tourism and Labour Department
7	Ms Lanuola Fasiai	Acting Director, Gender Affairs Unit
8	Mr Niko Iona	Manager, Climate, Meteorological Service
9	Mr Tavau Simeona	Manager, Forecasting, Meteorological Service
10	Mr Tinapa Faletute	Manager, Technical, Meteorological Service
11	Ms Yvette D'Unienville	News Editor/Manager, Tuvalu Media Department
12	Ms Ruby Alefaio	Production Manager, Tuvalu Media Department
13	Mr Elifaleti Ene	Senior Climate Officer, Meteorological Service
14	Ms Tilia Asau	Biodiversity Officer, Department of Environment
15	Mr Brian Ionatana	Strategic Planner, Department of Rural Development
16	Mr Putu Teaukai	Niutao Kaupule Planner, Department of Rural Development
17	Mr. Luka Selu	Relief and Recovery Officer, Department of Climate Change and Disaster

The consultants began their in-country consultations with a briefing meeting with Tauala Katea, Director of the Tuvalu Meteorological Service, and Pepetua Latasi, Director of the Department of Climate Change and Disaster, and the National Designated Authority (NDA) for GCF. This was followed by meetings with representatives and heads of departments proposed by the NDA. The consultants introduced the proposed Programme components, and the background to and objectives of the in-country stakeholder consultations. Sector representatives were invited to share their input on departmental and sector barriers to using climate information, and gaps in the information currently available.

Each meeting included in-depth discussion on the climate and ocean related sector-specific information products and services that the respondent and his or her agency would find useful. Respondents discussed potential interventions and tools that would build on past and current development initiatives so as to enhance the sustainability of inputs. The discussions explored ideas about national institutional arrangements that would improve the access, delivery and use of climate and ocean information and knowledge services by agencies and communities in Tuvalu.

Summary of key discussion issues

The need to build on / extend previous initiatives such as:

- Government of Germany-funded Development Bank KfW Cyclone Pam Recovery project—wave and sea level forecasting for the Tuvalu Meteorological Service in 2018;
- GCF-funded UNDP Tuvalu Coastal Adaptation Project—LiDAR surveys, topographical mapping;
- Japan International Cooperation Agency assistance—hazard-mapping in Funafuti;
- Pacific Regional Environment Programme (SPREP) support—Traditional Knowledge Project;
- The Pacific Community (SPC)—National Geodetic Surveys: MSL datums, portable tide gauges for five outer islands, tide calendars, more climate training for Department of Agriculture;
- National Adaptation Programmes of Action, NAPA II Projects—Chatty Beetle for early warning system, signboards with ENSO Watch Dial, drills under each Island Disaster Plans, compass poles in outer islands;
- The Finnish-Pacific Project (FINPAC) training for media / Glossary for Climate and Weather terms; and
- Climate and Ocean Support Program for the Pacific (COSPPac)—trainings on use of seasonal climate forecasting tool, SCOPIC.

The need to simplify and contextualise climate and weather terminology to enhance understanding / awareness of sector agencies and outer island communities:

- Implement more training and awareness programmes on climate and weather terminology to enhance understanding of the Department of Agriculture Extension Officers and communities in the outer islands;
- Develop a climate information and training package translated to Tuvaluan language and context for communities;
- Continuously support communities to raise their climate and weather awareness and required actions before and during disasters;
- Establish a Climate Communications person within TMS to connect regularly with NAPA officers in outer islands;
- Develop further a Glossary of Climate and Weather terminologies for the media;

- Improve clarity in climate and weather announcements made to outer communities, to enable better understanding by recipients of information, usually women;
- Build capacity of women on climate and weather terminologies and on climate awareness and preparations for disasters; and
- Articulate weather and climate information in language that is clear and relevant to women, who are usually at home and the first to receive climate and weather information and guidance on preparatory actions.

