



PACIFIC
METEOROLOGICAL
COUNCIL

PROJECT CONCEPT PAPER

Meteorological Needs in the Pacific Region

Version 3.0 (05 June 2013)

1.0. Background

This paper is commissioned by the Pacific Meteorological Council (PMC) as a first step to engage donor interests in supporting meteorological services in the Pacific Region. It is by no means an exhaustive paper but an attempt nevertheless to provide information on what are critical areas of support that the PMC in collaboration with Pacific Island Governments, are seeking funding assistance from potential development partners.

2.0. Purpose of the Pacific Meteorological Council

The purpose of this strategic partnership alliance is to:

- (a) Consolidate the vast network of meteorological services providers for the Pacific region and where possible, work to strengthen the coordination of technical and policy services to National Meteorological Services (NMSs) in all the Pacific Island Countries and Territories (PICTs).
- (b) Deliver advanced meteorological services including early warnings to the PICTs.
- (c) Contribute to building of resilience to climate change and climate variability through improvements in disaster risk reduction and disaster risk management in the PICTs.
- (d) Support gender mainstreaming through disaggregated data analysis for impact assessments on local communities as a result of severe weather events and climate variability.
- (e) Improve sharing of meteorological data among the PICTs and other NMSs from outside the region.

3.0. Pacific Islands Meteorological Strategy 2012-2021

This concept paper is fundamentally based around the niche created by the Pacific Island Meteorological Strategy (PIMS) 2012-2021. Its contents flow directly from this Strategy and works to support the achievement of its prescribed objectives and priorities. These are;

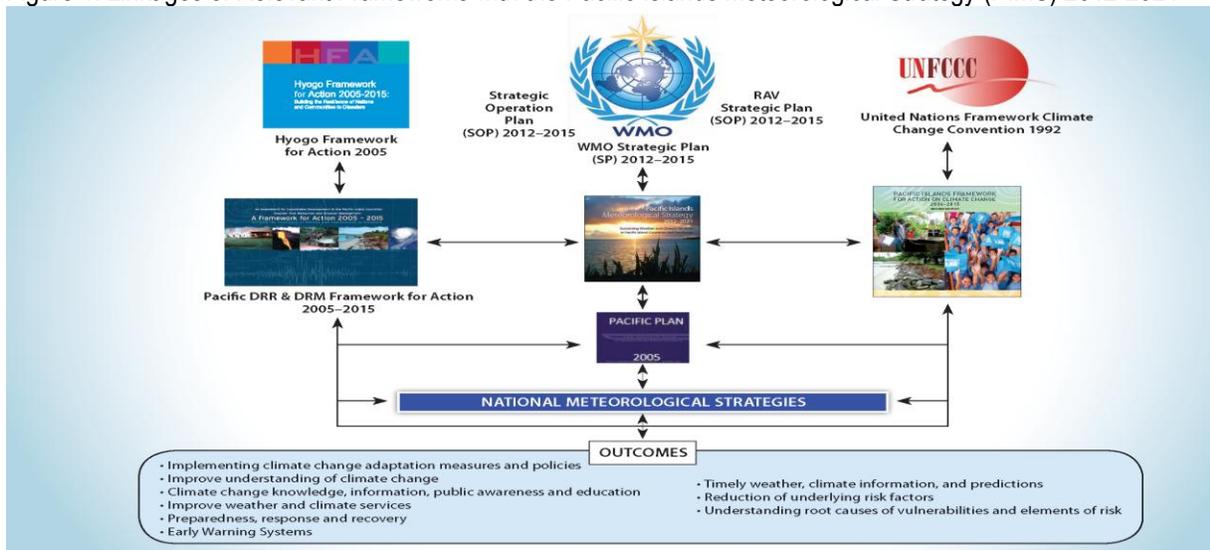
1. Overall Objectives:
 - Ensure the safety, security and wellbeing of their people.
 - Contribute to achieving sustainable development.
 - Fulfill the PMC member and the PICTs' commitments and obligations under relevant regional and international agreements and conventions.
2. Specific Objectives are to:
 - Provide the guiding framework for addressing NMSs' priorities through strengthened regional coordination.
 - Guide donors and development partners to focus on priority capacity building activities and transfer of technology identified by the NMSs that may be delivered either bilaterally or through regional approaches.
 - Guide the NMSs towards critical activities aimed at building or strengthening capacity and planning and implementing national projects.
 - Guide the PMC and the Pacific Meteorological Desk Partnership (PMDP) with respect to sustaining priority actions at the regional level.
3. Priorities focus on the following areas for action:
 - Improved weather services, in particular, aviation, marine and public weather services.
 - Improved end-to-end Multi-Hazard Early Warning Systems.
 - Enhanced infrastructure (data and information services) for weather, climate and water.
 - Enhanced development of climate services.

