



# FIJI METEOROLOGICAL SERVICE COUNTRY REPORT

Reporting on National Priority Actions of the Pacific Islands Meteorological  
Strategy (PIMS) 2012-2021

This Report is presented to the Fourth Pacific Meteorological Council (PMC-4) Meeting held in Honiara from 14-18 August 2017

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The report is structured to allow the PMC secretariat to capture the Progress of against the National Priority Actions of the 14 Pacific Key Outcomes (PKO's) of the Pacific Islands Meteorological Strategy (PIMS) 2012-2021 which will be under review at this meeting. This report will contribute to the following:

- i. monitoring the progress of each NMSHs against the implementation of the PIMS;
- ii. inform the Work Program of the Pacific Met Desk Partnership (PMDP); and
- iii. identify gaps and needs some of which will be packaged for projects and presented to the Donors and Partners

Information in this report will be made available on request by donors and partners unless indicated otherwise by the NMHSs directors.

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## 1.0 Summary

Fiji Meteorological Service is now aligned to a new Ministry of Disaster Management and Meteorological Service. On 29<sup>th</sup> June 2017, the Minister of Economy announced the Ministry of Disaster Management and Meteorological Service. This is to better integrate the services that support disaster preparedness, response and recovery to natural disasters. The effects of climate change and severe weather events are becoming frequent and more severe.

In light of the above, the Ministry is formed to work seamlessly to coordinate emergency response operations in the aftermath of a disaster. This is to improve Fiji's resilience to natural disasters and other severe effects of climate change. Under the Meteorology Portfolio, the ministry will provide timely and reliable weather, hydrology and climate information directly to the public to improve overall preparedness before a disaster strikes.

FMS manages its operations both the national and regional with had 127 staff and has re-organized its structure to cater for the changing scope of meteorology in light of International conventions of Paris Agreement, Sendai Framework for Disaster Risk Reduction and Sustainable Development Goals.

We have introduced new capabilities within FMS such as media centre to enhance visibility of FMS, Business development unit and new weather office for Vanua Levu to cater for growing demands for decentralization of services to outer islands and rural population. To meet the requirements of ICAO and CAAF, FMS will now create a standalone aviation unit to better serve the industry and the airlines in ensuring aircrafts flying in the Fiji Airspace are safe.

To deliver the services effectively, the government of Fiji has strengthened the workforce of FMS by establishing 16 new positions and allocating funding in the 2017/18 financial year. The new position covers for an Assistant Director, 4 Senior Scientific Officer, Instrument Technician, QMS Officer, among other corporate and Government wage Earners. This ensures a better and sustained service to our regional countries and Regional Specialized Meteorological Centre and training functions.

FMS will continue to pursue to finalize the SDP and cabinet approval of Meteorology and hydrology Act which is currently before the Parliament Standing Committee for Natural Resources. Once this achieved, FMS will revisit its vision, mission and objectives to align with the act.

Qualification for the staff shows that a majority of the staff in the forecasting Divisions holds the Basic Instruction Package for Meteorological Technician (QI) followed by Senior Observer Technician. All the forecaster have already completed the Meteorologist course (WMO class 1) and have undergone competency assessments.

A sustained FMS budget of over \$8 million dollars has been for last 3 years and expected to further increase in the coming years. With the Business Development Unit in place, revenue generated will further boost FMS investment in meteorological and hydrological infrastructure and services being modernized in the coming years. The vision is to become a world class organization.

