FINPAC

Reduced Vulnerability of the Pacific Island Country Villagers' Livelihoods to the Effects of Climate Change

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PROJECT DOCUMENT

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by
Secretariat for the Pacific Regional Environmental Programme (SPREP)
with
Finnish Meteorological Institute (FMI)

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PROJECT FACT SHEET

Project Title	FINPAC Reduced vulnerability of the Pacific Island Country villagers' livelihoods to the effects of Climate Change
Project Number	MFA Intervention Code:
Sector Focus	Climate Change, Poverty Reduction, Disaster Risk Reduction, Weather and Climate Services, Early Warning Services, Community Response
Geographical Coverage and Project Site	Pacific Islands Countries (Cook Islands, Federated States of Micronesia, Fiji, Kiribati, Marshall Islands, Nauru, Niue, Palau, Papua New Guinea, Samoa, Solomon Islands, Tonga, Tuvalu and Vanuatu) Project Office in Apia, Samoa at SPREP Offices.
Duration	Four years, 2012 - 2015
Starting Date	TBC
Project Financing	Project funding through MFA: 3 775 346,5 € SPREP in-kind Financing: 55 000 €
Intended Beneficiaries	National Meteorological and Hydrological Services (NMHSs) of the Pacific Island Countries (PICs)
Project Purpose	Improved capacity of the Pacific Island Country National Meteorological and Hydrological Services to deliver weather, climate and early warning services in cooperation with and for the benefit of villagers in Pacific communities
Overall Project Objective	Reducing vulnerability of the Pacific Island Countries' livelihoods to the effects of Climate Change
Institutional Framework	Regional Cooperation Project implemented through SPREP
Competent Authorities	Secretariat of the Pacific Regional Environmental Programme (SPREP), Finnish Meteorological Institute (FMI)

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Acronyms

ABoM	Australian Bureau of Meteorology
CROP	Council of Regional Organizations of the Pacific
CSIRO	Commonwealth Scientific and Industrial Research Organization (Australia)
FMI	Finnish Meteorological Institute
FINPAC	Finnish-Pacific Project
FMS	Fiji Meteorological Service
GFCS	Global Framework for Climate Services
GTS	Global Telecommunication System
HYCOS	Hydrological Cycle Observing System
ICAO	International Civil Aviation Organization
ICT	Information Communications Technology
ICSHMO	International Conference on Southern Hemisphere Meteorology and Oceanography.
JNAP	Joint National Adaptation Plan
NAPA	National Adaptation Plan of Action
NDMO	National Disaster Management Office
NMS	National Meteorological Service
NMHSs	National Meteorological and Hydrological Service (For Finland: FMI)
NOAA	National Oceanographic and Atmospheric Administration (USA)
NWS	National Weather Service (USA)
Météo-France	French national meteorological service
MFA	Ministry for Foreign Affairs of Finland
NIWA	National Institute for Water and Atmospheric Research (New Zealand)
NZ MetService	New Zealand national meteorological service (private)
PCCR	Pacific Climate Change Roundtable
PICs	Pacific Island Countries, represents here the independent and free association island countries of Cook Islands, Federated States of Micronesia, Fiji, Kiribati, Marshall Islands, Nauru, Niue, Palau, Papua New Guinea, Samoa, Solomon Islands, Tonga, Tuvalu and Vanuatu
PICTs	Pacific Island Countries and Territories, represents the above list of PICs and includes additionally the territories of American Samoa (USA), French Polynesia (France), Guam (USA), New Caledonia (France), and Tokelau (New Zealand)
PIFFACC	Pacific Islands Framework for Action on Climate Change
PIFS	Pacific Islands Forum Secretariat (CROP agency leading on political and economic issues)
PI-GCOS	Pacific Islands Global Climate Observing System
PI-GOOS	Pacific Islands Global Ocean Observing System
PIMS 2012 – 2021	Pacific Islands Meteorological Strategy 2012-2021
PMC	Pacific Meteorological Council
PMDP	Pacific Meteorological Desk Partnership
RA V	Regional Association V (Roman five South-west Pacific) of the WMO
RBSN	Regional Basic Synoptic Network
RMSC	Regional Specialized Meteorological Centre
RMSD	Regional Meteorological Service Directors' Meeting
SDMP 2000-2009	Strategic Action Plan for the Development of Meteorology 2000 - 2009
SOPAC	Geoscience Division of the SPC (formerly the Secretariat of the Pacific Geoscience Commission, an independent CROP agency now merged with the SPC since 2009)
SPC	Secretariat of the Pacific Community
SPREP	Secretariat of the Pacific Regional Environmental Programme
QMS	Quality Management System
UN	United Nations
WMO	World Meteorological Organization

1. Summary

The FINPAC Project is a regionally coordinated project targeting the most pressing needs of Pacific Islands' communities in the coming years: adapting to the effects of Climate Change. The overall objective of the Project is:

> *Reduced vulnerability of the Pacific Island Country villagers' livelihoods to the effects of Climate Change*

The adaptation approach developed in the Project is based on the development of capacity of the National Meteorological Services[1] (NMSs) to respond to the growing needs of communities to prepare and respond to the changing weather patterns and climate trends by using improved services. The FINPAC Project (also referred to here as 'the Project') will partner NMSs with Non-Governmental Organizations (NGOs) to work with communities and villages from participating Pacific Island Countries (PICs) and their NMSs to develop early warning systems and improved dialogue between disaster managers and NMSs and with end users of weather and climate information for the benefit of the life of all people living in PICs. A particular focus will be on those living in rural communities and villages.

Communities in Samoa[2] pointed out that although communities at the village or grass root levels received weather forecasts and warnings over the radio, these are not necessary linked to their needs i.e. to plan their activities and responses for a week or a month. It is their view that they still require some 'tailor made products and services' to match the needs and levels of appreciation by grassroots users. This is to 'align or retrofit meteorological information for specific purposes' at the community level. For example, as planting and harvesting of certain crops are determined by daily and monthly average temperatures and rainfall, the Samoa community prefers weather forecasts to include this information along with implications for planting, harvesting or fishing. The Project will fill this gap and to ensure that communities' priorities are met in line with the objectives of the Project.

The Project design incorporates inclusive measures to ensure that cross cutting issues such as gender equality and most vulnerable groups are considered and catered for in terms of activities. For example, gender equality issues are found to have direct relevance for improving Pacific NMSs environments, particularly poverty alleviation. The FINPAC Project will contribute strongly to poverty reduction through greater food and water security, improvements in weather and climate services, and early warnings to the most vulnerable groups in the Pacific region. The Project will perform a thorough baseline study during its initial inception phase to ensure that community needs with regard to NMSs are identified at a stage early enough to feed into Project activities.

[1] The Pacific Meteorological Council has adopted the convention of using the name **National Meteorological Service** to identify the meteorological and hydrological services provider in member countries. This represents a small point of difference with WMO who uses the term **National Meteorological and Hydrological Service** for the same purpose.

[2] A community survey was carried out in Samoa in 2011 to establish the level of understanding, access, and usage of weather and climate services relative to livelihood activities.

While the Project will be a major development effort focused on Pacific weather and climate services, it is envisioned that partnerships at all levels will be critical to the successful implementation of the Project's goals and objectives. SPREP's Pacific Meteorological Desk Partnership (PMDP) will provide many of the partnerships at the technical and resource levels with agencies working currently with Pacific NMSs. At the national level, the Project will strengthen partnership between NMSs and villages; this partnership is critical for the Project's output and outcomes sustainability. It is the NMSs that will continue to provide meteorological data and information to match the users' (both at the national and community levels) information for development needs.

Through these partnerships and close consultations, planning and sharing of information of the Project amongst the identified key stakeholders the Project will be assured of both regional and national level support. It should be noted that this Project development has had the view, consultation, and support of the Pacific Meteorological Council, the governance body on weather and climate services development in the Pacific region (made up of Directors of Pacific NMSs), and WMO.

2. Background

The Pacific region is characterized by islands and archipelagos sharing a common thread of evolutionary and human history. Mostly isolated from one another by vast areas of ocean, the peoples of the Pacific have developed unique cultures and attitudes of self-reliance. Many countries occupy extremely small habitable land areas and are dependent on weather-sensitive activities for their social and economic survival.

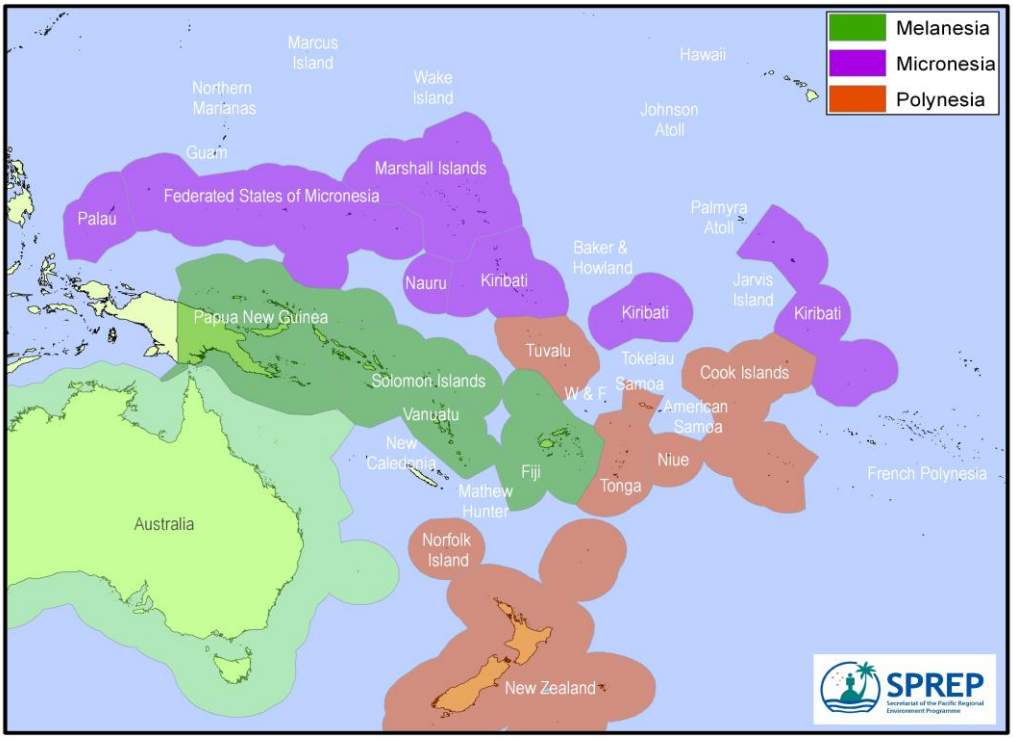


Figure 1: *The Pacific Island Country territories. Source: SPREP*

Additionally, Pacific island countries (PICs) are geographically widely dispersed, face many similar development challenges and have limited human and financial capacity. Many PICs are multi-island jurisdictions and two are single island countries. They have a large range of socioeconomic conditions; for example, Solomon Islands is a low income LDC economy with a GDP of less than USD$995 per capita, many have lower-middle-income economies with GDP per Capita of USD$996- $5,500 (Kiribati, Marshall Islands, Federated States of Micronesia, Papua New Guinea, Nauru, Samoa, Tonga, Tuvalu, Vanuatu) and three have upper-middle-income economies with GDP per capita of $5,500 to $12,195 (Fiji, Cook Islands, Palau)[3]. PICs share many development challenges due to their remoteness and in turn distance to major economic centres and size of the economies. They have limited financial and human resources to deliver public goods and services, particularly for outer islands in the multi-island jurisdictions, but strong family and community/village-based systems still exist that are critically important in many PICs.

Most PICs economies are small, and narrowly focused and thus vulnerable to external shocks (such as fossil fuel and imported food prices and natural hazards) and largely reliant on local market and subsistence agriculture, fisheries and other use of natural resources to maintain livelihoods; tourism is a growing industry for some of the larger islands. Many PICs are also reliant on remittances provided mainly from family connections in neighbouring developed countries (e.g. New Zealand, Australia). Significant development assistance flows into the region to help address many of developmental, social and economic needs.

PICs are subject to a range of natural hazards including earthquakes, volcanic eruptions, local and distant tsunamis, landslides, flash floods and storm surges, droughts and frequent tropical cyclones. The El Nino Southern Oscillation (ENSO) heavily influences the climate of the region.

Added to this, is the fact that PICs are identified amongst the most vulnerable to the adverse impacts of climate change, and as such, need to build their adaptive capacity to address such impacts. The Global Adaptation Institute publishes a Global Adaptation Index (GAIN, http://gain.globalai.org/) that summarizes a country's vulnerability to Climate Change and its readiness to improve resilience. In the GaIn, the PICs are situated at the bottom of the ranking while Australia is #4, New Zealand #5 and Finland #6 out of all the 161 countries in the ranking. Highest-ranking PIC is Samoa at #99 and lowest Papua New Guinea at #144. For Tuvalu, Solomon Islands, Palau, Nauru, Marshall Islands, Kiribati and Federated States of Micronesia there is no score due to missing information. For vulnerability, all PICs are at the bottom third of the world's countries.

The large majority of the Pacific countries are signatory to significant international Multilateral Environmental Agreements, and have strong political commitments made on action on climate change. Climate change impacts from rising sea levels pose risks to coastal areas where for the majority of islands infrastructure and populations are located. Often, agricultural areas particularly on atoll islands are affected by salt-water intrusion making growing of staple root crops difficult causing some food security risks in turn. Water resources are similarly affected by higher than normal king and spring tides reducing potable water for human consumption. Added to this, many atoll nations are solely dependent upon rainwater for their daily water needs, and are increasingly being subject to fluctuations in supply due to increased frequency of drought conditions for some countries.

[3] GDP per capita data from http://data.worldbank.org/about/country-classifications/country-and-lending-groups#East_Asia_and_Pacific and http://unstats.un.org/unsd/demographic/products/socind/inc-eco.htm

Countries have identified these present day challenges to climate variability as being exacerbated in the future due to climate change.

While progress has been made in development of climate change adaptation, many of these efforts have been based on studies of existing vulnerabilities and past extreme events of weather and climate. There have been efforts in recent years in improving the capacity PICTs to cope with CC impacts utilizing a scientific approach in the use of climate Projection modeling, trends analysis of weather and climate data

Appropriate and strengthened meteorological and climatological services applied to sensible planning have the potential to greatly minimize and alleviate many of these adversities. At the same time, these would help to clear obstacles to economic growth and contribute to the sustainable development, reduction of poverty, and contribute to better living standard and self-reliance of these countries.

2.1 Needs

2.1.1 Needs of Communities

SPREP undertook a survey of local grassroots communities (Annex 17), including reviewing inputs from community and grassroots surveys undertaken by local NMSs. The survey was undertaken to gain a qualitative measure of the level of understanding, access, and usage of weather and climate services relative to livelihood activities.

It was found that NMSs products and services, despite having media access to grassroots communities, still require some tailor made products and services to match the needs and levels of appreciation by grassroots users. These products could include for example, a re-packaging of meteorological information useful for long line pelagic fishermen who may be out at sea for long periods. Products could also include long term rainfall and temperature predictions for farmers to support their planning for planting of harvesting of crops. A calendar for farmers activities matched to the observed and projected climate variables could also be another related project. In general, basic services that have been delivered over the past decades have good use in daily planning and execution of subsistence activities. Feedback also indicated that improved weather and climate services would help improve both short and long planning and adjustments to these activities so as to reduce economic costs due to unforeseen extreme events.

Community interactions at the grassroots level are often complex and intertwined with individual or family priorities in Pacific Island countries (this includes typifying gender roles also). In times of disasters or weather and climate extremes, it is found that in general the support of the community tends to become the central focus of information gathering and dissemination, hence a strong opportunity exists for the supporting of weather and climate information services to this level for wider access and use in advance of natural disasters such as tropical cyclones and other extreme events.

However, in spite of the recent sophistication of weather and climate services able to be provided by Pacific NMSs, there is potentially an increasing gap between the presumed understanding required for the use of new products and services, and the level of appreciation of weather and climate services that have been routinely delivered by Pacific

NMSs. It is found also that media outlets of AM/FM radio, television, and newspaper, are still the core sources of access to weather and climate information, and that potential development via other sectors such as education are bringing new media such as the internet into play. The latter opportunity is identified in village schools, women's committees, where establishing internet enabled computers and other ICT tools such as smartphone could potentially increase the reach of weather and climate services for Pacific NMSs, and access for these community based end users.