The need to establish a more effective means of communicating climate and weather information for disaster announcements, via radio or television:

- Enhance communication to communities;
- Support communities in outer islands with TV sets, free-to-air television, and local Tuvaluan programs that would enable a wider reach to vulnerable groups such as deaf people, and encourage communities to use this as a regular medium of critical communications—a once-a-month climate awareness programme was suggested to complement Tuvalu Radio communications. An established and regularly used channel of communication would facilitate timely and effective updates from and to outer islands before and during disasters;
- Support communities to access Tuvalu Radio via HF Radio reception;
- Support for restoration of the satellite TV signal to Tuvalu;
- Install Compass boards, poles and signboards for disaster warnings within communities;
- Address establishment of Meteorological Service officers in outer islands;
- Support drills instigated under Island Disaster Plans; and
- Support funding of National Climate Outlook Forums.

Discussions with the Tuvalu Meteorological Service elicited the following priorities:

- Support to enable digitisation of sector data, especially for Health, Agriculture, and Fisheries Departments, including development of a key data entry template so the departments can begin systematic collection of their own data in a format compatible with the NMS's CliDE data management system. This will allow datasets to be overlaid, and the effects of climate on other sectors to be analysed;
- Support for Chatty Beetles, HF Radio, Signboards, Compass Boards for an Early Warning System (EWS);
- Support to host an annual National Climate Outlook Forum (NCOF);
- Support for equipment to enable more accurate readings of wind speed and gusts in addition to establishing new Met Stations in outer islands, and to procure equipment e.g. HF, Barometer, Thermometer;
- Support for enhancement of capacities and skills of Met Service staff;

- Enhance coral bleaching monitoring through establishment of pH level measurement;
- Support for additional personnel, e.g. IT Officer, Climate Data Analyst, Data Entry Officer, Assistant Forecaster/Observers for new Met Stations; and
- Support to update the Climate and Weather Glossary and to gather and document Traditional Knowledge.

There was also interest from the Department of Climate Change and Disaster, and the Department of Agriculture (to inform agricultural crop planning) on work currently undertaken by the Australian Commonwealth Scientific and Industrial Research Organisation (CSIRO) on climate change risk assessments and, particularly for agriculture, on the FAO toolkit for agriculture assessment that was introduced after Tropical Cyclone Pam in 2015.

On completion of the fieldwork, the consultants drafted an outline programme of activities based on their discussions with stakeholders and confirmed it in principle with the NDA and the TMS before leaving Tuvalu.

Table 15: Tuvalu Stakeholder Table

Stakeholder	Interest in the Programme	Influence on the Programme	Proposed role in the Programme	Engagement strategy
All Ministries and Government Departments	The Government of Tuvalu is a primary beneficiary of all Programme interventions: the Programme's objective is to facilitate the flow of climate information that government agencies will use to increase Tuvalu's resilience to climate change impacts.	<p>The support of senior ministry officials will be essential to the success of the National Framework for Climate Services. They must be able to see tangible benefits for their departments from mainstreaming climate information into their policies and planning functions.</p> <p>The support of all ministry staff will be essential to the implementation of the NFCS. The mainstreaming of climate information into their work must address their own priorities for</p>	<p>The active engagement of government staff will be critical to the following activities:</p> <ul style="list-style-type: none"> • Working with the national Programme Manager, TMS and consultants to understand how climate considerations can be mainstreamed into the work of their agencies; • Using good quality science and evidence-based information on long-term climate change in planning infrastructure and other development investments and avoiding maladaptation; • Identifying a suite of directly applicable information products relevant to their work; • Participating in a consultative workshop to develop and refine a National Framework for Climate Services; 	<p>Engagement ensured through:</p> <ul style="list-style-type: none"> • Workshopping the design of the National Framework for Climate Services with TMS and a facilitator; • Technical support and staff training provided to sector focal representatives on climate science, community consultation techniques, etc; and • Opportunities to deliver targeted face-to-face advice to island communities on the implications of climate change in their sector.