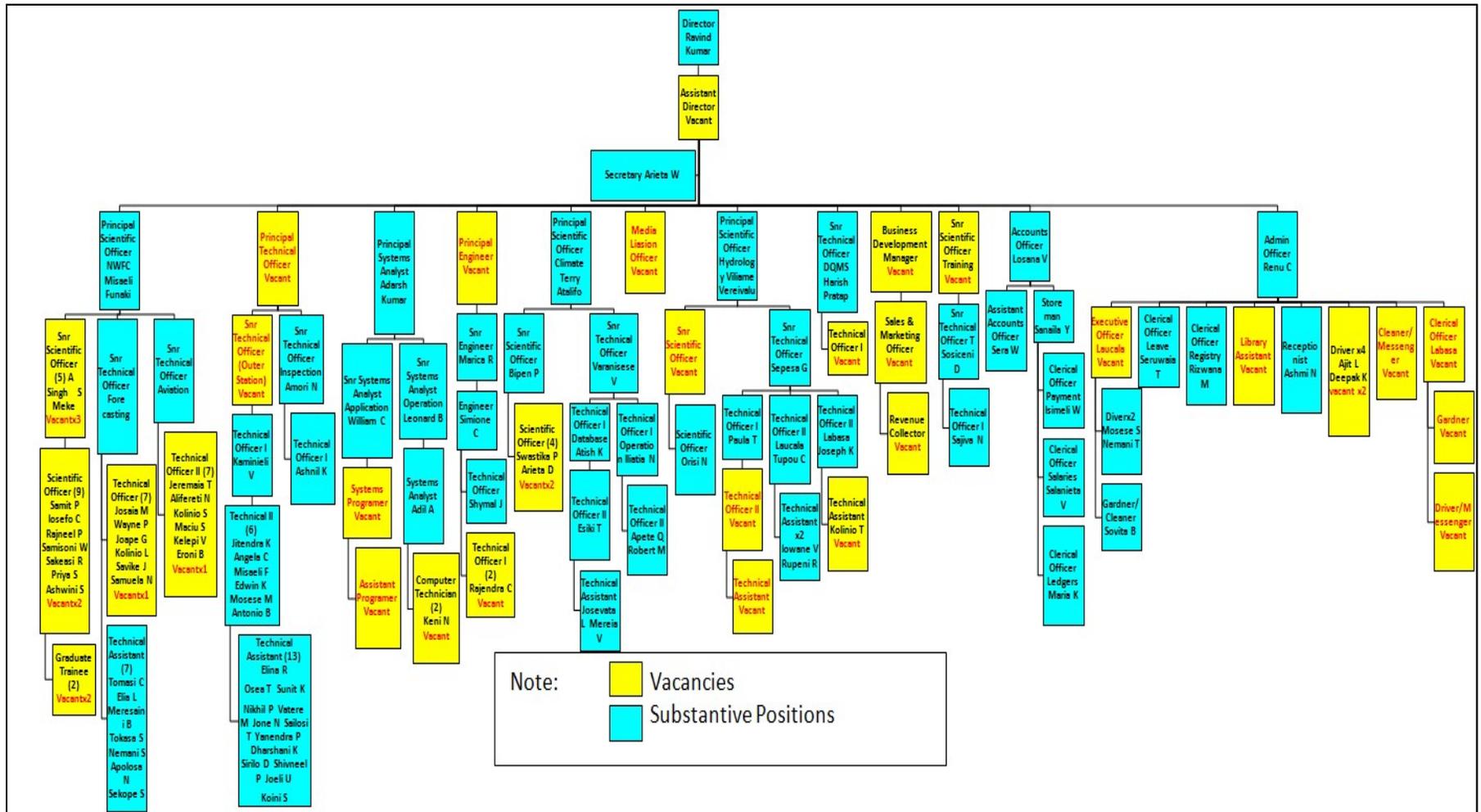
I am happy to report that FMS has been provisionally certified by CAAF to be the Aviation Meteorological Service provider for air navigation and Climate Service is ISO 9001:2008 certified. FMS is on its journey to Marine services certification and its Public Weather service certified by 2019. FMs will also embark towards certification of ISO 17025 in compliance to establishing a regional Instrument Calibration Centre by 2020.

For the past three years, FMS has been participating in the Fiji Business Excellence Awards and have been recognized with PRIZE award in 2014, 2015 and 2016. The journey to excellence has grown FMS to achieving high standards of service and we will continue to build upon these achievements.

FMS recognizes its prosperity lies with the capacity and capability of their staff and will continue with capacity building initiatives within the FMS staff is one of main priority and further improve the quality of the product and service provided to our customers and the regional countries. In this regard, FMS will develop new training courses based on the needs of the region, explore the possibility of establishing the Regional Training Centre with collaboration with USP, WMO, SPREP and affiliated Universities. Furthermore, FMS will meet the requirements of WMO to host regional Instrument Calibration in collaboration with the President and the Management Group of RA V in coordination with CIMO and relevant departments of WMO Secretariat.

## 2.0 Background Information

### 2.1 Institutional Setup



Note:  Vacancies  
 Substantive Positions

<b>Governance</b>	<b>Description</b>
MET LEGISLATION: Update on whether or not your country have a stand-alone Meteorology Act or equivalent or is it part of other government's legislations to guide the NMHS to perform its role and responsibility? Briefly describe it.	The draft Meteorology and Hydrology Act was submitted to our Permanent Secretary for onward submission to Cabinet last year but nothing has been finalized till todate.
Do you require for your Act to be reviewed? If it is already reviewed, what is the current status of your Act	Nothing has been finalized todate on our Meteorology and Hydrology Act
<b>Strategic Planning</b>	
Describe how meteorology (weather) and climatology (climate variability and climate change) are featured in the current national development plan, government ministries corporate and implementation/operational plans.	Our core role and key priority is to address relevant Key Pillars of the People's Charter for Change, Peace and Progress (PCCPP) and the Fiji Bill of Rights found in the 2013 Fiji Constitution. Therefore we will focus on minimising the negative impact of natural disasters and climate change to societies and communities through better quality weather forecasting, climate and hydrological services. This links with the RAV operating plan and WMO Strategic Plan. FMS is well positioned with WMO as a Pacific member on the Executive Council and focal point of IPCC.
Describe the process if your NMHSs is reporting against the SDG or its national equivalent.	The weather and climate cross cuts all sectors of economy and affects flora and fauna in multiple ways. Therefore, FMS contributes to all the SDG's in one way or the other and specifically to SDG 1,2,3,6.7.8.9.13, 14 and 15.
Does your NMHS have a strategic plan, implementation/operational plan or equivalent(s)?	The strategic Development Plan is under development with the assistance from WMO and Dr Geoff Love (consultant). A final draft has been produced and currently awaiting SDP of the Ministry of Disaster Management and Meteorological Service. Once the final version of SDP available, it will undergo consultations with key stakeholders before approval from government is sought. The operation plan is developed through the Annual Corporate Plan and Business plan.
Describe how meteorology (weather), climatology (climate variability and climate change), disaster management and early warning systems are feature in your NMHS strategic plan, implementation/operational plan or equivalent(s).	Our Strategic plan will align with the Ministry of Disaster Management and Meteorological Service and also align with the with the work and objectives of the Pacific Islands Meteorology Strategy (PIMS) 2012-2021 and proposed PIMS for 2017-2026 and its also align with those found in the WMO Strategic Plan 2016-2019.

