



26th UNESCO-IHP Regional Steering Committee

Meeting for Asia and the Pacific

In association with

Catalogue of Hydrological Analysis Workshop

3-5 November 2018

Shanghai, China

Summary report on Pacific-SIDs Recent Progresses and Challenges in Water-related Disasters

Amini Loco

Geoscience Energy and Maritime Division

SPC

INTRODUCTION - THE PACIFIC SIDS UPDATE ON WATER-RELATED HAZARDS

The Pacific Islands – Small Islands Developing states (SIDs), are in need of support to establish appropriate technologies, compatible and accessible observation systems and to build adequate human and infrastructural capacity to help prepare and develop resilience in the disaster-prone region. Linked to the Sendai framework for Disaster Risk Reduction 2015 – 2030 and the Framework for Resilience Development in the Pacific 2017 – 2030, widespread institutional progress has been made to minimise the frequent and severe impacts of water-related hazards, namely flooding, droughts and tidal inundation related to tropical cyclones. The role of national hydrology (NH) and meteorology services (MS) is central for the prediction, early warning, and responses associated with these disasters, and thus require huge support. Key progresses and achievements in NHMS sector, to date is the formation of the Pacific Meteorological Council (PMC), which has a number of panel or key areas, including the recently endorsed Hydrological Services Panel. These progress is a mark of commitment from Pacific Island Government and the support from regional organisations such as SPREP, SPC, USP and WMO.

This report will summarise the progresses, challenges and suggested improvements surrounding hydrology and meteorological services around Pacific-SIDs. This will also extend in to a brief look at the Pacific context and governance and institutional arrangement around the regional NHMS.

PACIFIC SIDS – CONTEXT

The Pacific region (Figure 1 below) is characterised by an extensive ocean that accommodates relatively small-sized islands, having low population in communities or extremely highly-population urban centres and are run by self-governing bodies, be it community, island or local, and national levels. The physical conditions of these islands range from low lying carbonate islands or atolls such as Kiribati and Marshall Islands, raised limestone islands such as Niue and high volcanic islands such as Vanuatu, Solomon and Fiji.

Surrounded by vast ocean, the Pacific climatic and weather conditions are strongly influenced by the ENSO conditions and hence is vulnerable to frequent and severe climatic extremes, such as prolong dry periods, and torrential rainfall and strong winds. These recurring water-related conditions created havoc, in small islands conditions through droughts and intense flooding which usually are huge setback to the economic and infrastructural development in the region. This is very well recorded by the severe TC Pam in 2015, TC Winston in 2016, TC Gita in 2018 couples with the severe drought that had devastating effects the region between 1997 and 1998, and the many other recorded dry events that followed. Not limited to these, the Pacific is also vulnerable to tidal inundation and landslides and salinization of freshwater resources, induced by climate extremes.

Further, ability of the Pacific governments to withstand or reduce the impacts of these water-related conditions is often worsened by the lack of capacity in NHMS to properly monitor water resources and rainfall to provide reliable prediction and adequate warning. These are coupled with poor monitoring infrastructure and lack of policies and/or enablers to allow coordination between NH and MS and to foster data sharing and collaboration.