		improving their services to communities.	<ul style="list-style-type: none"> • Agreeing a process for checking the utility of information products regularly and revising them when needed; and • Proactively raising obstacles to mainstreaming with the Programme team throughout the term of the Programme. 	
Funafuti and outer island communities Kaupule on each island, women's groups	Communities are one of the ultimate beneficiaries of all Programme interventions: the Programme's objective is to facilitate the flow of climate information that communities will use to increase their resilience to climate change impacts.	<p>All Tuvalu's communities are affected by long term climate change impacts—sea level rise causes erosion and salting of arable land, ocean acidification degrades the surrounding reefs and their productive ecosystems, average temperatures are rising, and rainfall patterns are more erratic.</p> <p>Outer island communities are also at severe and frequent risk from extreme events, particularly the effects of nearby cyclones and of prolonged droughts. The risk is greatly exacerbated by communication difficulties, lack of local data and the high cost and slowness of transport options—both warnings and responses are often delayed, resulting in great hardship and loss of assets and livelihoods.</p>	<p>Behavioural change is a key measure of the Programme's success: implementing agencies will need the active engagement of communities in making technical information useful to them so that they:</p> <ul style="list-style-type: none"> • Prepare effectively for forecast extreme events; • Advise authorities of approaching water stress in time to prevent hardship; • Manage water resources in accordance with advice on probable rainfall; and • Plan planting schedules and crop varieties on the basis of rainfall advice, etc. <p>Outer island communities have allocated commonly owned land for construction of basic weather stations. A community member will be trained in accurate observation and recording of climate data, as each new station is completed.</p> <p>The local observations officer on each island will maintain a community billboard posting advice from TMS for food gardeners and artisanal fishers, and early warning information when needed.</p> <p>TMS will seek the input of island communities to refining the outlook for their island, such as establishing practical</p>	<p>Communities are already aware that forecasting capability is improved by local observations and have requested weather stations on each island.</p> <p>Advice will be delivered in Tuvaluan and will benefit from ongoing work with each community on a glossary of climate and weather terms in Tuvaluan.</p> <p>Community representatives will attend the annual National Climate Outlook Forum in Funafuti each November and share advice and recommendations on their return home.</p> <p>TMS officers will visit each island in a circuit 2 or 3 times per year to deliver a climate and oceans workshop, explain the current rainfall outlook and reinforce advice from the Outlook Forum.</p> <p>TMS will explain the use of the outlook in informing subsistence growers' decision making (with input from the agriculture ministry).</p>

			<p>indicators of approaching water shortages in plenty of time for action: management of stored water, planting short-season crops, early harvest of crops, arranging for potable water to be shipped, etc.</p> <p>Communities will be engaged in confirming, revising or developing disaster preparation and response plans during TMS's regular visits.</p>	<p>If high temperatures are predicted, the outlook may include advice on temporary prohibitions on collecting resources from coral reefs, advice on ciguatera indicators, etc.</p> <p>Communities will be engaged in testing and practising the disaster drills they have developed.</p> <p>The benefits of science-informed behaviour change will be communicated widely through Programme reporting.</p>
NGOs, civil society, church groups, island disaster committees	<p>Civil society organisations will benefit from opportunities to expand work they already do with communities and to extend the range of their activities, building on lessons learnt from pilot projects.</p> <p>The Programme's gender focus will expand opportunities for women to influence communications and to use information products.</p>	<p>Church groups are very influential in Tuvalu and will be invited to participate in the ongoing development of the National Framework for Climate Information Services in the third year of the Programme, and in the design of community activities.</p> <p>The Red Cross is a trusted organisation with long experience in working closely with communities and with each island's disaster committee, to prepare for and respond to disasters.</p>	<p>Civil society representatives will be members of the National Coordination Team (NCT) that will coordinate community consultation meetings and the implementation of the CB-EWS and DRR plans.</p> <p>They will support the engagement of island communities with Programme activities.</p>	<p>Civil society organisations will lead awareness raising campaigns with the support of the Programme; receive training in professional standard community consultation techniques to ensure women, youngsters, people with disabilities are able to participate fully in consultation; advise Programme implementing agencies on effective communication with their communities.</p>