## 2.2 Staffing

### 2.2.1 Staff Qualification

Fiji Meteorological and Hydrological Services does not have its own human resources development strategy but was just part of the previous Ministry's human resources development strategy. With the new Ministry, FMS will develop a human resources development strategy for both the National Disaster Management and Fiji Meteorological Service. FMS continues to develop its human capital through upgrade of qualifications and also at entry level.

Staff	Qualification	Division/Section	No. Professional Staff		Total
<i>Staff Name</i>	<i>(Description the qualification under each division) Example; WMO Class 1-4 or other qualification or professional training, education and research)</i>	<i>Responsibility of Staff (Forecast, Climate, Observation, Administration, etc)</i>	<i>Male</i>	<i>Female</i>	<i>Total Number of Staff</i>
Ravind Kumar	Master Degree Environmental Science (Climate Variability and Climate Change – USP MSc Gold Medalist, 2015)	Cooperate Services	3	1	4
Renu Yogita Chand	Public Administration	Cooperate Services			
William Cati and Terry Atalifo	Business Administration	IT and Climate			
Viliame V	Disaster Management (Flood Hazard)	Hydrology			
Rajneel Suvendra Prasad	Science (Physics),	Weather Forecasting			
Ravind Kumar Rajneel Suvendra Prasad	Post Graduate Diploma in Geography PG Diploma in Physics	Cooperate Services Weather Forecasting	3	1	4
Priya Singh and Bipendra Prakash	PG Dip in Climate Change,	Weather Forecasting and Climate			
Amit Singh	Mathematics	Climate Weather Forecasting			

Misaeli Funaki, Amit Singh, Stephen Meke, Sakeasi Rabitu, Samisoni Waqavakatoga, Rajneel Prasad, Samit Prasad, Ashwini Sharma, Iosefo C and Terry Atalifo	Graduate Diploma in Meteorology WMO Class I	Forecasting, Climatology,	9	1	10
Sakeasi Rabitu, William Cati, Terry Atalifo	Post Graduate Certificate: Meteorology, Business Administration, Human Resources Management	Forecasting, IT,	3	0	3.
Misaeli Funaki, Amit Singh, Stephen Meke, Sakeasi Rabitu, Samisoni Waqavakatoga, Rajneel Prasad, Samit Prasad, Iosefo C, Terry Atalifo, Shivneel, Viliame Vereivalu, Orisi Naba & Ashwini Sharma and Priya Singh	Bachelor Degree: (Maths and Physics)	Weather Forecasting, and Hydrology,	12	10	12
Ravind Kumar, Bipen Prakash, Arieta Daphne, Swastika Devi, Koini Saucake,	Atmosphere and Ocean Science, (Environmental Science),	Climate	0	1	1
Renu Yogita Chand,	Bachelor Human Resources	Corporate Services	2	4	6
Maciu Saukuru,	Bachelor of Commerce,		0	1	1
Adarsh Kumar, William Cati, Adil Ali,	Information Technology	IT	1	0	1
Marica Ratuki and Simione Civoniceva,	Electrical Engineering Technology	Technical System	3	0	3
			1	1	2
Ravind K, Sosiceni D, Sajjiva S, Harish P, Kaminieli V, Amori N, Ashnil K, Jitendra K, Angela C, Misaeli F, Edwin K, Mosese M, Atonio B, Elina R, Tomasi C, Josevata L, Namish N, Vatore V, Jone N, Mereseini T, Drashani K, Joeli U, Apolosa N, Sunit K, Koini S, Shivneel, Jaydip, Mereia, Osea,	Basic Instruction Package for Meteorological Technician (BIP-MT) (QII)	Forecasting, Climate, Training, Reporting & Facilities,	42	7	49