4.0. Partnerships and Linkages

The PMC works in close partnerships with multiple global and regional frameworks to advance the development of meteorological services in the region. Strategically, linkages are drawn with the Strategy with the Pacific Islands Framework for Action on Climate Change, the Pacific Disaster Risk Reduction and Disaster Management Framework for Action 2005-2015, the Pacific Plan and other relevant global Multi-lateral Environmental Agreements (MEAs) or frameworks such as the WMO Strategy Plan 2012-2015, the Hyogo Framework for Action and the United Nations Framework on Climate Convention.

Figure 1 illustrates that although each of the related regional policies and strategies originated from separate global institutions, there are clear linkages at the regional level where the regional frameworks contribute to similar outcomes. Explicit linkages between regional and global and regional MEAs or policies/strategies/frameworks and the PIMS.

Figure 1: Linkages of Relevant Frameworks with the Pacific Islands Meteorological Strategy (PIMS) 2012-2021



Source: Pacific Island Meteorological Strategy 2012-2021.

5.0. Institutional Arrangements

A series of related institutions and structures are already in place to support the implementation of this Strategy. The PMC is a specialized subsidiary body of the SPREP Meeting; and the SPREP Secretariat acts as Secretariat and host organization for the Council through the PMDP. The SPREP Meeting is the governance mechanism with respect to PMC mandate and Terms of Reference. Through the PMDP within the SPREP Secretariat, the annual SPREP Meeting will be kept informed of the operation of the PMC and progress in the implementation of and meeting the PIMS objectives.

The PMDP will assist the PMC and the NMSs in securing resources to implement this Strategy, addresses gaps and challenges and will report to the Council.

The PMC takes on a key role through the adoption of this Strategy, which provides guidance on national and regional actions. It will take responsibility for ensuring coordination at the regional level and for advocating and monitoring the Strategy. The Council will also oversee initiatives taken to implement the Strategy at a regional level. In particular, it

will seek to ensure appropriate accountability in relation to funds, and promote activities that are aligned with the priorities and principles set out in this Strategy.

At the national level, the NMSs will work to achieve their respective priorities and objectives in the context of National Meteorological Plans developed through their respective Ministries or Departments, which are also linked to the PIMS. Figure 2 shows the institutional arrangements.