It is strongly identified then for this Project, that several opportunities exist to strengthen the delivery and use of weather and climate services from Pacific NMSs to communities and at the grassroots level. Activities identified thus center around building the capacity and level of understanding of grassroots/community on weather and climate in general and the capacity of NMS to deliver the products and services required by communities for decision making. Additionally, it is identified from the survey that weather and climate products and services could be further refined for specific target audiences for grassroots audiences, and made friendlier for media outlets to deliver (e.g. climate services are not particularly radio friendly). Communities had also identified a range of small activities also that could assist in the greater dissemination of weather and climate services and products, and these require the Project through Pacific NMSs to work closely with development sectors at the national level to employ their opportunities for greater grassroots/community access to new media such as the internet. These activities are:

- Grassroots awareness and capacity for villages to apply weather and climate services in livelihoods planning
- NMSs and media outreach programme on improving weather and climate services and products
- NMSs working with and building partnerships with rural development sectors and communities to reduce communities weather and climate vulnerabilities
- NMSs identifying opportunities to deliver weather and climate services through options that could be sustained (i.e. community centres using internet, radio and newspaper media).

On top of this are the needs of the adaptation community. Increasingly, NMSs are being asked to provide climate information to a wide range of policy makers who are developing programmes to adapt to the adverse impacts of climate change. NMSs are finding it hard to keep up with these demands, and as such may need additional resources, training or capacity support. At the same time, the adaptation community could do with similar capacity building, to better understand the climate forecasts produced by their respective NMSs.

This community survey was carried out to find the needs of the communities, however, this survey and consultation are to be replicated and extended to other communities that will participate in the Project in close consultation with NMSs. Additional surveys will not only identify community needs and priorities but will also establish useful baselines against which to measure project impact. Surveys will also raise the profile of the Project and be used to better communicate Project outcomes.

2.1.2 National Needs

For NMSs in the region to adequately cope with the growing demands expected of them, they need to modernize their services, restore and upgrade infrastructure (equipment and facilities), acquire new technology, and improve and develop their human resources (see Annex 22 for summary on NMSs priority issues and needs collated from a recent meeting of the Pacific Meteorological Council).

SPREP's PMDP and the PMC have produced a regional development strategy for weather and climate services titled "Pacific Islands Meteorological Strategy 2012-2021 – Sustaining Weather and Climate Services in Pacific Island Countries and Territories" (see Annex 3). Under this effort, a formally updated needs assessment of individual NMSs needs and priorities is included.

While strengthening of individual NMSs is essential and should be carried out as far as possible within the resources available, it is often constrained by limited funding and staff to meet on-going operational needs and the capacity to absorb advanced technology. While staff with high order of technological skills are a requirement, these people are scarce and in individual services are often unlikely to be used to full capacity, resulting in dissatisfaction and often migration to larger organizations elsewhere.

The Strategic Action Plan for the development of meteorology in the Pacific region 2000-2009 (see Annex 18) outlines needs related to observing systems, telecommunications, infrastructure, climate, disaster management and capacity building. In discussions with the NMSs and the SPREP, the need to increase the level of expertise of the staff of NMSs is seen as a major challenge and will also be the scope of this Project plan.

A small number of staff is required to carry out a variety of duties, requiring individual officers to have a wide range of skills. This is compounded by the difficulty of obtaining appropriately qualified recruits, making transfer of knowledge and skills in an area of rapidly advancing technology difficult. The maintenance and development of a variety of knowledge and skills ranging from management at various levels, professional meteorology, engineering, technical maintenance, product delivery and presentation skills, weather observation skills, and computer skills are essential to deliver useful end products effectively and efficiently.

This Project is responding to the needs rising from the developing status of many NMSs as national authorities and the increasing demand from the public to deliver weather services as identified to SPREP and WMO Secretariats in RMSD and RA V meetings (Annexes 21 and 22). Many NMSs have been detached from colonial support in the past 20 years and need both financial and human resources to continue as independent services. This Project seeks to help bring together resources into a strategic program to benefit the region and to address two distinct needs that most PIC NMSs share: implementation of a Quality Management System for aviation weather services in accordance with ICAO requirements and raising the status of meteorology within the country through increased communications with the public and media and strategic planning.

2.1.3 International Needs

This Project also responds to PICs obligations and commitments made under international frameworks such as the Hyogo Framework for Action, the United Nations Framework Convention on Climate Change (UNFCCC), and through international organizations such as the WMO, in particular the Regional Association for the Southwest Pacific (RA V) Regional Action Plan (Annex 6). Obligations and commitments under these frameworks are addressed through Project implementation and capacity building at the national level. Needs, concerns and recommendations arising from the Project will also be channeled through PICs climate change negotiators to these international processes, so as to inform of best practices developed, needs and concerns analysis, and other information, with a view to securing further international support to assist the implementation of the regional strategy and national meteorological services strengthening. The Project also presents opportunities to communicate to the FCCC adaptation processes the manner in which climate change science and meteorology will be utilized to strengthen community awareness and capacity building and ultimately inform adaptation implementation in the Pacific.

In meeting international reporting and activities requirements under climate change and disaster risk management many PICs have endeavoured to include in mention of the need and value of weather and climate services. In the past two years, SPREP and the Geoscience Division of SPC (formerly SOPAC) have worked with some PICs to combine both national adaptation plans (climate change) and NIP (disaster management) national strategy documents to reflect the synergies of priority goals and actions and to avoid duplication of efforts. The emergent document called Joint National Action Plans (JNAP) with participating countries currently all have mention and inclusion of weather and climate services as part of their core strategy.

2.2 The Role of a National Meteorological Service (NMSs)

The NMSs is a fundamental component of the national infrastructure of all countries. In each Pacific Island Country the NMSs is responsible for forecasting, warnings, related daily and long term information management which underpins national safety (in terms of aviation, shipping and early warning), security and general well-being of their citizens (in terms of livelihoods (fishing and agriculture) and daily development activities.

Almost all Pacific Island Countries (PIC) have NMSs. These services collect meteorological data that is used primarily for forecast and warning services but are also the basic data for climate monitoring. Their climatological services have made progress from being generally poorly developed or non-existent, to an increasingly important counterpart role to weather services. In a small number of instances where there are countries without NMSs, these rely mainly on external support to provide basic weather and climate services.

In general, the meteorological services in the region are small by world standards with limited resources, budgets and staff. They are easily overwhelmed by the need to respond to a number of policy issues and operational requirements ranging from tropical cyclones, climate variability, climate monitoring, climate change, provision of routine weather information including forecasts, and meeting the needs of industry such as aviation. In recent years, their mainstream inclusion into climate change, disaster and risk

management efforts at national level, have led to greater opportunities to improve their general standing and involvement in the context of national development strategies. Again, however, these opportunities have not necessarily resulted for most NMSs in receiving greater support to those budgetary and human resources challenges.

The capabilities of NMSs in the region range from relatively advanced infrastructure and good capabilities in several areas of service provision to those with poor infrastructure and limited capabilities. Recent moves by most Pacific island governments towards self-reliance have involved diversifying their economies into areas which are extremely weather and climate dependent such as forestry, fishing, water resources, industries, transportation and tourism. These initiatives have increased the demands on NMSs at a time when resources available to them are decreasing.

Although SPREP's entry point to the country is through the NMSs and the Government Focal Point, it is recognized in line with the overall objective of FINPAC that NMSs partnerships with community groups is critical for the success of this project. This partnership provides the pathway where meteorological information and required capacity building will channel to the community and vice versa, ensuring that community needs and capacity requirements will reach the NMSs.

The capacity of users and communities to use and apply meteorological information for planning is based on a strong partnership between NMSs and communities. This partnership should guide NMSs services to the communities to:

- identify the preferred medium for NMSs to deliver and communicate data and information to communities and to the outer islands
- build the capacity of communities to understand meteorological information and apply this understanding to livelihoods activities, including planning, execution and monitoring
- develop with the community their disaster risk reduction plan to maximize the use of resources and expertise at the community level
- conduct awareness programme on early warning systems and elaborate what communities are expected to do at each level of warning linked to the community disaster risk reduction plan

2.3 Climate Change and Disaster Risk Reduction in the Pacific region

Pacific island countries remain highly disaster prone with all of them threatened by a variety of natural hazards of geological and meteorological origin including earthquakes, volcanic eruptions, tsunamis, cyclones, river and coastal flooding (including permanent coastal inundation due to sea level rise), landslides, and droughts. In the past decade social, including health and pollution hazards, and civil unrest have also increased as a result of population increase, urban drift, uneven wealth distribution and political pressures. Tropical cyclones and other extreme events (floods, droughts, extreme temperatures) are the most frequent cause of disasters in the region, but geological hazards and other anthropogenic hazards (fire, chemical spills or infrastructure collapse) have the potential to cause greater losses as recent tsunamis and inter-island ferry disasters have demonstrated.

Examples of some of the most recent major events occurred in April 2007 when a magnitude 8 earthquake and tsunami occurred in the western Solomon Islands costing the country an estimated US$90 million equivalent to 90% of the year's operating budget; in January 2009 flooding in western Viti Levu, Fiji, families and small businesses in sample areas in Nadi and Ba alone lost an estimated US$160 million (7% GDP); and in September 2009, the magnitude 8 earthquake and tsunami in American Samoa, Samoa and Tonga, a result of which the Samoa Government estimated the losses at US$104 million (more than 5% GDP); and in January 2010 when a magnitude 7.2 earthquake and tsunami occurred again in the western Solomon Islands for which costs are still to be assessed. All except the latest event included loss of lives.

It is important to stress that natural hazards by themselves do not cause disasters. It is the combination of an exposed, vulnerable and ill-prepared population with a hazard event that results in a disaster. Climate change increases disaster risks in two ways. First, climate change will likely increase the frequency and/or severity of weather and climate hazards. Second, climate change through slow onset processes will simultaneously increase communities' vulnerability to natural hazards due to the combined effects of ecosystem degradation, reduced availability of water for ecosystems and agriculture, and changes in peoples' livelihoods.

Clearly, Disaster Risk Reduction (DRR) and Climate Change Adaptation (CCA) share common goals: reducing the vulnerability of communities and achieving sustainable development. A key common link between DRR and CCA is the need to provide early warning systems that are effective, integrated and people-focused and that are able to communicate information that is understood over vast ocean distances both within and between countries and to generally isolated populations.

This is where the output and outcome of the Project are crucial and could play an important role. Timely dissemination of weather and climate information together with increased understanding of how to apply them in development/livelihoods planning could lead to timely preparedness, response and adaptation in the long term.

The response from the Pacific has been guided by the Pacific Islands Framework for Action on Climate Change (PIFACC) and the Pacific Framework for Action on Disaster Risk Management. Additionally, for the past several years including 2010, Pacific Leaders in the Forum Communiqué have continued to highlight that climate change (including climate variability, extreme weather events and sea-level rise) remains the greatest threat to the livelihoods, security and well-being of the peoples of the Pacific. Events in the Pacific in recent years have highlighted that PICTs are increasingly vulnerable to the impacts of climate change and natural disasters.

Tonga, Republic of the Marshall Islands, Tuvalu, Cook Islands and Niue have all completed national joint action plan on climate change adaptation and disaster risk management (JNAP). These joint national action plans identified community level adaptations and disaster risk management priorities including that of the outer islands. The role of accessing and understanding meteorological information underpins climate change adaption and disaster risk reduction at the community level. This was also underlined in the Samoa community survey which played a critical role in addressing the needs of the communities.

Similar community needs are identified in the Samoa, Vanuatu, Solomon Island and Papua New Guinea National Disaster Plans. These plans are at the national level only. The

FINPAC is the key initiative what will link these national plans with community plans and also empower communities to implement their plans. The NMSs also has a critical role here in linking the national plans to the community level plans.

2.4 SPREP

The Secretariat of the Pacific Regional Environment Programme (SPREP), based in Apia, the capital of the independent state of Samoa, is a regional inter-governmental organization established by the governments and administrations of the Pacific region to look after its environment and issues related to sustainable development. It currently has some 70 staff in Apia.

The vision of SPREP is “That people of the Pacific islands are better able to plan, protect, manage and use their environment for sustainable development.”

The mandate of SPREP is “To promote cooperation in the Pacific islands region and to provide assistance in order to protect and improve the environment and to ensure sustainable development for present and future generations.”

The guiding principles of SPREP are to ensure that all its members have:

- Strengthened their capacity to respond to climate change through policy improvement, implementation of practical adaptation measures, enhancing ecosystem resilience to the impacts of climate change, and implementing initiatives aimed at achieving low-carbon development;
- Improved their sustainable management of island and ocean ecosystems and biodiversity, in support of communities, livelihoods, and national sustainable development objectives, through an improved understanding of ecosystem-based management and implementation of National Biodiversity Strategic Action Plans.;
- National waste management and pollution control policies, strategies, plans, and practices in place for minimization of terrestrial, atmospheric, and marine pollution, hazardous waste, solid waste, and other land-based sources of pollution.;
- the capacity to develop and implement transparent and robust frameworks and processes for improved environmental governance, planning, monitoring and reporting, and the Secretariat will be producing periodic regional State of the Environment assessments..

To support and implement these four strategic priorities, five cross-cutting areas or implementation pillars will continue to be interlinked across SPREP’s technical programmes. These five pillars are:

- implementation of Multilateral Environmental Agreements (MEAs);
- capacity building;
- partnerships;
- knowledge management; and
- communication and awareness.

SPREP’s new structure (recently approved by the 2011 SPREP meeting) has 4 delivery divisions, Biodiversity and Ecosystem Management, Climate Change, Pollution and Waste

Management and Environmental Monitoring and Governance. The Climate Change Division will be responsible for the management of FINPAC.

SPREP's operations, programmes and activities are funded in three ways:

- SPREP's core operations are funded primarily through assessed contributions received from its members;
- SPREP's key programmes are funded mainly on a voluntary basis from a variety of sources;
- Specific Projects are supported from donations from a number of sources, including member governments, for example GEF, UNDP, EU, etc.

In response to a mandate from NMSs, SPREP developed a strategic action plan which aims to

- Provide the framework for setting short, medium and long term priorities for meteorological services in the region;
- Ensure these priorities are based on identified and agreed needs of NMSs;
- Raise the profile and the importance of the work of NMSs;
- Promote the cooperation and coordination of all relevant developmental assistance agencies.

This mandate from the NMSs makes SPREP the most important regional agency addressing the needs of the Pacific region's meteorological services and provides a firm foundation for regional development Projects. Hence, this Project falls well within the objectives of SPREP and its objectives.

- SPREP has an objective to find ways to support the strategic development of the region which this Project addresses
- The need to raise the profile and the importance of the work of NMSs has been raised by SPREP and the NMSs and this Project will address this need by raising the capacity of the Services to identify end user needs and communicate effectively
- The need to conform to the demand of quality managed aviation weather services is urgent in many NMSs. This Project aims to build the capacity of the services to implement the necessary processes for the quality management system.

This project will also be implemented and coordinated by SPREP's Pacific Meteorological Desk Partnership (PMDP), within the Policy and Science sub-programme of the Climate Change Division. Further information on the PMDP is provided below, in section 2.6.

2.5 Previous Phases

This Project document follows work done in two previous Projects. First, the WMO-funded feasibility study on the development of regional meteorological services in the Pacific prepared by the FMI and presented for funding to the MFA in 2006. This stand-alone study included mainly travel and meetings with stakeholders in the Pacific with the purpose of attracting funding for regional activities.

Second, a MFA funded ICI Project titled "FPPICS - Finnish-Pacific Project for Increased Capacity of SPREP and PIC NMSs Staff to Meet the Growing Demand for Meteorological and Climatological Information in the Society" implemented jointly by the FMI and SPREP

from 1 June 2009 to 31 December 2011 with a Project budget of 500,000 Euros has included capacity building activities in the region in especially aviation weather quality management systems (QMS) and strategy development.

The FPPICS project had two Key Result Areas, namely:

1. Improved PIC NMSs capacity to provide aviation weather services according to international requirements for Quality Management Systems (QMS) and strengthened SPREP capacity to support NMSs to implement QMS
2. Strengthened needs based customer service capacity of the PIC NMSs for weather and climate services and enhanced strategic planning abilities of SPREP to support the PIC NMSs

The current document carries on some activities from the FPPICS Project and a range of new interventions. The understanding of the needs and limitations of the Pacific region has been greatly developed during the FPPICS Project. The QMS training will continue from the FPPICS Project with the same FMI experts as key experts. Knowledge gained during the FPPICS Project has to a great extent enabled the development of this Project concept and the FINPAC Project Document could have not been developed without it.