Charlie J, Narend K, Josaia M, Wayne P, Joape V, Kolinio V, Joji S, Samuela N, Jeremaia T, Alifereti N, Kolinio S, Maciu S, Kelepi V, Eroni B, Elia L, Tokasa L, Nemani S, Robert M, Ilaitia N, Apete Q, Tupou C					
Ravind K, Sosiceni D, Sajiva N, Harish P, Kaminieli V, Amori N, Jitend K, Angela C, Misaeli F, Edwin K, Mosese M, Atonio B, Vatare V, Elina R, Charlie J, Narend K, Josaia M, Wayne P, Joape V, Kolinio L, Joji S, Samuela N, Jeremaia S, Alifereti N, Kolinio S, Maciu S, Eroni B, Kelepi V, Varanisese V, Atish K, Ilaitia N, Apete Q, Esiki T,	Pacific Island Senior Observer Course (QI):	Cooperate Service, Forecasting, Report and Facilities', Climate	30	3	33
Losana V, Sera W, Maria K, Renu C, Arieta W, Seruwaia T, Salanieta V, Sosiceni D, Harish P, Amori N, Kamnieli V, Atonio B, Namish N, Jone N, Apolosa N, Sunit K, Koini S, Kolinio L, Samuela N, Kolinio S, Kelepi V, Mereseini T, Keni N, Rajen K, Varanisese V, Ilaitia N,	Diploma : Business Accounting, Frontline Management, Management, Secretarial studies, Information Technology, Quality Management, Mechanical Engineering, Plant Engineering, Electronic Engineering, Agriculture, Environmental Science, Communication in Business and Management, Industrial Lab Technology, etc.	Cooperate Services, Report & Facilities, Forecasting, Climate, Technical System, IT	16	10	26
Maria K, Arieta W, Rizwana M, Sosiceni D, Sajiva N, Ashnil K, Edwin K, Osea T, Charlie J, Narend K, Wayne P, Kolinio S, Apete Q, Sepesa G, Paula T, Joseph K, , Rupeni R, Iowane V,	Certificate level courses Basic skills in library Secretarial Studies, IV for IT support, IV training and assessment, Electrical IV in Meteorology, Electronics, etc.	Cooperate Service, Climate, Forecasting, Hydrology, Technical system, IT, Training, Reporting & Facilities	15	3	18

## 2.3 Finance

The financial support provided for the operating and capital works is summarized in the table below.

<b>Year</b>	<b>Operating</b>	<b>Capital</b>	<b>Total (Million)</b>
2014/15	\$5,355.6	\$2,973.7	\$8,309.3
2015/16	\$5,768	\$2,354	\$8,122
2016/17	\$6,091.4	\$5,376.3	\$11,467.7
2017/18	\$7,088.8	\$3,465.5	\$10,554.3

The other financial support was provided by JICA about \$1.140 million for “Reinforcing Meteorological functions, regional capacity building on Himawari Satellite of about \$185,900 over 2014 to 2017 and \$5.3 million for disaster risk reduction equipment in 2015. Other small expenses come from WMO and SPREP for hosting regional trainings, workshops and meetings.

It is noted that technology is changing at a faster rate than it can be replaced and this remains a challenge for FMS. The effects of natural disasters due to changing weather and climate patterns under the forcing of climate is the biggest challenge to meet the demands of our communities to keep them safe and secure. Therefore there is greater need for the upgrading of observational equipment, developing a high resolution NWP models for atmospheric and marine environments and up-skilling staff to meet these challengers. Exchange of knowledge and sharing of best practices is now inevitable to provide quality and timely early warning to prepare our communities to respond to these warnings. In this regard, substantial investment is needed to improve the service delivery.

### 2.3.1 Projects supporting the NMHSs

Name of Project (Financial Year) [Funded by]	Total Project Budget (Rounded to \$000)	Percentage of how much is provided to the NMHSs	Summary of NMHSs activities covered by the project
<b>Project 1-</b> Improvement of Equipment for Disaster Risk Management (2015) <b>[Government of Japan –JICA]</b>	\$5,300,000	100%	This was a 4 year project that began in 2011 with a survey by the Government of Japan to address high risk of natural disasters and reduce their effects in Fiji. The implementation of the project included: <ul style="list-style-type: none"> <li>• 5 VSAT stations</li> <li>• 4 lightning detectors</li> <li>• 1 tide gauge</li> <li>• 1 wind profiler</li> <li>• 1 AWS</li> </ul>
<b>Project 2:</b> Installation of Automatic Weather Station in Wainikoro, Seaqaqa, Saqani, Kubulau and Vaturekuka in Vanua Levu (2015) <b>[Government of Fiji – FMS]</b>	\$463,658	100%	The new Telemetry Automatic Weather Stations were to supplement availability of observational data from outer islands to prepare timely and up-to-date information on current and expected weather conditions for Fiji during severe weather for the safety and security of the people.
<b>Project 3:</b> Upgrade of the Nadi Radar Antenna (2016 – 2017) <b>[Government of Fiji – FMS]</b>	\$1,895,757	100%	This project is to replace the ageing antenna, pedestal, magnetron and radome components of the Nadi Radar which was installed in 1993.
<b>Project 4:</b> Upgrade of the Nadi Airport runway threshold Automatic Weather observation Stations (2016 – 2017) <b>[Government of Fiji – FMS]</b>	\$1,245,820	100%	This project is to replace the unserviceable equipment at the ends of the airport runway. This is to ensure aircrafts landing and taking off are safe by capture meteorological phenomena. Compliance to aviation services.