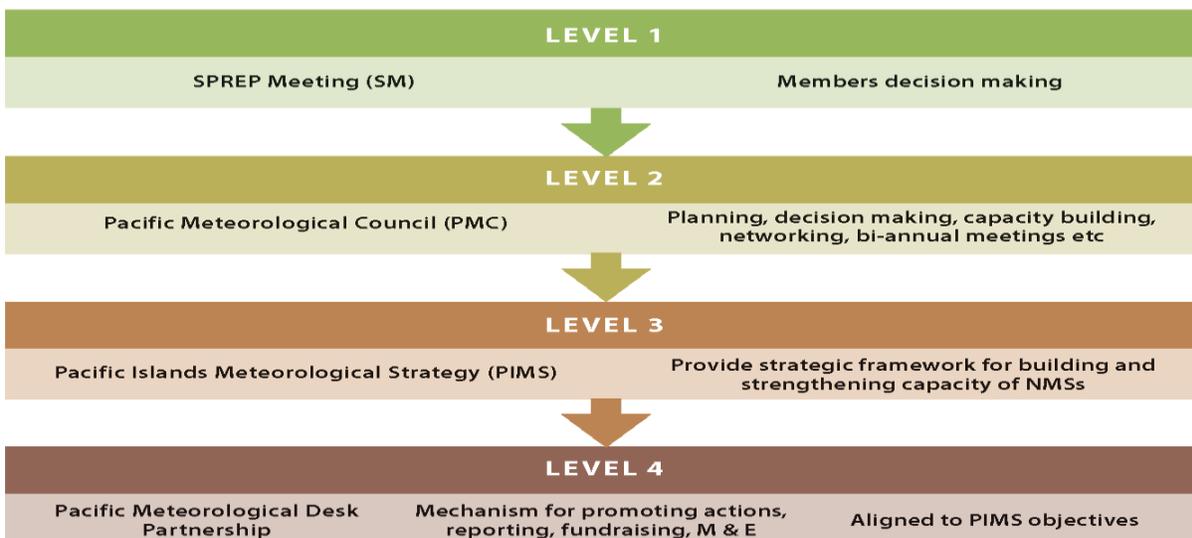


FIGURE 2: PIMS INSTITUTIONAL ARRANGEMENTS

Source: Pacific Island Meteorological Strategy 2012-2021.

6.0. Proposed Project Components

There are 4 components representing the demand for meteorological services in the Pacific region. They are: 1) Technical services; 2) Legislation, Policy and Coordination; 3) Institutional Capacity; and 4) Capacity Development. All (meteorological) development projects designed for the Pacific Region will to some degree support either one of these components or preferably, all of them. The full suite of actions, are integrative in nature and intended to reinforce one another so as to deliver maximum impact in strengthening in-country meteorological services of the PICTs. Specifically, these are elaborated in details below.

Component 1: Technical services

6.1. Meteorological information for civil aviation

Nearly all of the PICTs' NMSs are providing meteorological information for civil aviation. Recently driven by the International Civil Aviation Organization (ICAO) Regulations, the NMSs are required to put in place Quality Management Systems (QMSs) to meet the International Standard Organization (ISO) 9001 Standards and Competency Assessment for Aviation Meteorological Personnel; and improving current aerodrome routine meteorological reports (METAR) and aerodrome special meteorological reports (SPECI), and occurrence or expected occurrence of specific en-route weather phenomena which may affect the safety of aircraft operation (SIGMET).

Currently, Fiji Meteorological Service has been certified to ISO 9001 Standards. Cook Islands, Solomon, Tonga and Vanuatu have established QMS for aviation weather services but they would require a significant assistance to bring them to the level of the ISO 9001 Standards. The remaining PICTs are seeking to set-up the QMS for aviation weather services.

Nearly all of the PICTs' NMSs personnel have a role in providing meteorological information for international civil aviation. However, they are yet to establish Competency Assessment of Aviation Meteorological Personnel that requires an assessment and designation of a local staff as an Aviation Meteorological Personnel who is ICAO certified by 1 December 2013. Countries that do not meet this requirement must ensure that their national Meteorological Authority registers their non-compliance with the ICAO by this date or run the risk of being held accountable for any meteorological related accidents or incidents that occur within their airspace. The legal implications are significant for not doing so and the ICAO could potentially seek other providers to meet the need for services in airspace where the meteorological services provider is deemed not competent.