In 2009, the PIC NMSs faced a major challenge to comply with the ICAO requirement to provide aviation weather services under certified quality management systems. The FPPICs project was successful in building the capacity of the NMSs to a level where 90% of them are now using quality management systems in observation and forecasting services for aviation purposes. QMS implementation has reportedly led to major improvements in the availability and quality of the information provided to the aviation authorities. QMS implementation has given NMSs an increased self-confidence, structure and customer orientation to their operations. This will and already has resulted in more and better observations and improvements to forecasts, warnings and ultimately safety in the PICs[4].

Under Result 2, the focus was on the communication and engagement with end users and stakeholders for both NMSs and SPREP. Major progress was achieved in improving the role of SPREP as the regional organization for meteorology and climate. New projects were developed and submitted, new partnerships formed and regional mechanisms implemented. The excellent strategic thrust and work environment of SPREP have contributed to the success of this result.

Some key remaining challenges that will be picked up the FINPAC in partnership with FINPAC- FMI will include the following:

- Expand training for QMS and establish a roving regional trainer's team.
- Collect socio-economic data in line with the FINPAC planned national and community based activities

[4] Based on the FPPICS Completion Report 2011.

2.6 Key Strategies and Policies

The key regional strategies and policies related to this Project are included as Annexes to this Project document and include, but are not limited to:

- Pacific Islands Meteorological Strategy 2012-2021 (Annex 3)
- 2010 SPREP Review of Weather and Climate Services in the Pacific (Annex 4)
- WMO Regional Association V Strategic Operating Plan 2012-2015 (Annex 6)
- SPREP Strategic Plan 2011-2015 (Annex 5)
- PACC Project Document 2008-2012 (Annex 13)
- Pacific Disaster Risk Reduction and Disaster Risk Management 2005-2015 (Annex 19)
- Pacific Islands Framework for Action on Climate Change (PIFACC) (Annex 20)
- The Pacific Meteorological Council
- The Pacific Meteorological Desk Partnership

The Project supports donor coordination by supporting the FINPAC Project management with FMI expertise and engaging with other major donor countries on behalf of the MFA. This will be done through the Pacific Meteorological Desk Partnership (PMDP) and the Pacific Meteorological Council (PMC). All of the activities presented here have been coordinated The PMDP is a multi-donor/multi-partner approach for a SPREP consolidated support to NMS.

Based on Regional Meteorological Review the PMDP approach was recommended to strengthen SPREP's capacity and the approach was approved by the SPREP meeting (2010) and PMC (2011). The 'Desk' is an enhanced framework for the support given by SPREP to the NMSs within is Climate Change Division. The FINPAC Project supports this new initiative fully and includes funding for one full-time Project officer at SPREP.

The Pacific Meteorology Council is the formalized former Regional Meteorological Service Director's Meeting (RMSD)[5] with Terms of Reference and reporting to the SPREP Meeting each year. The PMC represents the NMSs in the region and meets every two years to address the development of weather and climate services in the region.

SPREP also acts at the Secretariat for the Pacific Climate Change Roundtable (PCCR), which acts as the regional coordination mechanism for all activities related to climate change. SPREP provides support also to the four working groups of the PCCR, the two most relevant to this Project being the PCCR Adaptation Working Group, and PCCR Knowledge Management Working Group.

2.7 Linkages to Relevant Regional and Global Frameworks

All PICs are acceded to the United Nationals Framework Convention on Climate Change (UNFCCC) and other key global conventions as a result of the UNCED 1992. This project will directly enable Pacific Island Countries to better meet their requirements under the UNFCCC. In particular, it will meet their requirements under Article 5 of the UNFCCC to strengthen the capacity of their research and systematic observation systems.

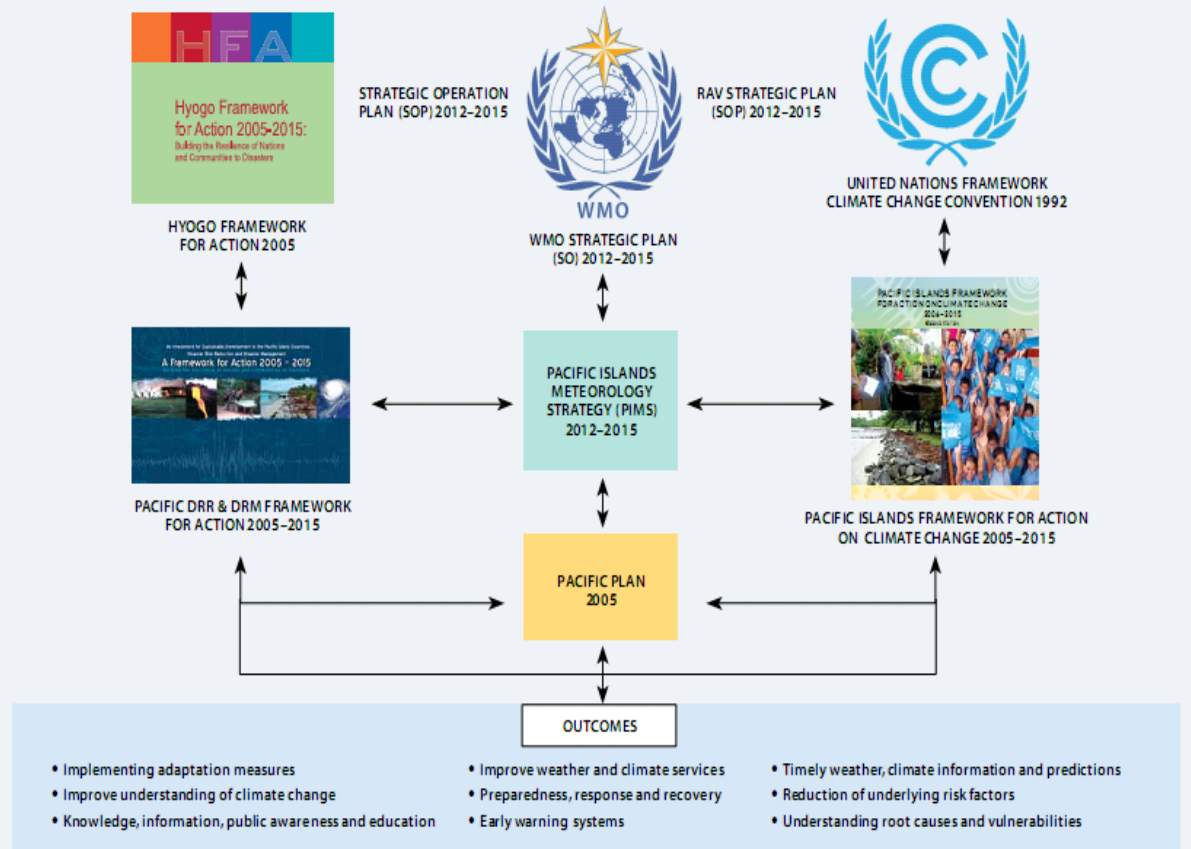
It will also assist countries to meet their national reporting requirements under Article 12 (i.e. National Communications) as it will allow them to have more accurate forecasts/predictions needed for more accurate vulnerability and impacts assessments -

[5] RMSD no longer exists.

leading to stronger national responses to dealing with the impacts of climate change. By having better climate information available to them, it will also strengthen their ability to develop national adaptation plans (NAPs), as recently mandated under the Cancun agreements in COP 16. Similarly, PICs have also endorsed the Hyogo Framework of Action.

The Pacific has since developed two regional frameworks to guide regional implementation of the Hyogo Framework and the UNFCCC reflecting regional priorities. These regional frameworks are the PIFACC and the DRM Framework for Action (refer figure 2). In the same context the Pacific Meteorological Strategy currently under development under the umbrella of the WMO RA V has close linkages with PIFACC and DRM framework for action as know only contributing to global agreements but their key purposes are to highlight unique regional and national priorities.

The FINPAC project will be nested within the Pacific Meteorology Strategy with its outputs contributing directly to the progression of the PIFACC as well as the DRM regional frameworks. This will ensure that the FINPAC project and its activities in-country and at the regional level is cohesive with the current needs and priorities of the PICs and the region.



2.8 Finnish Value Added

Finland is a small, technically oriented country in Northern Europe with high living standards and excellent education and social welfare systems. For the most part of the 21st century Finland has been known for its high-tech brands and investments into education

and high level of its workforce. Finland is also very environmentally conscious and committed to combatting the implications of Climate Change.

Weather and Climate are vital components of the Finnish way of life. The weather can be life-threatening in winter under temperatures of -50°C and long distances make transportation via land, sea and air very dependent on accurate weather information. This combined with the high-tech inclination has resulted in a world-class accumulation of public and private organizations with a weather and climate focus into Finland. The Finnish Meteorological Institute (FMI) is among the most advanced weather services in the world with a key partnership with the University of Helsinki (UH) atmospheric research department

Weather and Climate services in the development context are a Finnish core competency with very little matching expertise available elsewhere. The cooperation between FMI and SPREP has proven effective and a clear need for the continuing support from the Government of Finland has been expressed by all of the PIC NMSs. This Project is unique in many ways, it has an unique approach that addresses the entire value chain of Early Warning Services, it has a clear development focus and technical assistance combined, the gender, HIV/AIDS and poverty reduction issues have been taken into the Project activities and it addresses the most pressing need of the PICs: climate change adaptation.

The FMI is the National Meteorological Service of Finland under the Ministry of Transport and Communications of the republic of Finland. The key expertise of the FMI from observation networks, numerical atmospheric modeling, commercial services, applications of meteorology (automated productions systems), public awareness (FMI's website is the fifth well-known and used web resource in Finland), international cooperation (FMI has been involved in a number of projects in over 80 countries) all the way to administration (best place to work in the public sector 2007, quality management systems, efficient processes).

FMI is a world-class expert in the subject areas of this project. IN the Pacific, the FMI has carried out a socio-economic study in the region, assisted the PIC NMSs to implement a quality management system for aviation weather services, and held a workshop on communication strategies. For this Project, the FMI will draw from its pioneering work on MeteoAlarm, SmartMet and observation network operations.

This project will draw on the skills of the FMI in

- Project management
- Quality Management Systems
- User needs analysis for commercial and public weather services and products
- Weather and Climate observation network maintenance and upgrade
- MeteoAlarm development work for the EUMETNET
- SmartMet automatic weather production suite development and maintenance
- International capacity building and training projects
- Accounting and administration

In addition to the internationally recognised expertise of the FMI, Finland also has excellent knowledge on meteorological equipment technology.

2.9 Other Development Partners

Within the Pacific region the most active financiers are Australia, France, Japan, New Zealand and the US. In some countries the meteorological services fully depend on the support from these countries (American Samoa, New Caledonia, Guam, etc.) while some countries are self-sufficient but receive occasional development aid mainly from one of the countries mentioned above.

With respect to climate change Projects and programs active in the region, SPREP manages approximately USD$25m through two regional Projects on climate change adaptation and mitigation. This combined total represents approximately 15% of total funding active for climate change activities in the Pacific region. International donor and implementing agencies in the region supporting these programs include the World Bank, the Global Environment Facility (GEF), United Nations Development Program (UNDP), and United Nations Environment Program (UNEP), as well as bilaterally funded programs by Pacific Rim countries such as Australia, New Zealand, USA, and Japan. These Projects and programs have some interaction with Pacific NMSs but provide little by way of direct funding for NMSs specific activities.

Of the more general regional meteorological programs, Météo-France delivers an annual meteorological workshop in a specified subject area (marine forecasting, aviation forecasting, tropical cyclones) for all PIC NMSs, Australia hosts 5-10 students from the PIC NMSs in its forecaster courses in the Bureau of Meteorology Training Centre, NOAA offers training for northern Pacific islands in its Hawaii forecast office and also observation data from its weather observation network and Japan has donated some weather observation equipment to some NMSs. The US also funds the full-time Pacific Islands Global Climate Observing System (PI-GCOS) officer for SPREP (ceasing in late 2011, but to be continued under new donor funds). These regional meteorological programs are currently being reorganized by SPREP and the various partner technical organizations involved improving upon the overall coordination to affect more efficient planning, delivery, and use of existing resources between the partner technical organizations.

3. Stakeholders

The direct beneficiaries of this Project are the PIC NMSs, represented through the Pacific Meteorology Council (PMC). The Project has been fully endorsed by the PMC in its first meeting on 12 August 2011 in Majuro, Marshall Islands to support the needs of NMSs. The NMSs will receive a comprehensive update of the Project in their bi-annual meeting in 2013 and 2015. Members of the PMC are also included as part of the project Steering Committee.

The ultimate beneficiaries are groups that have special needs for accurate weather forecasts like aviation services, farmers, tourism industry and fisheries and governments that receive improved information for decision making. The needs of the ultimate beneficiaries are described in the FINPAC Project document and its annexes. An important challenge in this Project is the inclusion of grassroots users to be involved in the FINPAC Project decision making. While the feedback from community based Project efforts of FINPAC will provide some indicators for success of the Project, SPREP will endeavor in planning community Projects to consult closely with community based leaders as well as

those national agencies with community development programs active in such communities. Representative leaders of communities already active in association with such national agencies will be asked to actively participate in the planning and execution of national level Project activities and asked to provide decision making feedback on Project plans not just for community targeted activities but also those dealing with NMSs development, and NMSs and end-user engagement.

This Project will focus on the independent and free association Pacific island countries of Cook Islands, Federated States of Micronesia, Fiji, Kiribati, Marshall Islands, Nauru, Niue, Palau, Papua New Guinea, Samoa, Solomon Islands, Tonga, Tuvalu and Vanuatu will be financially covered within the Project budget to attend the activities. The Project will be free for attendance with additional resources from any Pacific or cooperating country.

4. Objectives and Indicators

4.1 Overall Objective

The Overall Objective describes the long-term development goal where the Project is contributing. The FINPAC Project Overall Objective is:

Reduced vulnerability of the Pacific Island Country villagers' livelihoods to the effects of Climate Change

The FINPAC Project will be unique in its approach, coverage, focus and linkages across its suite of activities linked from NMSs at the national level to users at the community levels and collaborating with regional and national NGOs. The Project will provide NMSs with the capacity and tools and accurately provide weather and climate services in a timely manner to support community[6] adaptation planning and disaster risk reduction. Equally, the capacity of the community will be strengthened to use and apply meteorological data and information.

Improved understanding of weather and climate services will improve the general decision making of grassroots communities and policy makers during the life of the Project, but it will provide a forward momentum for the continual and sustained long term improvement of weather and climate services in all participating PICs in addressing dynamic needs of people and sectors adapting to climate change and reducing the risks of extreme events.

Its uniqueness in the existing environment of multitude climate change adaptation and disaster resilience building efforts in the region is in its primary focus on the National Meteorological Services as the core agent for the improvement of weather and climate services and as the link to the community development. While many of other existing regional climate change adaptation Projects in the region focus on specific sectors such as water resource management, food security, coastal infrastructure protection, building

[6] Community as used in this project include vulnerable sectors and groups at the community level. These groups will be considered according to gender roles and needs as well as age (children and old people).

codes, the FINPAC Project understands the need to strengthen the core information and services upon which those sector rely; without understanding meteorological and climatological implications of future climate variability and change, decisions made solely on the impacts of extreme events will lack information and long-term foresight into the avoidance or mitigation of such events repeating.

The staged or phased approach take into considerations the current capacity including absorption capacity and other national activities that NMSs and communities are responsible for or involved in thus ensuring that this project also fits into their national action programs to allow for maximum participation and uptake including in-corporation into their annual business plans.

The FINPAC Project will work with stakeholders (national and community levels) involved in sectors such as food security, and health to understand how weather and climate services can better inform and add value to works already underway to improve upon these in the region. In doing so, the Project endeavours to integrate the role of National Meteorological Services within national development efforts such that their contributions are recognized as adding great value, and provides valid avenue to term their effective contribution from a technical standpoint of weather and climate services delivery, into those of core national development concern.

The measureable indicators for the overall objective are:

- Communities and villagers believe that their vulnerability to climate change has been reduced during the project lifetime
- Communities and villagers feel that their communities are safer with regard to weather and climate related hazards following the project activities
- Communities and villagers are able to better address weather and climate threats to fishing and agricultural practices

The success will be verified through the following Sources of Verification:

- Baseline study
- Project's products developed and disseminated
- Endline study
- Regular project monitoring and evaluation reports
- Impact assessment report from villages
- Village-level Disaster Risk Reduction strategies

There are however many logical activities that the Project is intended to do in order to achieve the outcomes. The above high level outcome indicators are unpacked into outputs indicators under each key result areas. The NMSs and communities as beneficiaries need to understand the root causes of their vulnerability, the kind of information, skills and capacity they need to build their resilience, as well as where and who is providing the information.