<p><b>Project 5:</b> Upgrading of Outer Island Station at Ono I Lau (2015)</p> <p>[Government of Fiji – FMS]</p>	\$150,000	100%	This project is to secure the FMS outer stations equipment and the FMS personal and families are well looked after while serving the country. The project looks into the viability of the existing synoptic and climate reporting network and its carrying capacity for the next 3-5 years.
<p><b>Project 6:</b> Construction of Archive Facility (2015-2016)</p> <p>[Government of Fiji – FMS]</p>	\$950,000	100%	To construct an international standard archiving facility for FMS for safe keeping of meteorological, climatological and hydrological historical data sheets, documents, charts etc.
<p><b>Project 7:</b> Construction of Labasa Weather Office (2016-2017)</p> <p>[Government of Fiji – FMS]</p>	\$1,250,000	100%	Expanding weather, climate and hydrological services to the Northern island of Vanua Levu and nearby smaller islands for the safety and security of the public. Project commenced late in February 2017 and expected to be completed in 2017.
<p><b>Project 8:</b> Rehabilitation of Vanuabalavu Met Station (2016-2017)</p> <p>[MFAT]</p>	\$1,000,000	100%	Tropical Cyclone Winston rehabilitation of Vanuabalavu Weather Office and staff residence funded by MFAT.
<p><b>Project 9:</b> Installation of Water Level and Rainfall Equipment (2015)</p> <p>[Government of Fiji – FMS]</p>	\$342,438.00	100%	Installation of Flood Warning Systems (FWS) in Ba River, Rewa River, Qawa River in Labasa, Wailotua and Toge stations.
<p><b>Project 10:</b> Installation of Water Level and Rainfall Equipment (2016-2017)</p> <p>[Government of Fiji – FMS]</p>	\$284,000	100%	Installation of Flood Warning Systems (FWS) at Naqali in Waidina River, Vatutu in Nawaka River, Semo River, FSC Mill at Ba River, Vatukoula at Nasivi River and Waikubukubu at Upper Nasivi River.
<p><b>Project 11:</b> Establishment of Media Centre (2016-2017)</p> <p>[Government of Fiji – FMS]</p>	\$50,000	100%	
<p><b>Project 12:</b> Coastal Inundation Demonstration Project – Fiji (Phase 2)</p>	\$800,000	80%	Installation of equipment, development of systems for wave, storm surge and run-up models and FWS system for Nadi River basin.

<b>Project 13:</b> Installation of Water Level and Rainfall Telemetry Equipment (2017-2018)  [Government of Fiji – FMS]	\$280,000	100%	Installation of Flood Warning Systems (FWS) in Nasekawa River, Wainibuke River, Ba River, Korovou River and Vitogo River.
<b>Project 14:</b> Installation of Automatic Weather Observing Station at Nausori Airport (2017-2018)  [Government of Fiji – FMS]	\$820,000	100%	This project is to replace the unserviceable equipment at the ends of the airport runway. This is to ensure aircrafts landing and taking off are safe by capture meteorological phenomena. Compliance to aviation services.
<b>Project 15:</b> Upgrading of Outer Island Stations (2017-2018)  [Government of Fiji – FMS]	\$200,000	100%	This project is to secure the FMS outer stations equipment and the FMS personal and families are well looked after while serving the country. The project looks into the viability of the existing synoptic and climate reporting network and its carrying capacity for the next 3-5 years.
<b>Project 16:</b> Climate and Ocean Support Program in the Pacific [DFAT]	Estimated over \$5,000,000	Unknown	Enhancing capabilities and capacities of NMHS in Climate and Ocean services
<b>Project 17: RESPAC Project:</b> [UNDP]	Estimated over \$3,000,000	Unknown	Enhancing capabilities and capacities of NMHS in Climate and Ocean services
<b>Project 18: FINPAC Project:</b> [FMI]	Estimated over \$5,000,000	Unknown	Enhancing capabilities and capacities of NMHS in Early warning and communications

### 2.3.2 Potential Collaboration on project proposals

1. Installation of Telemetered Automatic Weather Observing Station at Nabouwalu and Matei over 2018- 2019 financial year.
2. Installation of six (6) Flood Warning Systems over 2018-2019 financial year.
3. Upgrading of outer Island stations of over 2017-2019 Year.
4. Climate Risk Early Warning Systems (CREWS)
5. Canada CREWS
6. GCF Pacific SIDS Project
7. Others as they may evolve