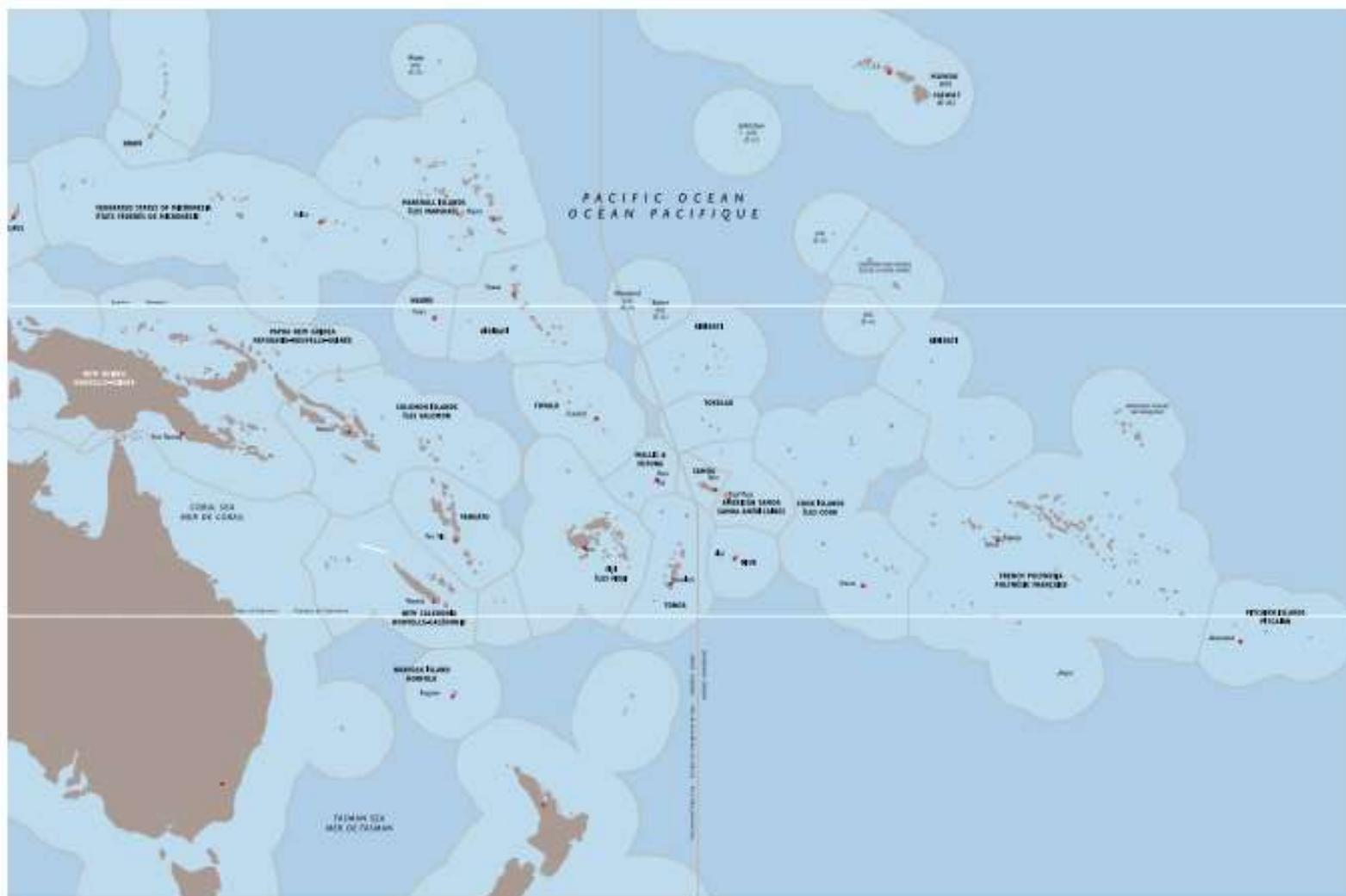
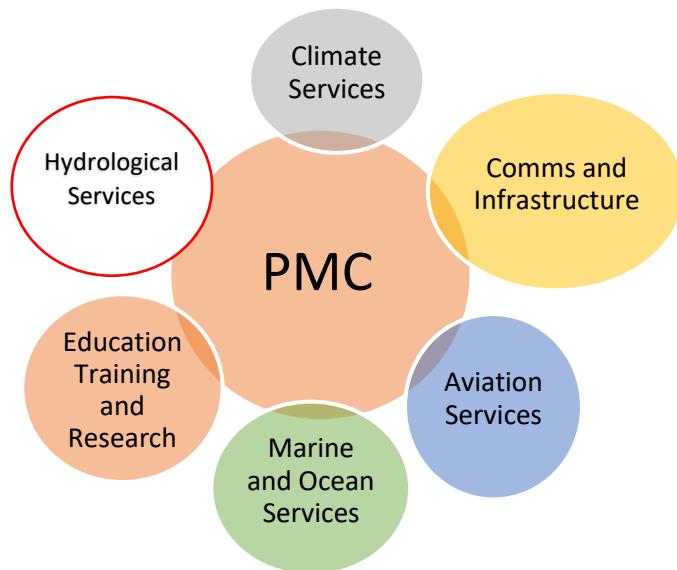


Figure 1. the extensive nature of the Pacific-SIDs, their remoteness and small sizes make them vulnerable to extreme water-related weather conditions and disasters (Source. Framework for Resilience Development in the Pacific, 2016)

GOVERNANCE & INSTITUTIONAL ARRANGEMENTS

Under the auspices of the PICT's ministerial declaration in 2015 and 2017, the support by SPREP, SPC, USP and WMO is critical to improve NH and MS was paramount for water resources management, sound early warning systems and disaster reduction. This resulted in the formation of the Pacific Meteorological Council (PMC) in Marshall Islands in 2011. The PMC, now a specialised body of SPREP and strongly supported by SPC, WMO and USP, was established to provide scientific and technical support and coordination in NHMS space.

Currently the PMC has 6 technical areas, namely climate services, communication and infrastructure, ocean and marine services, aviation services, educations, training and research and hydrological services.