4.2 Purpose of this Project

The purpose of this Project is the:

Improved capacity of the Pacific Island Country National Meteorological and Hydrological Services to deliver weather, climate and early warning services in cooperation with and for the benefit of villagers in Pacific communities

Several aspects of the Project are focused on technical capacity development and technological enhancements assisting national meteorological services. As mentioned in section 4.1 while the overall objective is the reduced vulnerability of PIC livelihoods to the effects of climate change, the Project purpose to achieve this is via the improvement of PIC NMSs produced weather and climate services.

In achieving this Results 1 and 2 (as laid out in figure 2, below) features focused activities (and resulting costs) on technological improvements for PIC NMSs that will improve both the production values and quality of NMSs outputs. Improving the climate monitoring sites that collect meteorological data, and improving the systems that handle data and produce value added information products and services will improve the overall capacity and capability of the participant PIC NMSs to contribute better to the efforts of end users in grassroots communities and development sectors.

As such the success of the Project will be measured by the following indicators:

- Quality and quantity of agreements and processes established between NMSs and NGOs for provisions of weather and climate hazards information to support community development activities;
- NMSs participate in national disaster risk management mechanisms to a greater extent;
- Improved reliability and accuracy of weather and climate forecasts and warnings;
- New weather, climate and early warning services for the communities in use; and
- Women are given priority for capacity building activities taking into account the small amount of women in the professional community and the traditional role of women in the community

Progress will be measured by the following sources of verification:

- Project evaluation report;
- Statistics of disseminated warnings and products;
- SPREP reports;
- Project reports; and
- NMS recruitment policy inclusive of gender references.

4.3 Project Components and Related Results

The Project is divided into two inter-connected components, where the improved delivery of weather and climate services has an impact on villages' capacity to respond to climate

variability and extreme events as well as capacity to respond and adapt to climate change impacts (refer figure 2).

Figure 2: *FINPAC Project approach*

Result 1. Improved and new weather and climate forecasts and warnings by NMSs

Indicators:

- Seasonal and inter-annual climate services, such as ENSO outlooks and TC genesis risk, delivered by 60% of NMHSs by end of project implementation
- Lightning location data used in severe weather forecasting in at least five NMSs within two years of project start
- Automatically updated graphical products, such as a 5-day weather outlook, available on at least five PIC NMSs websites within three years of project start
- 21 silent Regional Basic Synoptic or Climate Network stations returned to service by third year of implementation
- Regional roving Quality Management System auditing team of five persons from PICs trained and available to the countries by third year of implementation

Result 2. Improved ability of the NMSs to respond the needs of villages with regard to hazardous weather and climate change

Indicators:

- Increased level of service delivered by NMSs in local PIC languages by end of project implementation
- All PIC NMSs have a website updated at least daily by second year of project implementation
- Each NMS has participated in the development of integrated Disaster Risk Management and Climate Change Adaptation Plans by the end of project implementation
- Prestige and visibility of the NMSs has increased in the eyes of the villages by the end of project implementation
- Weather warnings for the Pacific region aggregated into a single intuitive graphical product available online by the end of second year of project implementation
- Role of women improved through the creation of a network for women in meteorology and promotion of meteorology as a career by third year of project implementation by SPREP and NMSs
- Gender is recognized as an important aspect of adaptation to climate change and visible in the planning of the NMSs by the end of project implementation

- Lessons learned from the pilot projects in use by all NMSs by the end of project implementation

For a more detailed description on the Project components and related activities, please see Section 6: Work Plan. The complete project logical framework is given in Annex 1.

5. Approach and Strategy

The Project approach and strategy is based on building strong NMSs to serve the communities and most vulnerable villages to reduce their vulnerability to the impacts of weather extreme events and climate change. The village level is taken as the most vulnerable unit at the community and within the village level there are vulnerable groups such as women, children and the disabled. The livelihoods of all groups will be strengthened through the project intervention.

It is also recognized that there are existing village level arrangements that are supporting development at the village levels. These arrangements are closely linked to each PICs culture such as the village elders or chiefs, churches, NGOs and women's groups that are critical for the successful implementation and for the sustainability of this project. It is important that these groups or key figures are consulted and invited to participate at all levels of the project. The Project will work with one main NGO, the Red Cross Red Crescent Society that has a strong presence in the Pacific and has a wealth of experience in disaster management in communities.

Before any Project village level activity it is envisaged that a village stakeholder mapping will be undertaken to establish the most vulnerable and the key village decision makers to support the Project activities.

Similarly, at the national level the capacity and commitments of NMSs are also important and necessary for the project. The Project will also incorporate crosscutting issues such as gender and capacity building. Implementation will adopt best practices and align with key national and regional frameworks. With this approach, the impact of the project is being planned to make a difference at the village levels including gender and marginalized. It is expected that with the project intervention and intended key result areas vulnerable sectors of the community including women, men, children and disabled will have better access to weather and climate information and the enhanced capacity to use this information to improve their livelihoods and thus reduce their vulnerability to the impacts of climate change.

At the community levels, people live closer and depend on primary resources that are in turn shaped by the weather and the climate. It is envisaged that at this level access to information and capacity to apply these information in natural resources management will build the resilience of community and their livelihoods thus alleviating poverty and hardship.

5.1 Institutional Capacity

Institutional Capacity and specific institutions, i.e. vulnerable groups at the village level and NMSs, are the focus of this Project. Through strengthened village level arrangements and capacity, villages will be better positioned to respond to weather extreme events and

climate change. The NMSs are national institutions tasked with provision of crucial information for the safety and well-being of the respective villages. By improving the capacity of these institutions to operate effectively, the overall objectives of the Project will be achieved.

The Project institutional capacity building efforts will involve training at the village level and at the NMSs level with aspects of management, and development planning with the goal to provide the necessary skills needed to produce effective plans and goals that would strategically guide the village to build its resilience or the NMSs into sustainable operation and ability to cater for emerging needs of their communities and villages.

5.2 Gender Equality

Background

At the global level, the WMO has acknowledged the slow progress of a number of recommendations collected from conferences of Women in Meteorology (held in 1997, 2003). In a global survey it was found that an average of 23% of professionals in NMSs are women (in developed countries like the USA, a surprisingly lower average of 12% was found). The slow implementation of above mentioned recommendations is mainly due to a lack of follow up by Members and as a result a number of mechanisms have been put in place by the WMO, principal of which was the formulation and development of a WMO gender policy (Annex 19) in 2007 which provides a guideline for Member NMSs to develop at the national level. The WMO has also established an Advisory Panel of Experts on Gender Mainstreaming to provide to the WMO Executive Council activities of implementation of gender mainstreaming at all levels of WMO, including guidance provided to Members activities in this area.

Gender situation within NMSs in the Pacific

The meteorology work area in the Pacific is acknowledged to be lacking in gender balance, with an overwhelming ratio of men to women in the workplace. While a formal survey has yet to be undertaken specific to gender specific to the Pacific, a review of staff numbers and distribution amongst female and male shows that an average of 30% of females participate in NMSs work in the Pacific, and that a significant portion of this being deployed in support work rather than in policy or decision making work. Several Directors of Pacific NMSs allude to some underlying factors that refer to a general discouragement based on the nature of work, rather than the work area itself providing disadvantages to women being employed in such work.

One key common causal factor based on the nature of the work is the often late and odd hours of work, which led to clashes based on cultural issues and personal needs of potential female employees. Cited are the issues of the reluctance of females to work alone in late evening and early morning shifts (generally 4pm – 12am, and 12am – 8am shifts), both at a main office site or a remote site where often the deployed officer would be on his/her own. While safety could be considered an issue of potential resolution, often culturally this would be inappropriate for two unrelated persons of the opposite sex to work together during these hours should a security guard be hired for example (and for which should be noted that many NMSs in Pacific currently provide).

Women currently in these working positions often prefer daytime work hours to allow them to tend to family duties and needs in their roles as mothers and caregivers in their families, for societal and cultural reasons, at a cost that they acknowledge in terms of financial gain from receiving shift allowances and additional wages for shift or overtime work. They also cite reasons of shift work as being unattractive to remain in the meteorology work area in the long term if they were requested to take up those shift work hours as a mandatory and permanent fixture. It should be noted that while some women in NMSs are willing to undertake these shift working hours, the Director or head of the NMSs would often be reluctant to expose his/her female workers to any potential risks associated with evening/early morning shift work if the NMSs were not able to guarantee a level of security that the Director would be comfortably assured with.

A cumulative effect of this is the low number of women that are recruited and retained in NMSs deployment, and the often increasingly gender unfriendly work place that results (facilities and arrangements for women's needs are often not accounted for or often discounted, such as separate women's toilets, and accounting for maternal leave). While general conditions can and are provided for under the general Public Service Commission charter for fair employment, most NMSs are seen as lacking in effort to provide female friendly environs for their work. The low number of females in deployment also leaves some in isolation and in minority in terms of opportunities offered for further training or promotion.

It is a minor positive that there is a strong collegial bond between the few women in Pacific NMSs in professional roles, shared through years of attending training programmes and meetings together, a connection that should be further encouraged, for example through a formally recognized network.

For the long term, as found at the global level, many improvements to NMSs need to be made to encourage gender balance and gender friendliness both in terms of the kinds of deployment that women could be placed in, and the opportunities to be afforded to women to avoid denial of equal opportunities in the workplace. The FINPAC Project can provide some activities to support this, but it should be recognized that the nature of the NMSs work, and the capacities of NMSs in their current operation and status, make this a long term issue that NMSs ideally should work to resolve within their national settings.

Regional organizations perspectives

Gender inclusiveness is a key principle for the implementation and monitoring of this Project according to SPREP draft guideline on gender sensitivity and also in line with many of the participating countries national policy on gender. SPREP Project team seeks to ensure that a criteria for gender inclusiveness in all its activities.

In addition to the gender issues in the community, FINPAC will identify that the meteorology work area could be better highlighted to women as a potential career and employer, and that the existing collegial bond of women currently in NMSs in the region be further strengthened. Also, it recognizes that NMSs could be better informed of methods for improving their existing workplace conditions to better serve their female staff while also attracting more women to be interested to work at a NMSs. Defined activities thus involving gender awareness and equity considerations are listed as:

- Assisting NMS with promotion of meteorology as a potential career for women
- Establishment of a Pacific Women in Meteorology network of existing women professionals in NMS, providing support and a communication path for their

identified needs to be made available and visible at higher levels (such as in the Pacific Meteorological Council, WMO RA V)

In addition to the NMSs, in terms of the communities that will be assisted by FINPAC, it is proposed to:

Analyze gender issues:

- Identify areas at community levels that are constraints to gender inclusiveness.
- Identify cultural and traditional issues or procedures that also serve as constraints.
- Collect gender disaggregated data relating to the communities and making them available to Project facilitators and the participating community.
- Ensure that effective and culturally appropriate mechanisms are in place for input, discussions, conflict resolution, and negotiations regarding gender issues.

Promote gender integration at all levels of Projects and programs:

- Ensure the integration of gender perspectives in all Project activities
- Ensure gender inclusiveness in Project and program planning- and aiming towards a balanced representation of men and women in workshops and training.
- Ensure the participation of both men and women at the community level.
- Develop indicators to measure the effectiveness of Projects and programs with respect to gender inclusiveness.

Document and publicize gender highlights such as:

- The benefits of gender inclusion in Project implementation
- Information campaigns should be directed “upstream” to policy makers and other leaders and “downstream” to involved communities, implementers and other stakeholders.

The measurable indicators for gender issues for the Project are:

- Women are given priority for capacity building activities 1.1-1.4 and 2.1-2.2 taking into account the small amount of women in the professional community and the traditional role of women in the community
- Role of women improved through the creation of a network for women in meteorology and promotion of meteorology as a career by third year of project implementation by SPREP and NMSs
- Gender is recognized as an important aspect of adaptation to climate change and visible in the planning of the NMSs by the end of project implementation

The Project shall have special emphasis on providing a non-discriminatory environment in all of its activities. The Project shall not have any barriers for either gender to participate in Project activities and benefit from its results.

5.3 Poverty Reduction

PICs view climate change, climate variability, and sea level rise, not only as environmental problem, but also have significant economic and social dimensions which strike at the very

core of their existence. The impacts, and in particular the related economic and social shocks, pose serious social/political and financial management issues for PICs as climate extremes can adversely affect GDP, balance of payments, budget deficits, foreign debt, unemployment, and living standards. Many communities and people depend mostly on land and sea resources for their daily livelihood and income and it is these resources that tend to be affected most by the changing climate thus adversely affecting the ability and/or capacity to sustain livelihoods.

Pacific Island Countries and Territories are among the smallest (in terms of land area, population and economic wealth) and are amongst the most vulnerable in the world. Their vulnerability stems from their exposure to multiple natural hazards. Among the most destructive of these are extreme weather and climate events: cyclones, floods, storm surges and droughts.

The extent of damage from other hazards (such as an earthquake, a tsunami and a volcanic eruption) is also strongly influenced by the weather that preceded and accompanied them. For example: ash falls in Savo Island (Solomon Islands) were influenced by wind direction; landslides in the highlands of Papua New Guinea, along the highways of Palau and in central Viti Levu in Fiji were triggered by periods of intense rainfall. In general, higher risk of seismic liquefaction is present when vulnerable soils are saturated due to high groundwater level.

The effective and efficient provision of humanitarian response, relief and recovery activities immediately post-disaster is equally subject to weather and climate conditions.

The World Bank noted in 2006 that:

- Pacific Island countries rank among the most vulnerable in the world to natural disasters. Since 1950, natural disasters have directly affected more than 3.4 million people and led to more than 1700 reported deaths in the region (outside of Papua New Guinea).
- Cyclones accounted for 76 per cent of reported disasters from 1950 to 2004, followed by earthquakes, droughts and floods.
- Total reported cost of disasters in the 1990s alone is estimated at US$2.8 billion (over a 10-year period: this represents an average cost of US$280 million per year in the Pacific Islands Region).
- It is also recognized that Pacific Island Countries are among the most vulnerable to the adverse effects of climate change; particularly sea level rise, potential ocean acidification, and the security of food.

The economic and social costs, and frequency of adverse events, mean that Pacific Island Countries have a compelling interest in understanding weather and climate: so that they can prepare and protect themselves (disaster management) as well as reduce future risks. PICs are also in a unique position to contribute to global understanding of weather and climate through collecting meteorological data (observations) and sharing their knowledge.

Poverty reduction will therefore be an integral outcome of FINPAC in seeking to ensure enhanced information on climate change and weather risk to vulnerable communities in order to allow them to take adaptive measures and reduce risk.

Reducing poverty is the ultimate aim for most development activities and forms the backbone for funding this Project as well. Poverty reduction is the primary objective of the Finnish development policy and all of the Projects funded by MFA share this goal.

This Project will reduce poverty by improving the quality, level and access to weather and climate information to subsistence farmers and fishermen and to users whose livelihoods depend on the weather. Through improved information, farmers can better prepare for droughts and floods, plan which crops and seeds to plant, harvest before potential damaging weather events occur, and more effectively plan the use of their farmland. Fishermen will be able to assess the conditions at sea before leaving port, more accurately predict the movement of the catch with wind information, protect their valuable investment (e.g. fishing equipment and boat) before severe weather arrives, and optimize fuel consumption with wind information. These measures, enabled through improved weather and climate information, will reduce the losses and help make cost savings for farmers and fishermen.

Improving the participation of vulnerable groups or the poor in the development of weather and climate information is one of the results of the FINPAC Project. The participation of the poorest and most vulnerable groups in project activities will be a key element of the project. This will ensure that their needs are assessed, their capacities built and their resilience strengthened. This in turn will ensure the overall objective of the project is achieved and that all communities will directly benefit from the Project.

The Project success at this level of engagement will in turn lead to a greater ability of even the most vulnerable communities to improve their level of understanding of weather and climate phenomena including their adverse impacts and effects. Ultimately too, it would also mean that the appropriate responses are made by individuals and the community that would help to increase their level of climate change adaptation capacity and resilience to natural disasters. For Pacific NMSs, the Project success would be measured in the increased interaction with grassroots/community based end users, while improving their ability to delivery tailored weather and climate services.