## 2.4 Development

### 2.4.1 Buildings Infrastructure

Construction of New Archive Facility	
Construction of New Labasa Weather Office	

### 2.4.2 Update on Communications Infrastructure (to support current and future development)

	Details
What is the mode of communication for transmitting oceanographic and	The data is mostly transferred using various means: <ul style="list-style-type: none"><li>• HF Radio Telecommunications</li><li>• Telephone</li></ul>

hydro-meteorological data from remote stations?	<ul style="list-style-type: none"> <li>• Mobile</li> <li>• VSAT (Facsimile)</li> <li>• VSAT (Inmarsat)</li> <li>• VSAT (Internet)</li> </ul>
What is the Mode of transmitting data to the Global Data Network?	<ul style="list-style-type: none"> <li>• Aeronautical Fixed Telecommunications Network (AFTN) International Civil Aviation Organisation (ICAO)</li> <li>• World Meteorological Organisation (WMO) Global Telecommunications System (GTS) using 64K/16CIR Frame Relay</li> <li>• World Meteorological Organisation Information System (WIS) Portal (not used extensively)</li> </ul>
What is your Current Internet Speed, and is your main office connected to a secure national Government provided IT network (inbound and outbound)?	<p>Main internet speed is at 20mpbs and during severe weather the speed is increased to 50mpbs. Have dedicated FMS network with fully licensed security measures, unified firewall management, fully license cloud based mail and web security filtering using Forcepoint.</p> <p>The above provides security for all traffic (inbound and outbound)</p>
Does your NMHS have access to SATAID information?	Yes, we do and the IT is the focal point.
Which geostationary satellite(s) do you utilize, and which product(s) do you rely upon and how do you obtain it?	<ul style="list-style-type: none"> <li>• Himawari-8 Cloud data and Geostationary Environmental Operational Satellite (GOES) -15.</li> <li>• For Himawari-8 Cloud data we rely on Channels 3,5,7,8,13,15 through the internet.</li> <li>• For GOES-15 we rely on IR1,IR2,IR4 and WV (IR-Infrared/WV-Water Vapor) through Data Collection Ground-station Platform</li> </ul>
How many Upper Air Station does your NMHSs operate and what is their status? Do you have access to Lightning data, and do you use in your forecasts?	<ul style="list-style-type: none"> <li>• Nadi Operates 1 Upper Air Station</li> <li>• Disseminates data 00Z and 12Z UTC</li> <li>• Have 3 lightning data stations which we use for the adhoc inclement weather bulletin</li> </ul>

What is the scope and extent of marine weather services provided by your NMHSs and describes your NMHSs interaction with your national marine/port authorities and the marine user communities?

- The Fiji Meteorological Service (FMS) is responsible for providing weather and marine bulletins for ships on the high seas for tropical Southwest Pacific.
- The area so served is from **EQ to 25S between 160E and 120W**
- It fulfills these responsibilities by;
  - (a) broadcasting regular marine weather bulletins from Himatangi (NZ) for the area from 05N to 25S between 160E and 180, and from EQ to 25S between 180 and 120W; and
  - (b) providing advice for the eastern most portion of its allocated area on an individual basis on request.

**Services to Vessels in Local Waters**

- The Fiji Meteorological Service is responsible for providing weather and sea for all marine interests in the Fiji Group and Rotuma.
- By arrangement with the hydrographic unit, the Telecom Fiji Ltd. and the Fiji Broadcasting Commission, marine weather bulletins are broadcast at frequent intervals by
  - (a) Suva Radio: by radiotelephony.
  - (b) Radio Fiji: by radio in English, Fijian and Hindustani.
- FMS provides forecasts and warnings for local waters of certain other island groups. For convenience the marine and land interests are normally served in the same public weather bulletin.
- The island groups so served are:
  - Banaba
  - Cook Islands
  - Kiribati
  - Niue
  - Tokelau
  - Tuvalu
  - Nauru

What type of marine weather products, warnings, and advisories do you provide?

Marine weather products:  
High seas for Southwest Pacific

	<p>Marine Weather bulletin which includes: Wind strength and direction, State of the sea and swell and visibility</p> <p>Warnings: Gale/Storm/Hurricane warning for Tropical cyclone / Non Tropical cyclone Strong wind warning, Damaging Heavy Swell warning.</p>
Does your NMHS have a Port Meteorological Officer and are they involved in the WMO VOS Programme?	Currently No.

### 2.4.3 Training

The JICA project on “reinforcing meteorological training function of FMS is a JICA 4 year project aimed to enhance FMS capabilities and training in the Pacific region. This in turn builds capacities of regional countries

Training or Workshop Title attended by NMHS staff from 2015-2017	Start and End dates	Donor	Number of Participants from the NMHS
1. Customers Service- FMS	14 – 15/01/15	Fiji Public Service Commission (PSC)	3
2. Occupational Health Safety (OHS 1 & 2) – FNU	21 – 23/01/15	Ministry of Infrastructure & Transport (MoIT)	3
3. Calibration of Equipment - FMS	5 – 6/01/15	JICA	3
4. Wind Profiler System- FMS	11/01/15	JICA	14
5. VSAT Training -FMS	12/01/15	JICA	3
6. Tide Observation System (TOS)	14/01/15	JICA	4
7. Auto Weather Station	16 – 17/01/15	JICA	10
8. Detection System (LDS) - FMS	17/01/15	JICA	11
9. VSAT Training Communication System - FMS	23/01/15	JICA	7