Critical to the governance mechanisms and worthy to emphasise is that the Pacific Hydrological Services Panel (HSP) was recently incorporated and endorsed in December, 2017 to support delivery and coordination of meteorological and hydrological priorities stipulated in the Pacific Island Meteorological Strategy 2017-2026. Following this endorsement, a TOR for the HSP was developed focusing on the following area:

- To establish links and improve coordination between the PMC and international and regional organizations with an interest in hydrological services. [This would include, but not be limited to: WMO, UNESCO-IHP, International Association of Hydrological Sciences (IAHS), International Association of Hydrogeologists (IAH), International Groundwater Resources Assessment Centre (IGRAC), PIFS, SPREP, USP, SPC, CSIRO, Geosciences Australia, NIWA, NOAA, USGS]
- To provide guidance on the design and scope of current and future programmes that support hydrological services at the community, national and regional levels;
- To work with partners, including the WMO RA V Working Group for Hydrology, to progress the development and implementation of new programmes and initiatives to address identified gaps in PICTs capacity to provide quality hydrological services relevant to Pacific island environments and circumstances.

MAJOR CHALLENGES

Although the recent progress and commitment from Pacific island leaders and the establishment of key technical groups and support from regional partners, is it critical to understand the number of fundermantle challenges prevalent in the region and required immediate attention. These include, but not limited to:

1. Lack of coordination between NH and MS to undertake periodical monitoring and data sharing;
2. Lack of capacity to confidently design monitoring programs and lack of long-term data to undertake modelling ;
3. Lack of resources within government to be mobilised for NHMS data collection during disaster periods;
4. Lack of joint initiatives and opportunities for capacity building within the NHMS;
5. Lack of infrastructural and telecommunication; and
6. Inadequate forecasting system to predict and warn potentially vulnerable communities of looming disasters for appropriate response and/or actions.

ACTIVITIES AND PROGRESSES IN WATER-RELATED DISASTER SPACE.

1. A UNESCO IHP work plan meeting was undertaken in Nadi, in November 2017
2. JICA supported DRM work in the Solomon Islands where one of its major rivers is currently equipped with monitoring and telemetered stations – this is possible pilot for Catalogue of Hydrology Analysis publication.
3. Partnership between Fiji NHMS with SPC to undertake peak flood flow estimation after TC Josie early in the year – the approach used was the slope area methods where R10 Survey grade GPS was used to capture elevation of high flood mark.
4. The partnership between India, UNDP and SPC that enabled the training of 17 participants from 9 countries at the Roorkee National Hydrological Institute, in July 2018.
5. A Pacific Hydrology Panel meeting was undertaken in August, 2018 in partnership with the New Zealand funded Water Security project – the meeting resulted in the panel members workshopping the Pacific IHP work plan with key country needs and actions established.
6. Numerous early warning and early action initiatives, including the training on TB3 rain-gauges installation and data collection and analysys around the region
7. Groundwater investigation in a number of countries in response to drought and cyclone disasters where new and/or alternative groundwater sources were identified through the use of electrical resistivity geophysics.

SUGGESTED WAY FORWARD:

The Pacific Hydrological Panel, during its regional meeting in Nadi, Fiji Islands in August, 2018 has agreed on a work plan towards achieving the goals of the Pacific Key Outcome 7 which is “Strengthen collaboration between meteorological and hydrological services in order to better manage water resources and reduce the impact of water related hazards”. High level actions identified going forward include:

1. Identifying and quantifying impacts of climate variability and climate change to water resources

2. Identify and pursue joint opportunities NH and MS for the improved collection, management and use of hydrometric and meteorological data to support priority data needs.
3. Identify and implement opportunities to strengthen the capacity of hydrological and meteorological services.
4. Improved hydrological infrastructure, communications and forecasting systems to support hydrological services

Key to these actions are following needs:

- Having Pacific centered approach that considers downscaling climate and rainfall models to meet PICT's needs and diversity
- Understanding the existing capacity in terms of skill sets, training and technological needs to properly and sustainably support NH and MS
- Establishing enabling environment between NH and MS to review and determine what the technological and instrumentation needs are, improve monitoring networks, ensure data compatibility and data dissemination
- Linking with WMO RAV training networks and establishing links with international institutions that provide appropriate trainings to meet in-country and Pacific needs and to build and sustain in-country or regional capacities for sound hydrological services
- Adequate investment and research efforts on flood management and drought management around improved catchment characterisations, establishing of appropriate early warning systems and trigger levels for response and understanding community alert levels and response.
- Effective and targeted communication and early warnings to the public is required.

These improvements are very well reflected in the concept of a Hydrological Observation System Phase 2, which the following goals:

- Develop regional hydrological skills and capacity - focus on leadership, and skills in data analysis, interpretation and data presentation – GIS
- Improve database management and data confidence
- Support development of flash flood warning and groundwater management products and technologies

It is critical that a multi-hazard approach, including a catalogue of methods, can be considered to capture, accommodate, and address the range the water-related hazards prevalent in the region.