Rural communities

Considering this unique opportunity to extend weather and climate services outreach to grassroots communities (no other known existing weather and climate services Projects target this level), the Project identifies the following as key activities that would improve the current situation of access and absorption of weather and climate services information and their use:

1. Grassroots community learning workshops on weather and climate products and services from local NMSs;
2. NMSs working with media outlets for weather and climate products and services on improving information reach to communities;
3. NMSs working with line ministries utilizing extension services (e.g. of fisheries, agriculture) such that community information centres are equipped with weather and climate information services.

The measurable indicators for community needs for the Project across the project lifetime are:

- Communities and villagers are confident that their vulnerability to climate change has been reduced during the project lifetime

- Communities and villagers feel that their communities are safer with regard to weather and climate related hazards following the project activities
- Communities and villagers are able to better address weather and climate threats to fishing and agricultural practices

5.4 Climate Sustainability

A key component of the project involves assisting NMS's address the important task of maintaining and enhancing the climate data records in their respective countries to ensure the long term sustainability of basic climate information for the purpose of adapting to climate change and climate extremes. Assessing strategies for adaptation require a sound understanding of the current climate system and its impacts on economic sectors such as agriculture, energy, water resource management, transport, infrastructure development and tourism.

By investing in specific activities to maintain and restore existing weather reporting stations, train local staff in maintenance, calibration and repair of such equipment, and build the capacity of NMS's to archive, analyse and report on current climate data better planning decisions will be forthcoming at the national and regional level.

6. Work Plan

This Project is divided into two result areas that follow the three-step approach to improving access to weather and climate information to the communities. The Project starts off with improving weather services, improves dissemination channels and endorses dialogue with end users and the NMSs to create a unique value-chain approach. The Project activities are assigned under the two result areas and form the operational structure for the Project. There are altogether 13 key activities in the Project that will be further divided into detailed tasks in annual work planning. The number is deliberately low to help keep the Project focused and make activity and finance reporting effective. There is a range of different activities and a wealth of interventions in the Project from regional workshops to hands-on training activities.

Inception Phase Results

Baseline Survey

In order to effectively measure the success or otherwise of the interventions planned for this project it will be necessary to undertake a comprehensive baseline survey in order to establish the initial reference points. This process will involve visiting each of the countries involved and meeting with NMS's and partners, NGO's and community groups, and other government agencies. The initial research will ascertain the pre-existing state of weather and climate human resource capacity, awareness of weather and climate issues, and other information necessary to measure the success or otherwise of each of the activities as per the indicators described in the logical framework (Annex 1).

The baseline study work during the inception phase of the Project will be coordinated by SPREP and implemented by the Red Cross. SPREP and the Red Cross will prepare a survey instruction to guide the baseline work to ensure consistency and conformity within each participating country and across the region. The results of the baseline study during the inception period will be used to realign the project objectives if required. Any modifications to the scope and outcomes of the project will have to be approved by the steering committee and the project financiers. A budgetary allocation of 40,000 EUR has been made for the inception phase of the project. The baseline survey will be completed within six months from the start of the inception phase of the project.

Work Plan for year one of the Project

The inception phase will produce the first annual work plan for the project drawing on the work done on the baseline survey in the first months of the project and the accordingly revised logical framework of the project. The annual work plan will contain a detailed description of the resources, schedule and results for the planning period. The annual work plan will be available within six months from the start of the inception phase.

Inception Report

The Inception Report will contain a separate report from the inception phase of the project before the start of the implementation phase of the project. The report will have a description of the activities carried out during the inception phase and the results achieved. The inception report will be available within six months from the start of the inception phase.

6.1 Result 1: Improved and new weather and climate forecasts and warnings by NMSs

Result 1 will bring significant improvements to the lives of villages and to the capacity of NMSs service to support needs on the ground. NMSs through the Red Cross will support villagers to reduce their vulnerability by the development of new products, introduction of new observation data feeds, improving the visibility, supporting quality work and strengthening the regional facility for meteorology and climatology at SPREP to provide the technical back stopping to villages through the NMSs and the Red Cross. The Result 1 has six activities that are described in more detail below.

6.1.1 Activity 1.1Implement Quality Management Systems

The implementation of Quality Management Systems (QMS) for aviation weather services in the Pacific was started in the FPPICS Project and was successfully started for all NMSs. Currently a number of PICs are extending the QMS to cover all aspects of their operations and going forward with certification of QMSs. This brings about the need for auditing as a continuous QMS practice for all of the NMSs. The current Quality Managers have not been trained for this as the focus has been on getting QMS in place.

Quality Management is an issue for the NMSs because of the demands by ICAO for all aviation weather services to be operated under a QMS by November 2012. QMS also helps the countries to improve their operations by pointing out gaps and creating Standard Operating Procedures for maintenance and forecasting. The

improved quality will result in better quality and availability of observations and forecasts, thus improving the weather products available to the public.

The Project will provide training workshops and Technical Assistance from the FMI to train a group of assigned NMSs staff members to perform audit missions. The team will be trained on-the-job and perform actual QMS audit missions to select countries, thus also helping the PIC NMSs in their QMS implementation work. The auditor team will remain at the disposal of the PIC NMSs after the Project finishes.

6.1.2 Activity 1.2: Training and data provision for improved severe weather forecasting

The greatest single hazard for the PICs is tropical cyclones and related storm surges. The region normally experiences 9-12 cyclones in a season from November to April with some of them making landfall in populated islands every year. The forecasting methods available normally include mainly Numerical Weather Prediction (NWP) models and satellite data to determine the location and intensity of the storm. In the larger countries such as Australia and New Zealand, the cyclone intensity and rainfall location is pinpointed with weather radar data. In the PICs, only Fiji has weather radar that supports Nadi international airport operations.

Lightning detection technology (see Annex 10) measures the electromagnetic field with a series of sensors to measure the location of a lightning strike from cloud to ground. The lightning detection data, especially overlaid with a satellite image, gives an accurate picture of the location of the severe weather associated with thunderstorms. The lightning detection data is available in near real-time (typical delay of 5-10 minutes) and acts in many ways like a weather radar for a vast geographical area. The setup of a complete detection network for the region would be virtually impossible and cost millions of Euros. The Project will purchase access to a global dataset instead for a fixed annual fee.

The Project will setup a lightning data feed directly for five PIC NMSs (Fiji, Papua New Guinea, Samoa, Tonga and Solomon Islands, chosen based on current weather forecasting ability) and a graphical product for the rest of the countries. The tool for visualizing the lightning data and overlaying it with any other data set is the FMI SmartMet software (see Annex 8), developed at FMI and donated to the Project without license costs. The Project will provide training and Technical Assistance by FMI to configure the system and the license for the Pacific lightning detection data set provided by a third party.

6.1.3 Activity 1.3: Training in the development and communication of climate services

The international community, through the establishment of the Global Framework for Climate Services (GFCS), has expressed a common wish to establish and improve climate services globally and to serve particularly the needs of the countries most vulnerable to climate change. The implementation of these services is at the responsibility of each national government with only a framework and small secretariat to be provided internationally.

Climate services come in a wide variety, depending on the socio-economic structure of the country and the capacity to address the identified needs. In the case of the Pacific Island Countries, the most potential services are seasonal to

decadal forecasts on rainfall and temperature tailored for the purposes of agriculture and water management in a simple and easy to understand format to enable early response to oncoming droughts or dry spells.

Currently, most PICs have little to no existing climate services with the main focus on severe weather warnings and aviation services. The potential benefits from climate services, however, are very substantial and this is a perfect time to support the establishment of climate services at the PIC NMSs. The Project will give basic training on the needs, design, implementation, operation, maintenance and communication on robust climate services to the NMHSs and SPREP with a particular focus on the two main user groups: agriculture and water authorities. The training will deliver the necessary tools and knowledge to begin implementation of sustainable climate services by the NMSs according to the needs and users of the country in question.

6.1.4 Activity 1.4: Implement weather forecasting tools and production systems at selected NMSs

SmartMet is a tool used by FMI to collate, view, analyse and interpret weather data and at the same time compose, edit, disseminate and archive weather forecasts in graphical and text formats. Those NMS's who would benefit from the use of SmartMet will be provided with the software and will receive training in its use by FMI. The SmartMet system is described in more detail in Annex 8. The system is used to produce new automated weather products and thus the activity forms the foundation for improvements in service provision. The Activity is thus closely linked with activities 1.2 and 2.2.

6.1.5 Activity 1.5: Training for improved maintenance and the rehabilitation of selected weather observation stations

According to the WMO, the Pacific is among the worst regions in the world in terms of availability of weather and climate data, only second to Sub-Saharan Africa. The WMO has defined a network of stations that make up the core global weather observations system, the Regional Basic Synoptic Network (RBSN). There are currently 21 stations in the Pacific included in the RBSN network that are not sending observations and/or are not working. This is a high percentage of the total number of RBSN stations in the region and severely impacts the weather forecast accuracy and understanding of current atmospheric conditions. The current situation also affects the early warning capacity of the NMSs as they do not have sufficient real-time information about the conditions in the areas affected.

The Project will rehabilitate these 21 silent RBSN stations, which are both Automatic Weather Stations (AWSs) and manual observation stations depending on the country. The issues with the observations sites range from lack of power to simple malfunctioning of barometers, for example. The Project will assign a local team of technicians to carry out the maintenance or rehabilitation work with Technical Assistance from the FMI. The Project will provide also the necessary spare parts for the stations and solve data communication issues. The pilot community projects will be connected to the weather observations as well and aim to improve the ownership of communities in the observation activities.

6.2 Result 2: Improved ability of the NMSs to respond the needs of villages with regard to hazardous weather and climate change

In the result area 2, the Project will address the delivery of weather and climate information to the final end users, fishermen, farmers and villagers on main and outer islands, who depend on weather and climate for their livelihoods. The activities for this result area are described below.

6.2.1: Activity 2.1: Training the NMSs to communicate with stakeholders in cooperation with NGOs

Linking the highly technical products and services provided by NMS's to the daily life of communities and villagers in the Pacific islands requires considerable and careful effort to ensure the communication is able to be communicated in formats and languages understood by the end users while at the same time retaining their valuable information. The project will facilitate training programmes and fund unique and innovative methods to educate end users on the value and use of weather and climate information. These may include, *inter alia*, posters and newsletters, TV and web based products, comics and other literature aimed at youth, theatre productions and dance.

The Red Cross will be engaged in this task, which will ensure materials are produced based on local languages and customs, including use of recognized geographical features and social structures.

6.2.2 Activity 2.2: Improve NMSs communication to users

This activity will focus on building the capacity of the villagers and vulnerable groups to access understand and apply weather and climate information for livelihoods planning and monitoring. The improved capacity of the villages will also be necessary for the development and implementation of the village disaster risk management and climate change adaptation plan.

The question of village level access to information needs to be considered together with the capacity of NMSs to disseminate information useful for villagers. Most of the NMSs do not have any kind of webpages for the general public. However, the PICs are strongly increasing their access to the Internet with mobile broadband and underwater high-speed cables being installed. For the NMSs, the major communication channel remains AM/FM radio and local newspapers. In most cases, there is no direct delivery of services to the public. The Project will train radio and newspaper journalists in weather and climate issues increase understanding of the phenomena and the products delivered by the NMSs and participating villagers on how to access information and how to apply this information for adaptation and mitigation planning.

6.2.3 Activity 2.3: Develop a joint platform for the sharing of warning in the Pacific following the "MeteoAlam" template

The MeteoAlarm service (www.meteoalarm.eu) began as a Project of the European Network of Meteorological Services (EUMETNET) and was launched in 2007 (see

Annex 6). It collects the pre-determined types of weather warnings at a national and municipal level into a single service where the user is able to view all standing weather warnings in Europe. The MeteoAlarm service is an innovative regional collaboration that greatly enhances the cooperation between the NMSs and brings their most important products, the weather warnings, to the reach of the general public. This concept has not yet been duplicated to other regions as such and currently there is no exchange of weather warnings between the PIC NMSs beyond the regional tropical cyclone warnings issued by Regional Meteorological Specialized Centre (RMSC) Nadi. Within the context of the WMO Tropical Cyclone Committee, the countries have agreed upon a common set of warning criteria and warning procedures.

The Project will introduce the MeteoAlarm concept to the Pacific, and adapt it to the region's needs. The original system will be simplified to reflect the vast geographical area (roughly 3 times the European area) and the small land mass and large maritime areas of the Pacific. In this activity, the Project will bring together the key stakeholders and work to define the warnings, exchange procedures and methodology and design of the website. The Project will provide resources for the workshops and Technical Assistance from the FMI, who has been involved in the original MeteoAlarm Project.

The provision of timely and accurate warnings for severe weather events is probably the most important task of a NMS. The project will support ongoing and new training for forecasters in the provision of warning services, especially in the area of communicating with NDMO's and emergency services. Such training events are routinely organized by WMO and regional partners (e.g. NOAA and BoM regularly offer forecaster training in tropical cyclone forecasting aimed to enhance skills and knowledge of forecasters in the region). Specific tools and information will be made available to assist forecasters will be identified and procured.

6.2.4 Activity 2.4: NMSs contribute to the development of village-level integrated disaster risk management plans in collaboration with NGOs, NDMOs and villagers

DRM and CCA action plans have been developed at the national level. However, none of these national plans have been developed at the community level. These activities will focus on developing village-level disaster risk management and adaptation plans in collaboration with NMSs and NDMOs and villagers. The plan will include early warning systems, risk reduction and adaptation, response, recovery and rehabilitation.

The community contingency plans will be developed in consultations with NMSs and other key service providers such as policy, health, media, Red Cross among others to ensure links with relevant sectors and agencies. Strengthening community arrangements and capacity to use the contingency plan will be part of this process including awareness programmes on how, when and who is responsible for operationalizing the plan. SPREP will provide technical support to ensure all stakeholders views and priorities are considered.

This activity will include a series of workshops and sessions facilitated by the Red Cross and SOPAC that bring the NMSs and end users together to define the services the NMSs delivers. Activity 3.2 also promotes the creation of models on how the communities can best use weather forecasts and climate outlooks for their benefit. Trainers will be experienced community level disaster management experts

from both Red Cross and SOPAC and training delivered to villages with participation and input from the NMSs.

6.2.5 Activity 2.5: NMSs collaborate with partners to develop understanding of weather and climate through village training projects

The effective delivery of weather and climate information to the public can be compromised by the use of scientific language and technical jargon not easily translated in to local languages. To assist in the greater understanding of weather information, NMS's will work with NGO's, the media, and community based organizations such as church and women's groups, to develop strategies to ensure vital weather and climate forecasts and warnings are communicated using appropriate languages familiar to the users of the information.

6.2.6 Activity 2.6: NMSs in collaboration with partners design and implement pilot projects on climate change and hazardous weather in selected most vulnerable villages

The activity will focus on innovative pilot Projects that allow for the communities to engage more with the weather and climate information and to create their own Projects where weather and climate information plays a role. The pilot Projects will be designed by the Red Cross together with NMSs, villages and SPREP and given for the villages to implement with Project resources. The Projects will improve the understanding and awareness of weather and climate events and also help in the adaptation to new climate conditions caused by Climate Change.

The pilot Projects can be anything from local radio stations to simple observation equipment to computer screens with the latest forecasts, whatever suits the needs of that community. The pilot projects form an integral part of the Project exit strategy to leave concrete cases on the ground on effective uses of weather and climate services for the benefit of communities. A small number of pilot Projects will be chosen for implementation based on a submission of Project concepts by the communities.

The pilot projects envisaged involve using Red Cross societies to work with NMS's in the 5 Pacific countries which will benefit from this activity. They are Tonga, Republic of the Marshall Islands (RMI), Tuvalu, Cook Islands and Niue. These are the countries that have completed their joint national action plan for climate change adaptation and disaster risk reduction and also these are countries where community level resilience activities have been identified as priorities. In addition Vanuatu and Samoa have their as a national DRM national action plan that could also apply.

The Project is currently planning for 8 pilot projects. The projects will likely be unique to the countries selected and will be developed implemented over a period of several months, with grass roots involvement at the village level of at least two weeks. Each pilot project will be assessed to determine its success through the established monitoring and evaluation process and where necessary refined accordingly for future implementation.

Successful projects can potentially be replicated through partnership with other regional projects established in the region such as PACC, COSPPac, or through additional funding from donors. The SPREP MCO will liaise with participating

countries through the PMDP and PMC to ensure the on-going sustainability of these pilot activities.

It should also be noted that under the current Joint National Action Plan (JNAP) programme SPREP will be working with SPC-SOPAC division to ensure countries are able to fund on-going work in developing their own resilience to natural disasters and climate change jointly with countries agreeing to commit funds for in country follow up on activities such as these.