Stakeholder	Interest in the Programme	Influence on the Programme	Proposed role in the Programme	Engagement strategy
<p>Tuvalu Meteorological Service</p> <p>Mr Tauala Katea, Director, TMS</p> <p>Mr Nico Iona, Manager, Climate Services, TMS</p>	<p>TMS is the principal implementing agency for the Programme. The Programme Implementation Unit team will be located in the TMS office. The team will report to the National Advisory Council on Climate Change.</p> <p>TMS will benefit from the expansion of its data observation network and from Programme support in extending the range of tailored advice it can offer to clients.</p>	<p>TMS's active engagement will be essential to the success of the Programme.</p> <p>TMS is committed to using the Programme to strengthen its provision of information services so that climate information is mainstreamed into the work of government agencies and into science-informed adaptation by communities.</p>	<p>The Programme will enable TMS to extend its observation network to Tuvalu's outer islands and territorial waters, improving the accuracy of its climate forecasting.</p> <p>Additional officers for climate and ocean information services will enable TMS to expand their range of services and to generate tailored products for key sectors.</p> <p>Modern communication equipment will enable TMS to provide much more reliable information, warnings and advice to remote communities and to receive data from all islands.</p> <p>TMS will be responsible for the maintenance of additional equipment, with the support of regional partners.</p>	<p>Ongoing capacity development and support from the Programme and from regional partners will raise TMS's profile, make the work of its staff more interesting, enable staff to see positive impacts from their work and enable them to influence government policy on a critical development issue.</p> <p>The Programme will enable staff to undertake hands-on work with all communities including outer islands in areas TMS has identified as very high priorities in successive planning documents.</p>
<p>Department of Climate Change and Disaster Management / NDMO</p> <p>Ms Pepetua Latasi, Director DCCD</p> <p>Mr Luka Selu, Relief and Recovery Officer, DCCD</p>	<p>DCCD is a key agency in any activity reducing climate change risks and impacts and its staff will be important partners in the Programme.</p> <p>The National Advisory Council on Climate Change is chaired by the Secretary to the Government and sits within the Department of Climate Change and Disaster Management and be a key advocate for</p>	<p>DCCD's engagement will be essential to the success of the National Framework for Climate Services.</p> <p>TMS will also work with DCCD as it finalises the draft Tuvalu Meteorology Act, to ensure agreement among agencies on their roles in early warning systems and disaster management.</p>	<p>DCCD will partner with TMS in activities relating to disaster preparation, warning, management and response. Structured, funded and supported collaboration between the two agencies will strengthen both, and improve the usefulness of advice they provide to communities.</p> <p>The Programme Implementation Unit will report to the National Advisory Council on Climate Change.</p>	<p>DCCD will benefit from training on effective community consultation. Staff will be invited to accompany TMS staff on regular visits to outer islands particularly when disaster awareness materials are being co-designed with communities, climate and weather terms are being determined, the climate outlook is being explained, drought indicators are being worked out, communication methods trialled, and any other activities where DCCD's input will be valuable.</p>