According to the International Civil Aviation Report on Air Navigation Deficiencies in the Met Field in the Asia/Pacific Region, some PICTs (Kiribati, Nauru and Solomon Islands) do not provide adequate and regular quality METAR and SPECI services. In many cases, there is severe deficiency in supplying METAR and SPECI which has been the case for some time now. It is now imperative that improving the METAR and SPECI is not only urgent but a necessity for safe and secure air navigation in the Pacific region. Furthermore, improving the METAR and SPECI are pre-requisite for improving aerodrome forecast (TAF). Some airline companies in the Pacific region have issued complaints about the quality of the TAF for PICTs' aerodromes. Low quality TAF will force airline companies to compensate by fuelling more (for every flight sector) for unexpected extreme weather which directly leads to a higher fuel bill and costs extended to passengers. IATA has emphasized the importance of weather hazards reported in the large sub-region area that straddles the equators and deemed the lack of SIGMET over this area as unsafe and unacceptable to airline operation. Annex 3 to the Convention for International Civil Aviation specifies the meteorological reports for international civil aviation. Section 3.4 of the Annex defines the responsibilities of a Meteorological Watch Office (MWO), and one of its tasks is to provide SIGMET services. The Fiji Meteorological Service is the ICAO designated MWO and thus provides the SIGMET within Fiji's Flight Information Region (FIR). Similarly, Papua New Guinea's National Weather Service is also an ICAO designated MWO and provides the SIGMET for Papua New Guinea's FIR. However, according to ICAO Report on Air Navigation Deficiencies in the Met Field in the Asia/Pacific Region, there is lack of SIGMET issued for Port Moresby, Honiara and Nauru FIRs. With the exception of Fiji, all other PICTs have weak institutional and technical capacity to supply SIGMET.

6.2. Climate services

The Global Framework for Climate Services (GFCS) is an international initiative led by the WMO and aims to support countries including the PICTs and their NMSs by enhancing their capability to produce and disseminate better climate and environmental related information, predictions and prediction products and services to support effective climate risk management, including climate change adaptation strategies, decision making and actions. Climate change poses one of the greatest challenges facing human society in contemporary times. Unequivocal and unyielding climatic trends overlaid by increasing climate variability are already critically impacting socio-economic development and the environment.

The sharp rise in economic, social and environmental damage in recent decades due to weather and climate extremes is, in part, a testimony to our lack of understanding and our current inability to prepare for adaptation to

climate change, including the associated extremes. From global to national/country and local communities' levels, public and private sector institutions are seeking the tools and the knowledge for climate risk management. Similarly, national governments and decision/policy-makers at regional and local communities' levels are asking how they can better manage climate-related risks and opportunities. Demand for useful knowledge and information is increasing. Managing climate-sensitive sectors is enhanced through access to critical climate information from the past and the present, and through anticipation of future climate. Integration of climate information into decision-making in all sectors of society would foster more effective climate risk management strategies in support of the achievement of economic and development objectives, including the Millennium Development Goals (MDGs). In addition, climate monitoring information and global-scale seasonal to inter-annual climate forecasts are produced at several centers.

The knowledge and tools thus available need to be adapted, improved and made available at the regional to national/country and local communities scale where needed to optimize available options for climate risk management, adaptation to climate change, disaster risk reduction, sustainable development and sustainability. The ability to effectively predict changes in the climate on the time scale of a few years to several decades would have a profound effect on how we manage our lives. Scientific advances in seasonal to multi-decadal prediction, increasing political sensitivity and the awareness of a wide range of user communities of their vulnerability to climate variability and change make it essential to strengthen the provision of pertinent, tailored climate information to all user communities. The challenge with regard to the provision of adequate and timely climate information and its appropriate use is twofold: 1) developing and enhancing systems for production and delivery of useable climate information, spanning global to local scales, on various timescales, and 2) ensuring an effective delivery of information from providers and the uptake of the information by decision-makers in different sectors. A large proportion the PICTs population live in rural communities and dispersed over many islands and would need different sets of approaches to deliver climate services to them. The GFCS is therefore a long-term cooperative arrangement through which countries including PICTs and various international, regional and national institutions together with stakeholders will work together to achieve the above. WMO has been making concerted efforts to establish Regional Climate Centres (RCCs), in close coordination with its Regional Associations, Commission for Climatology (CCI) and Commission for Basic Systems (CBS). The WMO community has strongly endorsed the concept of the RCCs, and has committed to their establishment in close compliance with the applicable WMO Technical Regulations, as per the Manual on the Global Data Processing and Forecasting System (GDPFS), (WMO NO. 485). But a RCC is yet to be established in the Pacific.