6.2.7 Activity 2.7: Raise visibility and sustainability of NMSs services through a regional ministerial level meeting

With climate change adaptation now firmly established as an issue of the highest regional and global importance, NMS's require now, more than ever, the highest support from their respective governments in the task of collecting, analysing and archiving climate data, and the preparation of necessary climate information for planning and policy purposes. A meeting of regional ministers responsible for meteorological services is planned to raise the visibility of meteorological services and reaffirm their key role in the development and planning functions both nationally and regionally. The meeting will be convened in conjunction with a media programme aimed at raising the profile of NMS's in the PIC's.

6.3 Schedule of Activities

The FINPAC Project will be implemented from 2012 to 2015. During the four-year implementation period, the activities will be completed following the schedule given in the table below. There is a minimum level of activities for the first quarter of the year as this is the peak of the tropical cyclone season that ranges from November to April.

	2012				2013				2014				2015			
Activity	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**
Activity 1.1: Implement Quality Management Systems																
Activity 1.2: Training and data provision for improved severe weather forecasting																
Activity 1.3: Training in the development and communication of climate services																
Activity 1.4: Implement weather forecasting tools and production systems at selected NMSs																
Activity 1.5: Training for improved maintenance and the rehabilitation of selected weather observation stations																
Activity 2.1: Training the NMSs to communicate with stakeholders in cooperation with NGOs																
Activity 2.2: Improve NMSs communication to users																

Activity 2.3: Develop a joint platform for the sharing of warnings in the Pacific following the "MeteoAlarm" template																							
Activity 2.4: Development of village-level integrated disaster risk management plans in collaboration with NMSs, NDMOs and villagers																							
Activity 2.5: NMSs collaborate with partners to develop understanding of weather and climate through village training projects																							
Activity 2.6: NMSs in collaboration with partners design and implement pilot projects on climate change and hazardous weather in selected most vulnerable villages																							
Activity 2.7: Raise visibility and sustainability of NMSs services through a regional ministerial level meeting																							
Project Board Meetings																							

Table 1: *FINPAC Project Activity Draft Schedule*

7. Project Management

The Project will employ a full-time dedicated Project Manager for the project according to SPREP staff and remuneration policies. He/She will report to the Meteorology and Climatology Adviser (MeCA) and Climate Change Division managers in SPREP and will take responsibility of preparation of reports and organization of project activities under the supervision of the Project Steering Committee and SPREP Director General.

The SPREP organizational structure accommodates the Pacific Desk for Meteorology, which is currently composed of a Meteorology and Climatology Adviser (MeCA) funded by the Commonwealth Secretariat for two years, and the Meteorology and Climatology Officer (MCO) which is funded by the Australian Agency for International Development (AusAID) and a PI-GOOS Officer funded by UNESCO IOC, NOAA and BoM. The PI-GCOS Officer funded by the US is currently vacant but is expected to be filled before the end of 2012. The “Desk” forms the operational backbone for regional cooperation in terms of weather and climate services and will greatly assist in the implementation of this project.

7.1 Roles and Responsibilities

The project involves a number of different actors, each contributing towards the overall objective of the project. The following is a description of these functions for each of the parties concerned:

Organization	Role	Responsibilities
SPREP	Project Manager and substance expert	• Overall management/reporting of project • Financial management/reporting of non-FMI costs • Technical Assistance in the field related to its expertise as described in the Work Plan

		• Liaison with the NMSs, FMI, Red Cross and villages (where necessary)
FMI	Technical Assistance	• Financial management/reporting of its own personnel and travel costs • Expert assistance, training, consulting, software development and installation as described in the Work Plan • Reporting to SPREP and MFA
NHMSs	Beneficiary and development partner	• Collaboration with project experts in project activities • Releasing necessary staff resources for development activities, missions and other project work
Red Cross	Development Partner	• Grassroots level cooperation with NMSs • Liaison with village-level end users, organization of events, vulnerability and capacity assessments • Baseline and Endline studies
Communities/ Villages	End user	• Cooperation with project experts • Contribution to planning and training activities

7.2 Participation and Ownership

Two key levels of strategic participation and ownerships are highlighted here:

1) Participation and Ownership of NMSs

The Project activities will require preplanning with NMSs and target communities and villages ahead of implementation. An annual work plan for FINPAC activities will be required and the PMC consulted for feedback and insight and input into planned activities. The Red Cross provides the links from the Project to the village level through weather and climate services to the village levels with the NMSs.

2) Participation and Ownership of villages

Participating villages in the project will be the key beneficiary of the project. Village participation will determine and confirm Project activities and the services they require from the NMSs. The impacts of village groups' participation and ownership of project activities could be measured in the village resilience to weather and climate phenomena. The impact of the project could be felt long after the project ends if the village has the capacity to carry on and replicate lessons learned from the Project. This is the ultimate Project outcome that will support the livelihoods of village and ensure sustainability of the Project.

7.3 Management Structures

The FINPAC Project will be governed by an agreement between SPREP and the MFA and a separate agreement between FMI and MFA for the funding concerning FMI involvement. There will also be a MoU between SPREP and FMI on the Technical Assistance components.

For project management, advisory, implementation and monitoring, the Project will have a Management Team and Steering Committee to represent different stakeholders and to approve the Project reports and work plan (these are detailed further below).

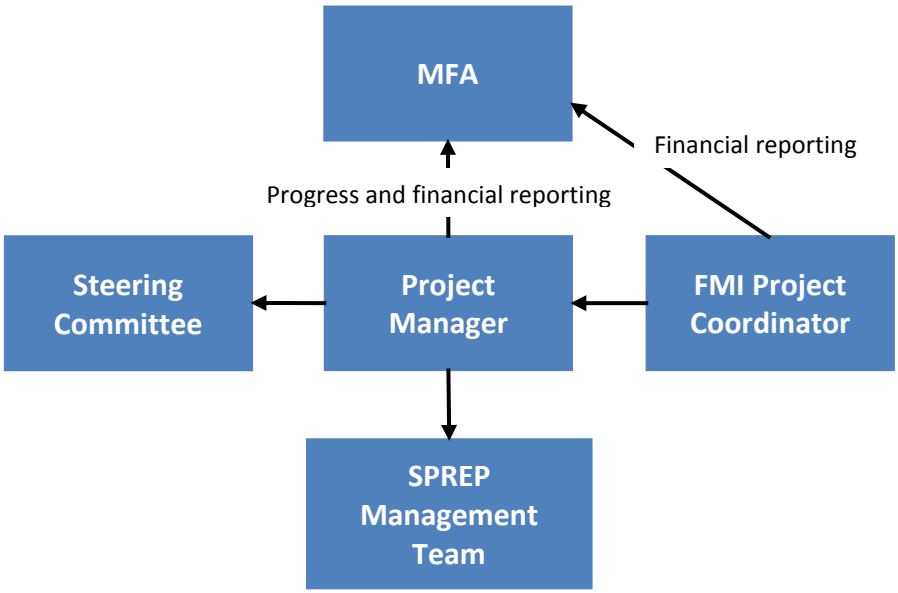


Figure 4*: Reporting responsibilities in the Project*

The management of FINPAC will involve SPREP as the key entity executing and implementing plans and activities and will be in close liaison with the indicated partner entities. The reporting responsibilities of the project are described in Figure 4 above. The Project Manager shall report the project progress to the MFA, Steering Committee and SPREP Management Team. The SPREP Management Team will support the implementation of the work and the Project Manager will be the main point of contact at SPREP regarding the FINPAC project. The FMI Project coordinator will report on FMI finances directly to the MFA as determined in the contract between FMI and MFA. Progress reporting will be carried out through the Project Manager.

Essentially, SPREP views its interaction as twofold in the management process of FINPAC.

1. Government of Finland and the Finnish Meteorological Institute are the primary Project management co-respondents that SPREP will work with to provide updates and progress tracking to ensure that the agreed work plan is delivering on target,

and that emerging or experienced issues are dealt with and risks to the Project minimized.

2. On the implementation side of FINPAC, SPREP will work closely with the PMC for the input and ownership of ground activity implementation when working with individual NMSs, share its FINPAC implementation work plan with the Pacific Meteorological Desk Partnership (PMDP) in particular assisting or requesting partnership assistance from the PMDP to implement activities. Finally the SPREP Meeting will be provided a progress update annually on FINPAC.

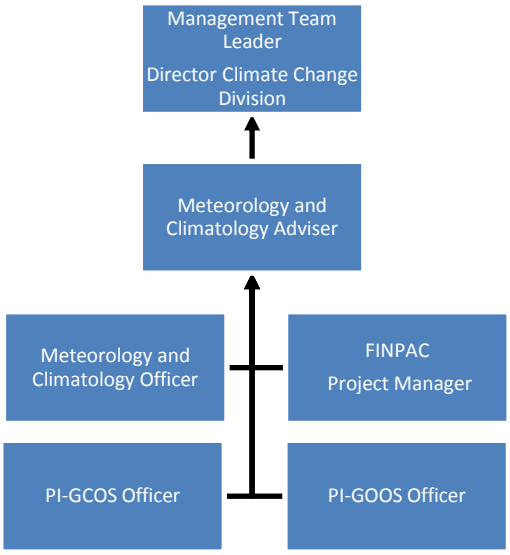


Figure 5: *FINPAC Project Management Team structure within SPREP*

The Project Management Structure as illustrated in Figure 5 reflects the flow of information/reporting/decision making processes and reflects the positions involved (the team).

The Team within the structure is responsible for the daily management and administration of the Project and the design and installation of the internal monitoring system including both quantitative and qualitative indicators. Management Team drafts the work plans and quarterly progress reports, and compiles the annual monitoring reports. Currently, this proposal document lists Management Team members who will act in place of incoming positions under recruitment at SPREP (these positions are noted below). Members acting in place of such positions will release responsibility of being Members to their successors.

i. Director, Climate Change Division
   - Monitoring of FINPAC work within SPREP
   - Steering Committee member

ii. FINPAC Project Manager: (to be recruited at SPREP)
   The Project Manager will provide overall leadership and overview of the FINPAC in particular the liaison with FMI and MFA counterparts in ensuring

the effective execution of FINPAC and achievement of program goals and activities.

Responsibilities

- Operational lead for FINPAC in terms of planning, monitoring and reporting, in consultation with Director, Climate Change Division and Project counterparts
- Preparation of project work plans, budgets and reporting in cooperation with the project Steering Committee and FMI Project Coordinator
- Provide contacts for the PIC NMSs and identify key personnel
- Active liaison with the PMC on implementation plans of FINPAC
- Integrate Project activities into the activities of the SPREP
- Disseminate Project information within SPREP
- Acts as Steering Committee secretary (not a SC member)

iii. Project assistant – Provided by SPREP

- Operational assistance to MeCA, and MCO personnel with support, planning, and execution of Project programme and activities in particular logistical arrangements of workshops, meetings, and contractual details related to the Project
- Assist where requested by Project Manager

Steering Committee

The Project will have a dedicated Steering Committee and it will represent the collaborating partners, MFA, SPREP, FMI, NMSs and representatives of participating communities. This team will work electronically as much as possible and will aim to meet on a quarterly basis, and also opportunistically, for example face to face meetings in the margins of a regional meeting (such as WMO TCC, Seminars etc., and PMC meetings). Travel costs for four Steering Group members once per year will be included in the Project from their country of origin to the meeting location for a two-day meeting. The Steering Group meeting shall be organized in SPREP facilities in Apia, Samoa or at an opportunity where the members will convene otherwise.

The Steering Committee members are:

- Finland MFA
- SPREP Director, Climate Change Division
- SPREP Meteorology and Climate Adviser
- FMI Project Coordinator
- WMO South West Pacific Regional Office
- Chair of Pacific Meteorological Council (Director of PIC NMS)
- Vice-Chair of Pacific Meteorological Council (Director of PIC NMS)
- Director, the International Federation of the Red Cross and Red Crescent Societies Pacific Regional Office

The SC will have the following functions:

- Discuss and approve the project annual work plan and budget

- Discuss and approve the project annual monitoring report and other possible reports presented by project management team/project manager and agree on actions to be taken to ensure the effective progress in the implementation of the FINPAC project
- Agree on possible alterations/amendments to the Project Document
- Guide and supervise the work of the Project Manager and the Project Management team
- Guide the activities of the project to meet regional, national and community/village level priorities and to identify potentials for synergies within the sector and between the project and other actors to achieve synergies with other donor supported projects and programs.
- Identify areas and actions where the FINPAC project could provide relevant input to raise the visibility of meteorological services at the country/ministerial level and thus influence to policies, strategies and actions on meteorology and further climate change adaptation and mitigation
- Provide policy guidance to FINPAC Project

Timing: Quarterly teleconference meetings, and annual meetings in conjunction with the PMC.

The Pacific Meteorological Desk Partnership is a new initiative that has emerged as a result of the FPPICS Project, the Review of Meteorological Services in the Pacific and the SPREP Meeting of 2010 in Madang, Papua New Guinea to strengthen the support given by SPREP to the PIC NMSs. The “Desk” brings together various funding agencies to support core functions of regional cooperation on the weather and climate services and coordinates development activities in the region.

PMDP has an important role in facilitating partnerships between NMSs and the community. Strengthening of the PMDP is synonymous with strengthening these partnerships at national and community levels to ensure that meteorological data and information and interpretations are useful for the needs of the community. This is important for the success of the project as strong partnerships needs to be build and nurtured. SPREP through the PMDP will play a key facilitation role.

7.4 Reporting

While FINPAC will contain many activities on an annual basis, reporting between key management partners is planned to be effective with consideration of reducing time consumption in preparation. In addition to the reporting below, the team will report annually to the SPREP meeting and bi-annually to the PMC on the progress of the Project implementation.

As such a proposed schedule of reporting will be based on bi-annual reporting from SPREP to Finland MFA, and will include the below reports initially (may be expanded on as required):

- Summary activity narrative – providing an overview of Project activities undertaken in PICs and/or coordinated by SPREP

- Mission reports, workshop reports – prepared and submitted on conclusion of such activities and key stakeholders at the village and national levels
- Biannual financial summary report on expenditures – providing updated tracking of finances related to the Project and providing measure against an annual budget and work plan
- Project Management report including Final Report – a Project management update and review of progress of Project activities and outcomes as well as explanations of emerging or encountered issues related to the Project
- Additional reports to WMO and its subsidiary bodies active in Regional Association Five (RA-V) as required.

7.5 The FMI Team

- Mr Jaakko Nuottokari – FMI Project Coordinator
  The FMI Project Coordinator will organize FMI work according to the project work plans and budgets. He/she will ensure the FMI resources for the project and will provide necessary information to the experts and to SPREP. See Annex 21 for a detailer Terms of Reference.
  Responsibilities
  - Financial reporting to MFA on FMI expenditure
  - Organization of FMI experts to project missions
  - Act as primary point of contact for the project in FMI
  - Assist Project Manager in development of work plans and budgets
  - Act as Steering Group member
  - Ensure that Finnish policies regarding development cooperation projects are followed and that the project follows MFA guidelines

Tasks of FMI Key Experts

The FMI experts are within the best international experts within their field and represent state-of-the-art knowledge of their respective subject matters. The dedicated training events will thus benefit from the latest research understanding and a profound experience base in operational weather services. The Key Expert Terms of Reference (ToR) are given in Annex 22.