	the Programme within Government.			
<p>Tuvalu Media Department</p> <p>Ms Melali Taape, General Manager, Tuvalu Media Department</p> <p>Ms Ruby Alefaio, Production Manager, TMD</p> <p>Ms Yvette D'Unienville, Production Editor / Manager, TMD</p>	<p>The Media Department is a key agency in EWS and in communicating routine climate information throughout Tuvalu.</p> <p>Its advice to TMS on how to make technical information more understandable will be critical to ensuring steady improvement of the presentation and delivery of information in accessible formats through public media.</p>	<p>TMD will be an important contributor to the National Framework for Climate Services (NFCS) facilitated workshop in the first year of the program.</p> <p>TMD has already contributed to work on a Tuvaluan glossary of climate and weather terms and will help with further work. It has undertaken to introduce the use of Tuvaluan words in weather and climate broadcasts so that they become understood, accepted and commonly used.</p>	<p>One function of the NFCS will be to agree on protocols for communication of warnings and advice before and during extreme events.</p> <p>The national Programme Manager will monitor the progress of this collaboration to ensure agreed systems are fit for purpose.</p> <p>Throughout the term of the Programme, TMD will work with other Programme partners to improve the accessibility of climate and weather information.</p>	<p>The Programme will provide climate information materials such as videos explaining climate processes (Climate Crab, etc.) developed by regional partners.</p> <p>New resource materials for radio and television developed by SPREP, SPC, CSIRO and the other Programme countries will be shared.</p> <p>Tuvalu expects to have free-to-air TV by 2020 and the Programme will source climate related materials and help to arrange translation.</p> <p>TMD may be invited to travel to outer islands to take part in community consultations on how to present information in the most useful way.</p>
<p>Department of Agriculture / Dept. of Rural Development</p> <p>Mr Uatea Vave, Director, DoA</p> <p>Brian Ionatana, Strategic Planner, DRD</p>	<p>DRD will be an important partner in work with communities on applying climate information to farming.</p>	<p>DRD will be invited to contribute to the National Framework for Climate Services facilitated workshop in the first year of the program.</p> <p>Its advice to TMD on useful information products will be an essential step in helping farmers and gardeners to use climate advice and adapt their practices to conditions.</p>	<p>DRD will work with TMS's climate officer to adapt climate information such as seasonal rainfall predictions to the needs of subsistence growers.</p>	<p>TMS's regular visits to all islands will give DRD extra opportunities to travel with them for agricultural extension work.</p> <p>Encouraging farmers and gardeners to adapt their practices to actual conditions is a long-term undertaking and the more often DRD staff can discuss the benefits of adaptation on-site, the more likely behaviour is to change. Regular visits will support subsistence growers in</p>

				trying crop selection to match expected rainfall through the growing season, for instance.
Health Ministry	Seasonal forecast information and information on predictable long term changes have potential to help the Ministry of Health to manage disease risks and climate related ill-health more effectively. Early prediction of drought can reduce the impacts of severe shortages of water for drinking and washing. It may be possible to forecast the risk of dengue and other vector-borne disease outbreaks.	MoH will be invited to contribute to the initial draft of the National Framework for Climate Services, in a facilitated workshop in the first year of the program. MoH staff will be asked to explain what kinds of information would be useful to them to reduce avoidable ill-health, disease outbreaks and injuries from extreme events.	MoH's main role in the Program will be as users of information. Its staff will be regularly consulted about the continuing usefulness of information products.	MoH officers may be invited to accompany TMS on visits to outer islands to explain the implications of seasonal forecasts for community health.
Stakeholder	Interest in the Programme	Influence on the Programme	Proposed role in the Programme	Engagement strategy
Pacific Regional Environment Programme (SPREP)	The Manager of the Programme's multi-country hub will be located on the SPREP campus, but independent of SPREP. SPREP hosts the Pacific Meteorological Council and the Pacific Climate Change Centre and is an important source of support to Pacific Meteorological Services who are principal partners in the Programme. WMO's	SPREP has particular strengths and experience in community engagement and in technical support. SPREP's PacMetDesk manages a monthly teleconference with Pacific NMSs including Tuvalu, in which TMS checks its current seasonal forecast, generated from local data using SCOPIC. The seasonal forecast is the foundation for TMS's	SPREP will continue its ongoing support to TMS, contributing to a support base shared among all Pacific NMSs. This includes: <ul style="list-style-type: none"> • Providing the annual Regional Climate Outlook Forum before each cyclone season (Oct/Nov) and helping NMSs prepare their National Climate Outlook Forum; • Maintaining CliDE—through the Programme, SPREP will help TMS develop a key entry form so that MoH, Fisheries and DoA can enter and store 	The Programme will enable SPREP to build on existing work with TMS in areas identified as high priorities by both organisations. SPREP is a longstanding partner with Pacific NMSs with broad experience in technical support, ecosystem management and working with communities. SPREP will be closely engaged throughout the term of the Programme, as it provides capacity development to TMS