6.3. Hydrological services

Some PICTs including Fiji, Papua New Guinea, Samoa, Solomon Islands and Vanuatu are often subjected to frequent flooding which severely impacts local communities. Recent floods in Fiji in 2009, 2012, and in Samoa 2013, resulted in the declaration of States of Emergency and States of Disasters, and caused extensive damage and hardship to communities. At the moment, these countries are providing flood forecasting information only but with no clear legislative or policy guidance for any agency to issue flood warnings. It is important that legislative and policy changes are introduced to better coordinate existing and/or establish new warning system for flood warnings. Additionally, there is a serious lack of support to ensure data collection, data management and delivery of adequate forecasts and warnings of floods. Furthermore, there is a serious lack of individual and institutional capacity to analyze weather data for flood forecasting and warning and for designing appropriate policy intervention. This problem needs to be addressed through capacity training of staff in hydrological science, use of hydrological and meteorological equipment and analytical interpretation. Flood forecasting and warning early system is an intricate part of the disaster preparedness and recovery. This is a priority outcome 5 of the PIMS.

All PICTs are subject to periods of low rainfall which can severely impact on communities and their livelihoods. Recent drought events in Kiribati, and Tuvalu in 2011, and Republic of Marshall Islands in 2013, resulted in the declaration of States of Emergency and States of Disasters, and caused extensive damage and hardship to communities. Water is at the top of the list of concerns for the PICTs' communities, where water security is fundamental to the survival of the PICTs' populations. In the majority of the PICTs, national government activity in the water sector is primarily confined to supplying the domestic and potable water needs to communities. Resources, skills and institutional frameworks to respond to additional demands outside of this core activity are often limited. Furthermore, there is a lack of support to ensure data collection, data management and the delivery of adequate forecasts and warnings of droughts. There is a need to ensure that during droughts the essential information is available to help in the response, and that dedicated teams are able to be mobilized to collect and provide the relevant information if necessary. Drought prediction and warning system is an intricate part of the disaster preparedness and recovery.

6.4. Meteorological information for mariners

Currently, the PICTs' NMSs are providing weather forecasts including warnings for mariners, based on land-based meteorological and satellite-based meteorological and oceanographic data. The current regional marine and ocean monitoring system in place can only provide regional projections of ocean currents and waves, sea surface wind speed and direction, and wave height at a regional scale. This current system does not account for localized changes of marine and ocean patterns that may impact local safety such as the recent incident in Papua New Guinea. In 2011, a vessel wrecking in high winds and heavy seas resulted in more than 200 lives lost. This localized change in ocean pattern could not be captured by the data extrapolated from the regional marine and ocean monitoring system. There is a lack of ocean-based or near-coastlines data in the vast oceans between the PICTs and among individual islands within a PICT. Improving the coverage of ocean-based and near-coastlines data will in turn improve weather forecasts and warnings for mariners. The PICTs are surrounded and at the same time isolated from one another by vast areas of ocean. Furthermore, in most PICTs, individual islands are distanced by stretches of seas. Trade is the growth engine for most PICTs' economies. However, access to goods and services within each PICT and with neighboring developed countries such Australia and New Zealand also requires shipping transport and infrastructure to move goods and people around. Marine transport infrastructure is highly vulnerable to weather related extreme events. Disruption to the supply, transport and distribution chains upon which trade depends, raises costs. All types of shipping vessels, from the biggest cargo/tourist/fuel boats/tankers to the smallest recreational boats, are highly vulnerable to weather and oceanic natural hazards such as strong winds, high waves and poor visibility.