Expert	Task	Capacity/Sustainability/Ownership Developed	Continuation of Task
Heikki Juntti	Hands-on training in two countries for a group of 5 key experts from PIC NMSs for quality management system auditing in the region. Training started in 2013 and group fully independent early 2015. *Activity 1.1*	• Creation of a self-sustaining group of QMS auditors in the Pacific composing five key auditor experts trained during the project implementation and with practical experience from auditing in at least two PIC aviation weather services • The group will be available for all PIC NMSs after the project implementation is finished for travel cost basis to carry out the essential continuous auditing of QMS required by e.g. ICAO • The group members will all be from	The task will be continued by the newly formed group who will train new members and continue to perform auditor tasks from travel cost basis (non-commercial, peer support)

		different PICs NMSs and will represent the best talent available for the work to be done in future years. The project will support the group to gain practical experience from QMS auditing. Mr Blanco is a certified QMS auditor qualified to carry out the training in question. The aim of the project is also to have at least two of the group members to receive official auditor certification	
	Hands-on training for QMS implementation in the PICs. The training will include two workshops and support between the workshops. The training will be organised in 2013 and 2014. *Activity 1.1*	• Develop capacity in the PIC NMSs to implement quality management systems, continuing the work of the FPPICS project and focusing on the countries with most challenges in the implementation • The capacity development activity will identify a quality manager who will take operational responsibility over the QMS maintenance and further development • The QMS is a tool desperately needed by all PIC NMSs to be able to provide aviation weather services, the most important function of the NMSs. The NMSs will thus take full ownership of the actions.	QMS development activities will be continued by a dedicated quality manager responsible for the further work required to keep the QMS operational
Antti Mäkelä	Training on the functioning and applications of lightning detection systems in the Pacific for all NMSs in 2013 and dedicated training for countries with forecasting duties on identification and limitations of lightning detection data in 2014. *Activity 1.2*	• Develop the capacity in all PIC NMSs to understand, interpret and use lightning detection information in the forecasting, early warning and disaster preparedness activities • Develop training material on lightning detection systems for free distribution for all NMSs online and link to existing training resources in e.g. COMET program. • Lighting detection data will be extremely important for the NMSs to track cyclones and severe weather systems. The NMSs will have a strong ownership of the data and applications that will allow them to better serve their respective communities	Identify key experts during training to act as local resource persons in lightning detection. Link key experts closely with FMI experts and other resources.
Sami Kiesiläinen	Training on the sustainable management, maintenance and	• The task will develop capacity in the PIC NMSs to better service observation stations, to have solid maintenance plans and standard operating procedures and	Identify key experts during training to act as local resource

	quality control of observation data from all data sources to all PIC NMSs in 2015 with special emphasis on the restoration of the silent synoptic stations and their continuing maintenance, support to SPREP on the coordination of the observation station maintenance crew *Activity 1.6*	to control the quality of observation data. The result will be in better quality observation data, reducing errors in all weather and climate services, warnings and products • Improved maintenance procedures and improved capacity to carry out these activities will result in more sustainable services as the maintenance is budgeted and planned well in advance. • Observation system maintenance is a key task for all the PIC NMSs and training in this regard is highly valued. The NMSs will take full ownership of the implementation and further development of maintenance measures	persons. Link key experts closely with FMI and SPREP experts and other resources.
Riikka Pusa	Hands-on training for SPREP and selected NMSs in the use of the weather forecasting tools and production system in operational weather forecasting. Trainees are all operational forecasters of the selected NMSs and the training is scheduled to take place in different countries throughout the project implementation. Training at the regional users meeting with all participating NMSs in 2015. *Activity 1.5*	• Training will develop capacity in the PIC NMSs to use the advanced forecasting tools and production system to deliver better and new products to the users of NMSs services • One system will be installed at SPREP with the specific function of developing support capacity at SPREP and to carry out training activities in SPREP facilities leading to improved sustainability. FMI will also support the system online and provide free system updates after the project implementation phase. • As the tools will enable the NMSs to produce much more products and to new users, and as most of the NMSs lack these tools, the NMSs will take full ownership of the system. The training tasks will be at the overall responsibility of SPREP after project implementation but with strong support from FMI. There will be a bi-annual user conference to address specific issues on the system	SPREP to organise bi-annual user conferences to discuss system issues and do follow-up training. Identify key experts during training to act as local resource persons. Link key experts closely with FMI and SPREP experts
Mikko Rauhala	Installation and basic training for ICT staff of SPREP and selected NMSs on the maintenance and configuration of the weather production system in different countries throughout the	• Training will develop capacity in the PIC NMSs to independently configure the production system and address any issues in the server or workstations • SPREP will take full ownership of the HelpDesk and the PIC NMSs from the operation and maintenance of the systems installed. Maintenance of the	The system installed at SPREP will be used by SPREP ICT staff to locate issues in the system configuration before contacting FMI. SPREP will

	project implementation *Activity 1.5*	hardware will be provided from the NMSs' maintenance budgets.	function as a HelpDesk for the system with full support from FMI
	Coordination of the development of a regional portal for weather and climate services and internet pages for all NMSs in cooperation with SPREP, sub-contractor and NMSs, training on the most effective use of online media for the general public through workshops for all PIC NMSs in 2013 and 2014 *Activity 2.2*	• Working with SPREP, NMSs and subcontractors to develop ICT and communication capacity in the PICs to deliver information and products via dedicated internet pages to the general public • NMSs will directly benefit and some have already started on this activity, the Project will build on existing resources with full ownership of the NMSs to continue to develop the online resources • Sustainability will ensured by SPREP through its coordinating role of the PMC	The future development and management of the national and regional webpages will be ensured through the coordination of SPREP ICT staff and a dedicated local resource in each country
	Training on the development of new weather, climate and early warning products using the weather production system and on the dissemination and visualisation methods of the products to the selected PIC NMSs and SPREP throughout the project implementation *Activity 1.5*	• The training will develop the capacity of the PIC NMSs to use new and existing information and products to generate products tailored for key users (e.g. most vulnerable communities, fishermen, agriculture) and to disseminate the products through the web, mobile and media channels in a way most useful to the customers • The new products will generate a growing interest in the activities of the NMSs, supporting the sustainability of the provided services and ensuring that the develop capacity is maintained by the NMSs • The PIC NMSs will take ownership of the future development of new products and services based on the documentation provided by the project and based on practical case studies from existing products	SPREP to organise bi-annual user conferences to discuss system issues and do follow-up training. Identify key experts during training to act as local resource persons. Link key experts closely with FMI and SPREP experts
Jenni Rauhala	Training and support for SPREP and all PIC NMSs on the development of a regional warning dissemination	• Training will support the development of a weather warning harmonisation, dissemination and visualisation tool following the European "MeteoAlarm" model. Training will build capacity required to implement the system from	System support tasks will be taken over by SPREP and a designated expert at each of the NMSs.

	channel and standardisation of warnings with two regional workshops in 2014 and 2015 *Activity 2.3*	all parties (SPREP, NMS and subcontractors) • The system will become an integral part of the delivery of warnings and will improve the severe weather forecasting activities at the NMSs. The NMSs will take full ownership of the system with the guidance and support of FMI and SPREP based on the tropical cyclone committee experiences and best practices.	Coordination of the system development will be provided by the PMC
Reija Ruuhela	Training on the development and operation of climate services for key stakeholders in the Pacific via workshops with participation from all PIC NMSs in 2013 and 2015 *Activity 1.3*	• The launch of the Global Framework for Climate Services (GFCS) by the WMO and the UN in 2013 will call for the countries to develop national strategies on climate services and will require that the countries consider what climate services they could offer, to who and how to deliver these services. Climate services will be especially important for the agriculture and disaster preparedness activities and thus this task directly supports the overall objective of the project by developing capacity at the PIC NMSs to deliver services on the future and past climate • Ownership and sustainability will be ensured by both SPREP and WMO who will coordinate the development of climate services in the region. The NMSs will take ownership of the implementation of new developments for climate services.	Further support to the development of climate services will be provided by the WMO and SPREP
Jaakko Nuottokari	Training to PIC NMSs in cooperation with the Red Cross on communication of weather and climate services to stakeholders in 2013 and 2015 *Activity 2.1*	• Developing capacity of PIC NMSs to effectively communicate relevant weather and climate information to key stakeholders leading to better decision-making and improved actions using that information • The training will improve the ownership of NMSs in the value chain leading to societal benefits and reduction in the loss of lives and property • The sustainability of the training will be ensured by creating standing working groups composed of the NMS, stakeholder and Red Cross to regularly	Task will be continued by standing working groups in each country composing the NMS, stakeholders and Red Cross

		discuss the performance and use of weather and climate services	

8. Risk and Assumptions

8.1 Risk Assessment

Below is an assessment of various types of direct risk events posed against to Project implementation success. Measures are described to minimize these risks. A grading scale of Overall Risk score is described below. In summary, the higher risks posed to the Project's success are those posed by adverse organization events as described below.

Description of Risk	Type of Risk	Consequences for the Project (1-5)	Likelihood of occurring (1-5)	Overall Risk (1-25)	Mitigation Measures
NMSs withdrawal from project participation	Political	3	3	9	Good communication strategy to elevate project profile right from the beginning Project linked to regional mechanisms (SPREP and members)
Earthquake and/or tsunami	Natural environment	3	3	9	Ability and flexibility of the Project to respond to any national emergency
Tropical cyclone	Natural environment	3	4	12	Supporting immediate needs in forecasting and EWS through the Project activities but maintaining long term capacity building
Ash cloud	Natural environment	3	2	6	Close monitoring of situation
Core funding reduction (for support positions in Pacific Desk Partnership support)	Organisational	5	3	15	SPREP on-going partnership building and Promoting of Project value
Pacific NMSs support decline	Organisational	4	3	12	Maintain high PMC engagement and profile of Project with Directors
Weak Project Partnership between NMSs and participating national communities	Organisational and key partnership relationship	5	3	15	Maintaining SPREP's facilitation role and ensuring a high project profile at the community level with timely delivery of project outputs and increased community awareness and participation

Pacific Meteorological Desk Partnership failure	Organisational	5	3	15	Maintain high engagement and profile of Project with Partners and donors
Committed partnerships under PMDP fail unexpectedly	Stakeholder relationships	3	1	3	Maintain high engagement and profile of Project with Partners and donors
Negative publicity of FINPAC Project	Media	4	3	12	FINPAC Project to deploy SPREP communication opportunities for awareness
Costs related to Project activities increase substantially	Commercial	4	2	8	FINPAC Project management team to keep abreast of activity related costs e.g. air travel, per diem etc.
Retention of key staff at the national and regional agency level	Organisational	4	3	12	FINPAC project management to involve a wider range of stakeholders, ensuring that all capacity is not resting on a limited number of posts.

Table 2: *FINPAC Risk Assessment Matrix*

8.2 Critical Assumptions

The critical assumptions for the Project to achieve key results are underpinned by the following:

- Political endorsement for disaster risk reduction activities received from national and regional government
- No disruptions in internet services
- Participating PIC NMSs do not face cuts in ICT budgets
- NMSs are not constrained from providing on-ground assistance
- QMS Roving team members remain committed and engaged
- Innovative solutions to end user needs developed in close collaboration by NMSs and users
- Technical capacity at NMSs is sufficient to provide content to the service
- Sufficient amount of women meteorologists join the network
- NMS directors motivated and engaged for development

8.3 Sustainability

The sustainability of project interventions and outcomes could be addressed at two levels:

1. At the regional level: the role of the Pacific Meteorological Desk Partnership (PMDP) is unique and relevant as this partnership is broader than SPREP and has the capacity to involve other donors and technical agencies to support FINPAC follow up activities. The PMDP as a secretariat will ensure that technical back stopping is available for NMSs during and beyond the life of the Project. SPREP's role is also critical for ensuring project sustainability through absorbing some of the relevant activities into its annual work programmes and providing assistance to NMSs through the PMC.

   When fixed assets are purchased for developing countries, sustainability of the technological investments needs to be taken into careful consideration. In this Project, sustainability has been the core value for all planned Project activities, but investments have been deemed necessary and well justified. The Project has sustainable solutions to its approaches and does not, for example, implement any new weather or climate observation stations but focuses on the maintenance and rehabilitation of existing stations that form the RBSN and on the increase of the capacities of PIC NHMSs on maintaining RBSN. The PIC NMSs are also given tools to automatically produce commercial weather products, websites to promote their services and products and communication equipment to disseminate their messages. The sustainability issues and estimated costs have been assessed in the table below.

2. At the national level: the partnership that will be built by the Project between NMSs and communities is the key mechanism for ensuring sustainability. This is why FINPAC is unique and will fill the gap which existing regional projects are not currently addressing, specifically strengthening the capacity of NMSs to provide the meteorological information required by community groups, vulnerable/disadvantage groups, including women and children.

Sustainability Issue	Solution	Cost approximation / yr.	Sustainability Potential	Sustainability Mechanism
Lightning data feed license	Cost recovery from paying customers of lightning data	$ 50,000	High	Per country service agreements with customers
MeteoAlarm maintenance cost	Part of SPREP core budget	$ 10,000	Very high	Integral part of SPREP core budget
SmartMet software applications	Online support by FMI	-	High	FMI offers free online support for software for as long as system in use at FMI or at least 10 years from installation
Restored Weather Observation station maintenance	Pooling of maintenance resources and expertise	$ 10,000	High	A maintenance fund under SPREP or WMO
QMS auditor team operation	Contingency staff and schedule of auditing	$ 5-10,000	Very high	Request by demand from each country

NMSs funding stability	Visibility and outreach campaigns	Within the Project budget	Very high	As part of the FINPAC Project
Community Project operation	Showcase Projects for potential funding agencies	Within the Project budget	High	Through SPREP core functions

Table 3: *FINPAC Sustainability Assessment Matrix*

8.4 Exit Strategy

The Project will build sustainable institutions in the Pacific that will evolve and continue to serve the people of the islands long after the Project has finished. The capacity building activities will continue to be coordinated by SPREP and the WMO based on ongoing evaluation of the needs of the end users of weather, climate and water products. The Project outcomes will guide the revision and development of the Pacific Islands Meteorological Strategy and the continuation of training events will be ensured by their inclusion in both national and regional priorities. The Project will result in recommendations for the PIMS for key training issues.

As the project is developing already existing institutions with steady funding from national governments, the key to the Project exit strategy is to ensure ownership of the final beneficiaries and stakeholders from day one of the project and to incorporate the changes initiated in the Project as normal practice in the NMSs. Ownership is ensured by promoting transparency, effective knowledge management and inclusiveness in planning, decision making and implementation of all project activities.

The pilot projects will work to leave solid operating models for the stakeholders to continue to expand and evolve according to their national and local needs. The projects will be rolled out by the Red Cross based on the activities dedicated for the design and implementation of the pilot projects. The supporting weather and climate services will be provided by the NMSs and buy-in secured from the national governments. All data from the pilot project will be collected and showcased in relevant international forums, especially the Pacific Meteorology Council and international climate change conferences.

The users of Project results are both the Met Services (NMSs) and the communities who will benefit from the interventions at the community level. Some equipment (under the RBSN upgrade activity) will remain with NMSs however mostly it is the knowledge, skills and other capacity improvements which will remain with the recipients of the various interventions aimed at achieving the project outcomes.

Activity / Equipment	**Responsibility after Project implementation**
NMS – NGO – Village dialogue	Standing working groups in each country to promote sharing of experiences and information between the NMS, villages, the government and NGOs for weather and climate issues
Meteorological training for forecasters	International donor support with coordination by SPREP and PMC

Manual synoptic weather and climate observation equipment	NMSs maintenance staff
Automatic weather production system with forecaster tools	NMSs ICT staff with SPREP support
Regional warning dissemination system	SPREP with NMS support
Webpages and portal	SPREP with NMS support
Meeting of the Pacific ministers responsible for meteorology	SPREP with PMC and support from international donors, WMO and NMSs

9. Budget and Financing Plan

9.1 Budget

TOTAL PROJECT BUDGET		
Activities		
Result 1		1 326 622,63 €
	SPREP	941 900,00 €
	FMI	384 722,63 €
Result 2		1 732 085,57 €
	SPREP	1 599 650,00 €
	FMI	132 435,57 €
	Total Activities	*3 058 708,21 €*
Project Execution Costs		
		Total
Full-time FINPAC Project Manager		240 000,0 €
SPREP Admin Fee		304 000,0 €
FINPAC Project Manager Travel		14 400,0 €
FMI Project Coordinator		49 742,2 €
FMI Project Coordinator Travel		24 496,0 €
Project Board Meetings		24 000,0 €
Red Cross Baseline/Endline Studies		60 000,0 €
Total Project Execution Costs		*716 638,2 €*
Total SPREP		3 183 950,0 €
Total FMI		591 396,5 €
Grand Total		**3 775 346,5 €**

Table 4: *Total FINPAC Project Budget*

Financial Commitment
The NMSs are under-resourced government agencies that take up a large portion of the national budget in the PICs due to the high costs of operating technical instruments. The FINPAC project does not add financial burden to the NMSs by introducing new and expensive equipment, but rather helps them restore existing observation sites. The PIC governments commit to operational expenses of 2 500 EUR / year through their maintenance budget and commit personnel for project activities of at least 2 Person-months / year, equivalent of a total financial commitment of 5 000 EUR / year or approximately 5% of the annual operating budget. This brings the total NMSs financial commitment over four years and 14 countries to 280 000 EUR.

SPREP will commit at least three staff members to the FINPAC management team to work on assisting the project implementation and will provide office facilities for the Project staff (MCO). Total financial commitment by SPREP to FINPAC will be 50 000 EUR over four years. Thus, the total financial commitment from the participating entities is 330 000 EUR.