	<p>Pacific representative is also located in Apia, Samoa.</p> <p>Many of SPREP's own activities will complement the Programme and the Programme will build on successful past pilot projects.</p> <p>SPREP's Inform Project will contribute to TMS's strengthened data management.</p>	<p>advice on probable rainfall for the 3 to 9 months ahead. SPREP's support is essential to TMS's provision of the advice of most interest to Tuvalu's farmers, water managers, disaster managers and health authorities.</p> <p>SPREP maintains the code of the climate data management system (CliDE) used by all Pacific NMSs.</p>	<p>their data in CliDE, for use in conjunction with climate data;</p> <ul style="list-style-type: none"> • Maintaining SCOPIC to ensure TMS's seasonal forecasts are accurate; • Continuing the Online Climate Outlook Forum to maintain TMS's Climate Officer's confidence in generating and explaining the monthly seasonal forecasts; • Developing new data products using TMS's CliDE data; • Providing lessons from previous community awareness projects and practical adaptation projects in Tuvalu and with other atoll countries; • Developing training modules in meteorology and climatology for TMS staff; • Sourcing specialised advice within SPREP's other divisions to support the Programme's work with sector clients; and • Hosting Tuvalu's climate data in its Inform database. <p>SPREP will lead a workshop in Tuvalu to develop community-based response plans for extreme weather / climate events. This will include a strong gender focus.</p> <p>The workshop will draw on traditional climate knowledge (TK) collected and recorded by TMS with the support of SPREP through the Australian Climate and Oceans Support Program (COSPPac).</p> <p>SPREP will continue the documentation of TK, install Tuvalu's TK database at the TMS</p>	<p>through assistance with workshops, provision of training and development of new tools.</p>
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			and work with TMS on the use of TK in its work with communities.	
The Pacific Community (SPC)	SPC will make a major contribution to the addition of oceanographic services to TMS's capabilities. The extension of observation capacity to Tuvalu's ocean areas will also benefit SPC's climate monitoring and analysis capacity.	SPC will contribute procurement expertise to the Programme ensuring purchases of modern observing equipment represent value for money and will assist TMS with training in use and maintenance, with ongoing technical support. SPC will ensure that its related work complements Programme activities.	SPC will continue its ongoing support to TMS, contributing to a support base shared among all Pacific NMSs. This includes: <ul style="list-style-type: none"> • Providing regional oceanographic services, and extending and down-scaling the services through the Programme; and • Supporting TMS as it begins to build capacity in ocean information services, through training and attachments. SPC maintains and provides access to the Pacific Ocean Portal originally developed by BoM through COSPPac: the Portal allows a user with limited internet access to select a location and a sector such as tourism, fisheries, and shipping, ask for ocean parameters such as sea temperature, wave heights, coral bleaching, currents, salinity and chlorophyll, and receive the information visualised as maps and diagrams.	Training and attachments for TMS's staff and especially the new climate services and ocean services officers will ensure collaboration and identification of synergies.
Australian Bureau of Meteorology (BoM)	BoM is a long-term partner of Pacific meteorological services, in accordance with its responsibility as a developed country member of WMO. Australia has supported essential meteorological services in Pacific countries for many decades and more recently has contributed systematic support for	BoM continues to deliver the Climate and Oceans Support Program in the Pacific (COSPPac), supporting the achievement of NMS's priorities for delivery of reliable and accessible climate information services. The Programme will coordinate regularly with BoM to ensure the coordination of activities.	Tuvalu's new climate services and ocean services officers will undertake training and attachments at BoM over the life of the Programme. BoM will deliver training in Tuvalu on seasonal prediction using ACCESS-S software and on the use of information in preparing for the tropical cyclone season and for climate extremes such as droughts and floods. TMS staff will learn the use of ACCESS-S for seasonal forecasting for ocean conditions. BoM will help TMS staff on attachment to prepare scientific material for publication and	BoM is an implementing partner engaged in related activities with Tuvalu in which TMS is the primary stakeholder. Australia is committed to assisting Pacific countries to adapt to climate change.