6.5. Weather and climate data station and networks

Each PICT has set-up observing stations for recording weather and climate data. These stations and its equipments are in need of urgent upgrading. Examples include wind anemometers, air and ground soil thermometers, wind profilers, etc. As a way of expanding scale of observation on land, it is important to include local communities with ownership rights to land that are suitable for placing weather and climate data stations. As a way forward, the PICTs' NMSs will include local communities and schools for their Weather and Climate Monitoring Programmes. Equipment

Calibration Centre will need to be introduced as a cleaning house mechanism for weather and climate data. This Centre will be responsible for regular equipment calibration (improve data accuracy) and storing of spare parts for maintenance purposes. All the PICTs have established national weather and climate data networks that are participating in regional networks such as Regional Basic Synoptic (Weather) Network (RBSN), Regional Basic Climate Network (RBCN), Lighting Detection Systems Network, and the Regional Global Climate Observing System Network. These networks are extensive and are proven effective in disseminating weather and climate data among the PICTs and to other countries outside the region. However, national weather and climate data network systems are incompatible with global and regional network systems. This is problematic because it does not allow the PICTs data to be absorbed into global and regional databases for wider dissemination. The establishment of Reference Stations in the Pacific would improve the data quality collected in the Pacific. A wind profiler network for the PICTs has been noted as a requirement that would assist the NMSs. The imperative now is to assist the PICTs to procure and install software and hardware systems that are compatible with global and regional networks.

6.6. Socio-economic studies of weather and climate services/information

The PICTs' NMSs are providing weather forecasts including warnings to communities. In addition, they are providing climate information to focused-groupings in the agriculture, health, and water sectors. For example, in the Solomon Islands and Samoa, works are underway to use seasonal climate predictions to inform decision-making in the health sector and renewable sector respectively. While these have been going on for many years, there have been no detailed studies of the value of weather and climate services/information for the socio-economic benefit of the PICTs. As a result, it is difficult to integrate weather and climate criteria into national policy frameworks and budgeting processes. The socio-economic value of meteorological services in the PICTs are rarely appreciated and quantified in terms of benefits derived and losses foregone. By carrying out socio-economic studies in each PICT the true value of meteorological services can be assessed and evaluated including its contributions to all sectors of the economy. The PMC in collaboration with the PICTs will conduct these studies and work with each country to mainstream the findings into national policy frameworks and budgeting processes.

6.7. Monitoring and evaluation of the Pacific Island Meteorological Strategy 2012-2021.

The Monitoring and Evaluation (M&E) Framework of the Pacific Island Meteorological Strategy (PIMS) 2012-2021 is in place. However, due to limited finances, the PMC and the SPREP Secretariat (PMC secretariat) are unable to perform the M&E of the progress of the Strategy. It is for this reason alone that additional resources are required to complete the full suite of M&E activities in-order to report on the effectiveness and efficiency of meteorological developments in the Pacific region.

Component 2: National Meteorological Services Legislation, Policy, Coordination and Strategy Plans

6.8. Meteorological services legislations

The PICTs have various forms of legislating meteorological services in-country. With the exception of the Solomon Islands and Vanuatu who have designated laws specifically for Meteorological Service, other PICTs have opted to absorb Meteorological Services under pre-existing laws such as the case in Fiji (under the Civil Aviation Act). Notwithstanding, the existing arrangements do not cover the expanding portfolio of responsibilities in the NMSs. More recently, disaster risk reduction and disaster risk management, climate change and flood warnings have been added as extra functions to the NMSs. Additionally the need to ensure the NMSs are able to meet legal commitments for the provision of services puts them in a position of potential liability. This has provided the impetus for reviewing current legislation including the possibility of developing new laws specifically for the NMSs.