Allocation of budget resources
The Project Budget is compiled to reflect activities performed by SPREP, subcontractors and participants together. From the total FINPAC budget of 3.8 MEUR, 3.18 MEUR will go through SPREP and 0.6 MEUR through FMI to benefit the final beneficiaries. The countries will receive in total 2 MEUR and 601 600 EUR is reserved for subcontracting to perform technical tasks. Main part of this sum is reserved for the Red Cross with additional funding for SOPAC and a private contractor for the web services development costs to carry out project tasks that require expertise beyond what is currently available at SPREP or at FMI.

Operational Costs
The Operational Costs budget section includes the costs related to the project results and activities that are by nature incurring from the operations but not specific work fees, travel costs, fixed assets or contingency funds. A typical example of workshop costs is the venue cost, communications costs, stationery, meeting refreshments, custom fees in some cases for equipment, etc. The budget line also includes the license fee for lightning detection data over the entire Pacific, customs and fees for spare parts of the observation stations and ICT equipment, publications to the public by NMSs, web portal hosting costs. Due to the nature of the FINPAC project, operational costs make up a large portion of the budget.

The SPREP administrative fee is the standard cost normally collected by SPREP for all externally funded activities and includes costs for financial management, bank fees, office facilities, assistants, and all collective running costs incurred to SPREP. By normal SPREP procedure, the fee is 10% of the total project budget (SPREP component) and is applied across the board for funding agencies. The administrative fee supports project activities and is not a separate overhead as SPREP is strictly a non-profit organization.

The Lightning Data License (activity 1.2) is a non-tangible data license that includes the supply of lightning location data in real time to the NMSs and displayed through the FMI SmartMet system along with other fields (weather satellite, ground observations) to assist weather forecasters determine the exact location and intensity of tropical cyclones and strong thunderstorms. The data is important for electricity transmission companies that use it to save maintenance costs for power lines and for civil aviation authorities to determine when to close down airport and re-route airplanes. The data can be sold from the NMSs to these users through separate contracts and this is encouraged in the Project to make the service sustainable after the project completion.

In activity 1.5, the administrative technical costs include the fees that may be incurred to the technical maintenance teams repairing silent observation stations. These are unforeseen but predictable costs from nuts and bolts, power cords, permit fees to import taxes that may be incurred to the teams. The FINPAC project will work with all beneficiary governments to waive customs and import taxes for the equipment and SPREP has previous agreements of such arrangements.

The Web Portal hosting costs in activity 2.2 and 2.3 are fees by internet service providers (ISPs) that maintain the web portal during the project and beyond. The portal costs will later be incorporated to SPREP core budget. The publications mentioned are printing costs for brochures and leaflets e.g. presenting the NMSs activities to customers and also the project publications in international meetings to promote the project and improve the visibility of weather and climate services in the Pacific.

The FINPAC project comprises equipment and hardware purchased through the Project and installed in the participating countries permanently. The assets will remain the property of the recipient country after their successful implementation and they will take full responsibility for the maintenance of the mentioned equipment. The equipment of the FINPAC project does not demand high technical maintenance and are suited for the Pacific climate and operating environment. The type and scope of equipment has been planned with particular emphasis on sustainability and maximum investment benefit for the weather and climate services.

The major equipment purchased in the FINPAC project can be divided into three separate units, the ICT equipment for the FMI SmartMet automatic weather forecast production system and visualisation tool, spare instruments for weather and climate observation sites and the assets required by villages to carry out pilot project using weather and climate services provided by the NMSs (e.g. power generator, small constructions, computer, weather station).

The FMI SmartMet system (described in more detail in Annex 8) is a software developed by FMI for its own operations and currently installed in Jamaica, Trinidad & Tobago, Austria, Estonia, and Latvia with funding from the MFA and the EU. In the FINPAC project, the SmartMet will be used to visualize lightning location data for the forecasters with numerical model fields, satellite images, weather radar images, ground observations and atmospheric soundings. The system will also automatically produce graphical weather forecasts for NMSs websites (also developed in the project) from numerical model data. The system is open for specifications by the end users for any type or public or private services. The FMI uses the system to generate over 1,000,000 products per day to hundreds of public or paying customers and is offering this technology to the Pacific through the FINPAC project with funding to install and configure the system. The system will remain in use at the NMSs as long as it is maintained by local NMSs staff and the FMI will offer lifelong online support to the system to address any technical issues related to the software. The system can and should be used to attract commercial revenue to the NMSs to support long-term sustainability.

Project funds will be used to purchase weather and/or climate observing equipment to restore the 21 silent RBSN stations designated by WMO as priority stations in the region. These stations are not functioning because of a number of reasons, from outdated and expired instruments to broken data transmission lines. Thus, the need for exact equipment will be formulated in the project work plans following information from the countries. The stations will be maintained by the NMSs after the initial investment from their operating

budgets. The stations will be mostly manual observing stations and thus equipment is foreseen to be simple and affordable. A single investment through the FINPAC project will bring the level of observations to an acceptable level and motivate the countries to maintain the equipment and system to ensure the functioning of services provided to third parties. Since the appraisal of the project was undertaken in April we have had occasion to discuss the parlous state of observing networks with NWS, BoM, and WMO. These discussions have clarified that there are partners involved in supporting observational data collection, but these are exclusively associated with either 1) establishing new stations (primarily for aviation, most of which are automated stations outside the RBSN) or 2) bilateral support for the global upper air network (GUAN); i.e. daily balloon flights to establish wind and temperature readings in the upper atmosphere. So we are confident that there are no overlapping activities in this specific area of re-establishing the RBSN stations in the region.

The village pilot project purchases for equipment or services are not yet defined as the Project will promote new and innovative project solutions to improve the use and effectiveness of weather and climate services in the villages and by fishermen, farmers and general public. The assets will be used based on pilot project submissions to the Steering Committee detailing the use of funds and the benefits for the villages. Altogether 8 pilot projects will be funded from the project funds.

Cross-cutting objectives budget

The project will address gender, inequality, poverty and climate issues and has been especially built around the climate as the main cross-cutting objective for the project. All of the activities in Result Area 2 (Improved ability of NMSs to respond to the needs of villages with regards to hazardous weather and climate change) reflect direct or indirect cross cutting interventions where assistance can be demonstrated to be addressing the concerns of the most vulnerable communities including women, children, the poor and those with disabilities.

Activity	Sub-Task / Indicator	Share of costs directly addressing cross-cutting objectives	Total
Gender Equality			
Activity 2.5: NMSs collaborate with partners to develop understanding of weather and climate through village training projects	Gender visible in the work and planning of NMSs	20 %	41 310,00 €
	Gender is recognized as an important aspect of adaptation to climate change		
Activity 2.7: Raise visibility and sustainability of NMSs services through a regional ministerial level meeting	Creation of a network for women in meteorology	10 %	27 415,00 €
	Information campaign to policy makers and other leaders in gender equality		

Baseline Study by Red Cross	Identify areas at community levels that are constraints to gender inclusiveness. Identify cultural and traditional issues or procedures that also serve as constraints	20 %	12 000,00 €
Inequality/Poverty Reduction			
Activity 2.2: Improve NMSs communication to users	NMSs working with media outlets for weather and climate products and services on improving information reach to communities	80 %	224 244,86 €
Activity 2.4: Development of village-level integrated disaster risk management plans in collaboration with NMSs, NDMOs and villagers	NMSs working with line ministries utilizing extension services (e.g. of fisheries, agriculture) such that community information centres are equipped with weather and climate information services	100 %	241 500,00 €
Activity 2.5: NMSs collaborate with partners to develop understanding of weather and climate through village training projects	Grassroots community learning workshops on weather and climate products and services from local NMSs	80 %	165 240,00 €
Activity 2.6: NMSs in collaboration with partners design and implement pilot projects on climate change and hazardous weather in selected most vulnerable villages	Specific projects aimed at reducing vulnerability of the most poor to the effects of climate change	100 %	220 000,00 €
Climate Sustainability			
Activity 1.1: Implement Quality Management Systems		100 %	185 883,53 €
Activity 1.2: Training and data provision for improved severe weather forecasting		100 %	314 399,41 €
Activity 1.3: Training in the development and communication of climate services		100 %	105 384,05 €
Activity 1.4: Implement weather forecasting tools and production systems at selected NMSs		100 %	269 952,61 €
Activity 1.5: Training for improved maintenance and the rehabilitation of selected weather observation stations		100 %	451 003,04 €
Total Budget directed for addressing cross-cutting objectives			**2 258 332,49 €**

Table 5: *Budget for Cross-cutting objectives*

Activity	Cost
Activity 1.1: Implement Quality Management Systems	185 883,53 €
Activity 1.2: Training and data provision for improved severe weather forecasting	314 399,41 €
Activity 1.3: Training in the development and communication of climate services	105 384,05 €
Activity 1.4: Implement weather forecasting tools and production systems at selected NMSs	269 952,61 €
Activity 1.5: Training for improved maintenance and the rehabilitation of selected weather observation stations	451 003,04 €
Sub-total Result 1	**1 326 622,63 €**
Activity 2.1: Training the NMSs to communicate with stakeholders in cooperation with NGOs	275 139,36 €
Activity 2.2: Improve NMSs communication to users	280 306,07 €
Activity 2.3: Develop a joint platform for the sharing of warnings in the Pacific following the "MeteoAlarm" template	234 440,14 €
Activity 2.4: Development of village-level integrated disaster risk management plans in collaboration with NMSs, NDMOs and villagers	241 500,00 €
Activity 2.5: NMSs collaborate with partners to develop understanding of weather and climate through village training projects	206 550,00 €
Activity 2.6: NMSs in collaboration with partners design and implement pilot projects on climate change and hazardous weather in selected most vulnerable villages	220 000,00 €
Activity 2.7: Raise visibility and sustainability of NMSs services through a regional ministerial level meeting	274 150,00 €
Sub-total Result 2	**1 732 085,57 €**

Table 6: *Project Budget by Activity*

Budget lines	Total costs in 2012	Total costs in 2013	Total costs in 2014	Total costs in 2015	Total costs	%
A. Technical assistance costs						
A1. Fees						
- Project Manager	24 000,00 €	72 000,00 €	72 000,00 €	72 000,00 €	240 000,00 €	6 %
- SPREP MeCA and MCO	8 000,00 €	24 250,00 €	37 500,00 €	24 000,00 €	93 750,00 €	2 %
- FMI Project Coordinator	9 948,45 €	13 264,60 €	13 264,60 €	13 264,60 €	49 742,25 €	1 %
- FMI Experts	11 135,73 €	161 553,24 €	150 941,56 €	10 611,68 €	334 242,21 €	9 %
TOTAL, Fees	**53 084,18 €**	**271 067,84 €**	**273 706,16 €**	**119 876,28 €**	**717 734,45 €**	19 %
A2. TA Reimbursable costs						
Project Manager						
- Travel Costs	1 000,00 €	3 000,00 €	3 000,00 €	2 000,00 €	9 000,00 €	0 %
- Per diems	600,00 €	1 800,00 €	1 800,00 €	1 200,00 €	5 400,00 €	0 %
SPREP MeCA and MCO						
- Travel Costs	6 800,00 €	23 800,00 €	33 600,00 €	23 400,00 €	87 600,00 €	2 %
- Per diems	3 500,00 €	17 200,00 €	22 700,00 €	12 800,00 €	56 200,00 €	1 %
FMI Project Coordinator						
- Travel Costs	5 000,00 €	5 000,00 €	5 000,00 €	5 000,00 €	20 000,00 €	1 %
- Accommodation	780,00 €	780,00 €	780,00 €	780,00 €	3 120,00 €	0 %
- Travel allowances	600,00 €	1 800,00 €	1 800,00 €	1 200,00 €	5 400,00 €	0 %
FMI Experts						
- Travel Costs	10 000,00 €	45 000,00 €	40 000,00 €	5 000,00 €	100 000,00 €	3 %
- Accommodation	2 860,00 €	28 590,00 €	26 770,00 €	1 820,00 €	60 040,00 €	2 %
- Travel allowances	690,00 €	10 709,00 €	10 021,00 €	432,00 €	21 852,00 €	1 %
TOTAL, TA reimbursable costs	**31 830,00 €**	**137 679,00 €**	**145 471,00 €**	**53 632,00 €**	**368 612,00 €**	10 %
A3. Subcontracted work						
- Red Cross	51 500,00 €	69 500,00 €	80 000,00 €	86 000,00 €	287 000,00 €	8 %
- SOPAC	4 500,00 €	9 000,00 €	9 000,00 €	4 500,00 €	27 000,00 €	1 %
- Web Development	6 000,00 €	52 000,00 €	61 600,00 €	6 000,00 €	125 600,00 €	3 %
- Obs Maintenance Crew	8 000,00 €	24 000,00 €	32 000,00 €	24 000,00 €	88 000,00 €	2 %

- Interpretation and conference	0,00 €	0,00 €	0,00 €	74 000,00 €	74 000,00 €	2 %
Sub-Total A3	**70 000,00 €**	**154 500,00 €**	**182 600,00 €**	**194 500,00 €**	**601 600,00 €**	16 %
A4. SPREP Management Fee (10% of SPREP project costs)	**30 400,00 €**	**91 200,00 €**	**91 200,00 €**	**91 200,00 €**	**304 000,00 €**	8 %
B. Operational costs						
- Participant travel to training, workshops, events	26 800,00 €	246 300,00 €	270 400,00 €	271 850,00 €	815 350,00 €	22 %
- Training materials, manuals, publications	2 000,00 €	44 850,00 €	59 850,00 €	64 850,00 €	171 550,00 €	5 %
- Workshop costs (venue, catering, transport, etc.)	6 500,00 €	32 500,00 €	37 000,00 €	48 500,00 €	124 500,00 €	3 %
- Purchase of licenses, web portal hosting costs	0,00 €	75 000,00 €	75 000,00 €	75 000,00 €	225 000,00 €	6 %
- Equipment, spare parts	15 000,00 €	61 000,00 €	76 000,00 €	45 000,00 €	197 000,00 €	5 %
- Customs payments	3 000,00 €	9 000,00 €	9 000,00 €	3 000,00 €	24 000,00 €	1 %
- SC Meeting costs	6 000,00 €	6 000,00 €	6 000,00 €	6 000,00 €	24 000,00 €	1 %
TOTAL, operational costs	**59 300,00 €**	**474 650,00 €**	**533 250,00 €**	**514 200,00 €**	**1 581 400,00 €**	42 %
C. Contingency	**11 500,00 €**	**62 000,00 €**	**70 000,00 €**	**58 500,00 €**	**202 000,00 €**	5 %
TOTAL	**256 114,18 €**	**1 191 096,84 €**	**1 296 227,16 €**	**1 031 908,28 €**	**3 775 346,45 €**	

Table 7: *Project Budget Annual Distribution*

9.2 Financing Plan

The Project will be funded by the MFA grant but will be complemented by an in-kind contribution of 20% working time from 3 Project Officers and 1 Support Staff from SPREP, amounting to an approximate financial contribution of approximately 55 000 € or 1.7% of total Project value.

10. Monitoring and Evaluation

10.1 Monitoring

SPREP routinely collects mission Terms of Reference before every expert mission and Expert Mission Reports one week after the missions. The mission reports form the core of the progress reports and are delivered to the Steering Committee. The Project will be invoiced at the beginning of each calendar year and expenses will be reported twice a year in connection to the bi-annual reports, in June and December of each year. After two years, in the mid-point of the Project, a more extensive Mid-Term Progress Report will be delivered with an evaluation report of the progress made.

The SPREP Internal Auditor and accounting and secretarial staff will ensure financial monitoring of the Project. A recent EU Audit has confirmed the excellent financial practices of the SPREP. The Audit report has been delivered to the MFA for review. Real-time financial information is available through the SPREP systems on the Project expenses incurred. SPREP will undertake project audits annually it its own expense and report on the findings of the audits to the Project Management Team and through them to the Project Steering Committee.

The Project information and relevant documents will be available at all times through the SPREP Website (www.sprep.org) for all Project stakeholders. The information will be stored for three years after the completion of the Project.

The Steering Committee may require additional monitoring and evaluation where appropriate such as a mid-term review or a special report from the community/village level and it is the task for the Project Management Team to include this in the work program.

10.2 Evaluation

Project evaluation will be carried out by the MFA. The evaluation reports will be processed by the Steering Committee and recommendations adopted for the remaining Project. The evaluation will look at the relevance, feasibility, sustainability, purposefulness, impacts, effectiveness, results and efficiency of the Project implementation.