	NMSs as they have built capacity in the provision of local climate services.		<p>provide opportunities for them to present papers and posters at climate conferences.</p> <p>BoM will conduct workshops in partnership with TMS to build the scientific understanding of staff and their capacity to explain to their clients the application of climate monitoring and prediction products to their sectors</p> <p>As an addition to the long-running Sea Level Monitoring Project (1991—) BoM will install and manage a temporary tide gauge at Niulakita. Niulakita's tides are significantly distant from those at the permanent tide gauge at Funafuti and the additional data will be passed to SPC for development of a local tide calendar.</p>	
Stakeholder	Interest in the Programme	Influence on the Programme	Proposed role in the Programme	Engagement strategy
New Zealand National Institute for Water and Atmospheric Research (NIWA)	NIWA has a long relationship with Pacific NMSs and particularly the Polynesian countries such as Tuvalu. New Zealand funded the maintenance of essential observing equipment in neighbouring countries for many years and has expertise in providing and maintaining robust equipment suitable for tropical environments and limited local technical capacity.	NIWA has developed a range of tools for use in Pacific countries using CliDE data—the CliDE Client Services suite, or CliDEsc.	<p>NIWA will contribute to training and technical support for installation, calibration and site inspections for new observation and monitoring equipment.</p> <p>Training will be delivered in Tuvalu and at the NIWA Instrument Laboratory.</p>	New Zealand is committed to assisting Pacific countries to adapt to climate change.
Tuvalu's private sector	Tuvalu's private sector is small and most formal employment is in	The private sector will be invited to contribute to the reiterative development of	The private sector's principal role will be as a consumer of information services and representatives will be asked to work with	The Programme will publicise the benefits of using climate information to minimise the

	government agencies. The private sector is concentrated in small commercial crop growers, informal agriculture and artisanal fishing and tourism.	the National Framework for Climate Services in the second year of the Programme. TMS will work with businesses to identify tailored climate information services that will build capacity to climate change and enable businesses to minimise the loss of assets to extreme climate events.	the Programme and TMS to establish their information needs.	destructive impacts of climate change and extreme weather events on businesses.
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Validation workshop

In May 2019, the Directors of the five partner countries' meteorological services took part in a workshop in Rarotonga to assess the draft Programme prepared with each country. The workshop took advantage of the attendance of the NMS Directors and of key development partners at the annual planning meeting for the Australian Government's Climate and Oceans Support Program, after which the five Directors stayed a further three days (Tuvalu Meteorological Service was represented very proficiently by its Climate Officer).

Representatives of the Australian Bureau of Meteorology, New Zealand's National Institute for Water and Atmospheric Research, the US National Oceanic and Atmospheric Administration, the Pacific Community's Geoscience, Energy and Maritime Division and the Pacific Regional Environment Programme gave presentations on services they could offer to the Programme —procurement and installation of equipment, training in operation and maintenance, ongoing technical support and work with communities on effective communication and the use of traditional climate knowledge.

The five NMHS Directors, the Cook Islands NDA and UNEP together agreed on a budgeted Programme of activities with each country that will enable them to build their institutional, human resources and infrastructural capacities to provide high quality, well-understood climate services to their governments and populations. The Programme will address national priorities as interlocking components of a functioning system.

The Feasibility Study explains the logic of the activities and the contribution of the Programme to the five countries' achievement of strengthened resilience to climate change impacts.

Each country has indicated its ownership of the Programme by providing a No Objection Letter and committing to contribute co-financing and resources to its implementation. In July 2019, UNEP gave a presentation on the agreed Programme at the Fifth Pacific Meteorological Council

Meeting to all PMC members, who strongly endorsed it. Country NMHS Directors also referenced and supported the Programme during their national presentations.

Stakeholder Engagement Activity Timetable

This table suggests a schedule for engaging formally with the principal stakeholders in the Programme over its five year term. It lists the formal interactions built into the Programme with key partners in the public and private sectors and with communities across the five countries and proposes the frequency and timing of those engagements where possible. This structure will be confirmed or modified by the Samoa-based PMU, the National Designated Authority and the national Programme Implementation Unit during the inception phase in consultation with the Steering Committee if necessary.

Detailed timetables with identified stakeholders will also be agreed for each country during the inception phase, and the means of recording and reporting on the outcomes of these interactions, to ensure their usefulness in managing activities and assessing their impacts.