6.9. Meteorological services policies

The PICTs' NMSs have very limited experience in formulating appropriate meteorological policies. A significant role of the NMSs is to provide accurate advice for upfront planning by sectors to address weather and climate impacts. The interface between weather, climate and water science and policy needs to be strengthened by training the NMSs personnel to be competent in collecting, analyzing, interpreting and designing of suitable meteorological policies to inform response by other sectors. The policies will include coordination with other economic sectors such as civil aviation and ports departments/authorities.

6.10. Institutional coordination

Several PICTs' NMSs continue to suffer from weak institutional coordination, primarily between central agencies and line ministries. Streamlining coordination is essential for producing meteorological policies and implementing them. Therefore, it is important to first, assess the current coordination frameworks and arrangements for higher engagement of the NMSs in service delivery followed by rapid implementation of these assessments' findings.

6.11. National Meteorological Services strategic plans

The development of national meteorological strategies are important to link the activities carried out by the PICTs NMSs to the PIMS, the WMO RA V (South-West Pacific) Strategy and the WMO Global Strategy while also linking these activities to the overarching national plans. This gives ownership and visibility at the national level where national governing institutions are able to promote these priorities for bi-lateral funding. Each PICT at varying level of development and would have differentiated levels of priorities. Vanuatu Meteorological Service and the Kiribati Meteorological Services serve as examples of how valuable these strategies have guided the development of the NMSs at the national level.

Component 3: Institutional Capacity of the Pacific Meteorological Desk Partnership

The goal of the PMDP is to *improve regional coordination and advancing and sustaining the delivery of weather, climate and related services* for the protection of life and property of Pacific island communities. The PMDP is serving as the regional weather and climate services coordination mechanism managed by the SPREP Secretariat to deliver a regionally coordinated effort to service SPREP Members needs in the area of weather and climate services. It requires continuous support for dedicated staff to manage, coordinate and implement the different priority areas. The current staff include the Meteorology and Climatology Advisor (currently funded by Commonwealth Secretariat and the contract expire in 2014), the Meteorology and Climatology Officer (3 year contract and is a core funded position), the PI-GOOS Officer, and the PI-GCOS Officer position (which is still vacant from 2012 but will hopefully be filled by the end of 2013). The operational budget for the PMDP will need further support to allow the implementation of some of the PIMS's key regional actions as required from the PMDP.

Component 4: Capacity Development

The capacity gaps identified in the abovementioned Institutional Assessment Report will serve as the basis for developing its Action Plan. This Capacity Development Action Plan will include a menu of activities that are required to strengthen the NMSs capacity.

7.0. Way Forward: Key Steps

Before the end of this 2013 PMC/Donors Roundtable, we will need to agree on the following key steps for fast tracking our progress towards developing project proposals for funding considerations by our donors and development partners. These are:

1. The Pacific Meteorological Desk Partnership (within the SPREP Secretariat) to work with PMC members, development Partners and Donors
2. Develop and circulate aide-memoirs as the true minutes of the meeting to reflect the key discussions made and develop a follow-up schedule with each Donors after the meeting
3. Involve the chair, vice-chair and Partners of PMC to follow up the project concepts with Donors after the Donor Roundtable meeting
4. Develop proposals for the PICTs NMSs considerations and endorsement.
5. Invite Letter of Endorsements from the PICTs NMSs interested to participate in the project proposal(s).
6. Joint-Submission (the PMC) of Project Proposals to donors and development partners.
7. Review of Project Proposal and Addressing of Comments.
8. Resubmit revised project proposal for approval.
9. Project proposal is approved and funds awarded are made available.
10. Set up Project Management Units (involve recruitment of project staff)
11. Implement Project Activities.
12. Monitor and Evaluate Project Results.
13. Report on projects to the PMC.
14. Final Project Review for closure.

END