10. CCNA- USP Lautoka	March – November 2015 (Saturday class)	USP – Lautoka	2
11. Multi Hazard Early Warning System – S/Korea	23/03 – 11/04/15	KOICA	1
12. OHS 1 & 2 - Labour	22/04 – 24/04/15	MoIT	3
13. Ministry Senior Executive Training - MoIT	7/05 – 8/05/17	MoIT	3
14. Performance Management Workshop - CTD	26/08 -28/08/15	MoIT	1
15. Calibration of Maintenance of Met Instruments (Train the trainers) – Japan RIC Tsukuba	17/06 – 24/06/15	JICA	3
16. Republic of Korea Pacific Island Climate Prediction Services Project - Nukualofa	15 – 17/07/17	KOICA	1
17. H Tutorial - Lautoka	20 – 24/07/15	PSC	5
18. 6 <sup>th</sup> International Course on Flood Mitigation and Storm water Management	17/08 – 28/08/15	Malaysia	1
19. Regional Write-shop on Climate Service - Novotel	7/08 - 11/08/15	FINPAC	2
20. Common Alert Protocol (CAP) - Rome	22/09 – 24/09/15	WMO	1
21. BIP-M – Pune India	7/0915 – 9/09/16	WMO	1
22. Adaptation to Climate Change - Japan	27/09 – 24/10/15	JICA	1
23. Leadership Training- CTD	28/09 – 02/10/15	PSC	1
24. IBL Visual Weather Basic Training – Nadi	15/09 – 24/09/15	IBL Australia	30
25. FIMS upgrade – BOM Melbourne	28/09 – 02/10/15	BOM Australia	1
26. Leadership – USP Lautoka	07/10 – 9/10/15	PSC	3
27. Induction Training – Laucala FMS office	29/10 – 30/10/15	MoIT	10
28. 11 <sup>th</sup> Southern Hemisphere TC Public Service Workshop – BOM Melbourne	5/10 – 16/10/15	WMO	2
29. BIP-M – PAGASA Philippines	20/10/15 – 30/09/16	WMO	2
30. Pacific International Training Desk	19/10 – 13/11/15	Pacific Desk	1
31. Ocean & Tide Workshop- Solomon Is	09/11 – 21/11/15	DFAT through Climate and Ocean Support Program in the South Pacific (COSPPac)	2
32. Nadi River Flood Control Training - Japan	08/11 – 21/11/15	JICA	2
33. Rainfall Nowcasting – Hong Kong	7/12 – 11/12/15	WMO	1
34. Clean Climate Fund Excel architecture, modality and capacities for Fiji	08/12 – 10/02/16		1
35. Fiji Business Excellence Award (FBEA)	14 – 15/03/16		4

36. WACOP Climate Wave Forecasting and Wave Inundation	15/04/16		18
37. Understanding and Implementing ISO9001:2015 Quality Management System (QMS) for Aeronautical Meteorological Service” - FMS	16 – 27/05/16		10
38. Employment Relation Training – Laucala Met Office	30 – 31/05/16		2
39. Open Merit Recruitment Selection Process (OMRS) Training Component 3 - FMS	30/05 – 01/06/16		13
40. Open Merit Recruitment Selection Process (OMRS) Training Component 4 - FMS	06/06/16		9
41. OHS Training – Laucala Met Office	15 – 16/06/16		4
42. OHS Training – Laucala Met Office	20 – 22/06/16		3
43. OMRS Training – Laucala Met Office	27 – 28/06/16		2
44. Induction Training - FMS	4 & 11/08/16		5
45. Employment Relation Training - FMS	25 – 26/08/16		15
46. Job Description Training – Laucala Met Office	26/08/16		4
47. Workshop on CIFDP – Laucala Met Office	9 – 11/08/16	WMO	3
48. Workshop on Advancing Groundwater Monitoring in Pacific SIDS - Suva	29/08 – 02/09/16	WMO	3
49. Ocean & Tide Workshop - Nadi	05 – 09/09/16		5
50. Himawari – 8 – Satellite- FMS	12 – 16/09/16		3
51. Smart ALert Training- Nadi	28 – 30/09/16		2
52. Component 2 Practioners Workshop – Tanoa International, Nadi	12 – 14/10/16		1
53. Pacific Islands Climate Outlook Forum - Tanoa	17 – 21/10/16		2
54. Media Training - FMS	24 – 26/10/16		15
55. Basic Instruction Package for Met Technician (BIP-MT)	5/09 - 11/11/16		5
56. FMIS Refresher Training - Lautoka	17 – 18/11/16		4
57. Basic Leadership Training – Laucala Met Office	23 – 24/11/16		3
58. Good Governance in Public Sector Training- Laucala Met Office	29 – 30/11/16		3
59. JICA/WMO Maintenance and Calibration of Meteorological Instruments - FMS	21/11 – 2/12/16		2
60. Record Management Training - Laucala Met Training – Laucala Met Office	5/12 – 06/12/16		3