Table 16: Stakeholder Engagement Activity Timetable

Stakeholder	Engagement purpose	Engagement technique	Engagement frequency	Date(s) and location	Activity owner	Activity progress
Partner countries (NDAs) and UNEP, observers (regional partners)	Consultation, provision of strategic direction for Programme	Steering Committee meetings	At least annually	After PMC meetings every second year in Samoa, after COSPPac or other meetings in alternate years.	UNEP / PMU	
NDA, national government and community representatives	Provision of strategic direction and policy guidance, monitoring and review of progress Ensure cooperation among agencies / communities with Programme activities	National Coordination Committee Meetings	Quarterly		NDA / National EE	

National Government agencies	Sharing of information, knowledge and lessons learned	National Climate Outlook Forum—presentation	Annual, from Year 1	October / November (Cook Islands, Niue, Tuvalu) April / May (Palau and RMI) – hired venue	National Meteorological Service (NMHS) / Weather Service Office (WSO)	
	Consultation, establishment of base-lines	Workshop to design the National Framework for Climate Services	Year 1	Immediately after NCOF	Hired consultant / facilitator, national EEs	
	Collaboration	Workshop to fine-tune the National Framework for Climate Services			National EE / NMS / WSO	
	Workshops / liaison	Inter-ministry coordination	Quarterly	Government ministries	National EE	
	Sharing of information and knowledge	Sector-specific climate training with climate sensitive ministries	Annual		NHMSs	
	Sharing of information, knowledge and lessons learned	Briefing for officials attending international meetings	As required		NMHSs / WSOs / National EEs	
	Collaboration	Inform project meetings	Monthly	Government ministries	Inform project National Coordinator	
	Sharing of information and knowledge	Briefing for Parliamentary Ministers on the	Annual		NMHS / National EEs	

		climate outlook and use of its data to inform climate-resilient planning (Niue)				
	Collaboration	Conduct vulnerability assessments for the development of disaster risk reduction products with EMCI (Cook Islands)	Year 1	Outer islands	CIMS / National EE	
	Evaluation	Facilitated workshop to evaluate the progress and impact of integration of climate information into government agencies' policies and functions through the NFCS	Year 5		Evaluation consultant	
Private sector	Sharing of information, knowledge and lessons learned	National Climate Outlook Forum—presentation	Annual	October / November (Cook Islands, Niue, Tuvalu) April / May (Palau and RMI) - hired venue	National Meteorological Service / Weather Service Office	
	Consultation	Workshop to design the National	Year 2	Immediately after NCOF	Hired consultant / facilitator	

		Framework for Climate Services				
	Collaboration	Workshop to fine-tune the National Framework for Climate Services	Year 3		NMHSs / WSOs / National EEs	
	Evaluation	Facilitated workshop to evaluate the uptake of climate information by the private sector	Year 5			
NGOs, community groups and representatives	Sharing of information, knowledge and lessons learned	National Climate Outlook Forum—presentation	Annual	October / November (Cook Islands, Niue, Tuvalu) April / May (Palau and RMI) - hired venue	National Meteorological Service / Weather Service Office	
	Consultation	Workshop to design the National Framework for Climate Services	Year 3 (NGOs) Year 4 (Community representatives)	Immediately after NCOF	Hired consultant / facilitator	
	Collaboration	Workshop to fine-tune the National Framework for Climate Services	Year 4			
	Collaboration	Co-design of community-based sustainable development plans	Year 1 / 2	In communities / villages / islands	NMHSs / WSOs / National EEs/ National Disaster Management Authorities	

		for climate resilience				
	Collaboration	Develop communication styles to make climate information understandable, develop local language climate terms	Years 2, 3 and 4	In communities / villages / islands	NMHSs / WSOs / public media / National EEs	
	Consultation	Engage with community elders to integrate traditional climate knowledge (TK) with meteorological science	Years 2 – 5	In communities / villages / islands	Local TK consultants	
	Collaboration	Conduct disaster drills	At least annually	In communities / villages / islands	NMHSs / WSOs / National EEs/National Disaster Management Authorities	
	Evaluation	Facilitated workshop to evaluate the uptake of climate information by the community sector	Year 5			