61. Business Process Re-Engineering Training – Laucala Met Office	7 – 8/12/16		2
62. Technical Training & Familiarization Course for the Meteorological Officers - NZ	14 – 18/03/16		2
63. 2016 APCC Sub-seasonal to Seasonal Training – South Korea	27/06 – 01/07/16		1
64. Workshop on El-Nino in Asia Pacific – South Korea	6 – 9/07/16		1
65. JICA Calibration and Maintenance of Met Equipment – Tsukuba, Japan	4 – 15/07/16		3
66. Climate Prediction Service Training – Cook Island	18 – 23/07/16		1
67. Master’s Degree on Meteorology and Climatology – Sendai, Japan	24/08 – 31/03/19		1
68. Basic Instruction Package for Meteorologist (BIP – M) training- Pune , India	13/0916 – 9/09/17		3
69. Wind Profiler & Tide Gauge Training - Japan	19/9 – 7/10/16		2
70. Pacific Island Meteorological Strategy midterm Review meeting - Samoa	6 – 7/10/16		1
71. International Pacific Desk Training - Hawaii	03 – 28/10/16		2
72. Clide Workshop - Samoa	25 – 27/10/16		2
73. Strategic Utilization of hydrological and meteorological data observation technology - Japan	6 – 19/11/16		1
74. 6 <sup>th</sup> Global Precipitation Measurement (GPM) Asia Workshop on Satellite Precipitation Data Utilization - Bangkok	18 – 19/01/17		1
75. Awareness on National Gender Policy 24/01 – Laucala Met Office	20/01/17		3
76. In-Country Regional Training – Cook Island	13 –24/02/17		1
77. Understanding and Implementing QMS ISO 9001:2015 Training - FMS	06 -08/02/17		23
78. QMS Auditors Training - FMS	9 -10/02/17		5
79. National Workshop on Search & Rescue -Suva	23 -24/02/17		2
80. In-Country Regional Training in Kiribati conducted by Senior Technical Officers - Kiribati	15 – 25/05/17		1
81. SmartMet Training - Samoa	22 – 26/05/17		2
82. BIP-MT - FMS	24/04 – 29/06/17		1
83. Evaluators Training – FNU Suva	5 – 9/05/17		1
84. Investigation Workshop - Suva	19 – 21/06/17		3

85. Disiplinary Training for Senior Management - Suva	20 -21/06/17		3
86. Bench Marking - Suva	19 – 23/06/17		2
87. Train the Trainers work - FNU	19 -23/06/17		2
88. Station Technician Training – Kelburn, NZ	24 – 28/07/17		3
89. National Multi-Hazard Early Warning System with Geospatial Application for Disaster Risk Reduction and Sustainable Development	05/07 – 02/08/17		1

#### 2.4.4 Update on Climate Services (to support current and future development)

Questions	Details
What level is your climate services according to WMO standard? (Class 1-4)	A Transition to Class 3
Do you have an update climate science publication for your country? If not, when is the last one and how often do you want to have climate science published?	The last comprehensive publication was done through the PACCSAP New Science & Updated Country Reports in 2014. However, Fiji Meteorological Service provided an up-to-date science of climate change for Fiji’s third National Communication to UNFCCC in 2016. Climate science should be updated every 2 years based on the reporting requirements of National Communication to UNFCCC.
List the qualification obtained by climate officers (do not specify names)	Basic Instruction Package for Meteorologists (BIP-M) (WMO Class I) Post Graduate Diploma in Climate Change Bachelor of Science majoring in Mathematics and Physics Bachelor of Science in Environmental Science Senior Meteorological Observers Training (QI) Basic Instruction Package for Meteorological Technician (BIP-MT)
List the types of training needed by you to enhance the generation and production of climate services	Basic Instruction Package for Meteorologists (BIP-M) (WMO Class I) Research exposure through Master’s Degree Climate applications training, such as, agro-meteorology, hydro-meteorology, etc Sub-seasonal forecasting, including MJO Dynamical downscaling Climate change science and projections Drought monitoring Data homogenization Geographic Information System Programming, e.g. R Quality control of meteorological data Data archival and rescue

	CliDE
What tools do you use to provide seasonal forecast? (please select from SCOPIC, POAMA, METPI, CLIKP, PEAC)	SCOPIC, METPI, POAMA and CLIKP
What model(s) do you use to provide seasonal forecasts on monthly basis?	SCOPIC is used to provide location specific guidance, with the global climate model consensus forecast from the Republic of Korea-Pacific Islands Climate Prediction Services Project and the METPI from NIWA used for providing guidance and confidence to what is provided by SCOPIC.
What are the climate variables you are forecasting?	Rainfall Maximum air temperature Minimum air temperature Sea surface temperature
What are some variables you would like to forecast in the future to meet needs of your client?	Soil moisture Coral bleaching Sea level Rainfall at sub-seasonal timescale
How many AWS do you have that feed into the database you are using?	AWS – 28 Tipping bucket rain gauge - 10
List in order of importance some sectors you engage with? List what products you issue for these sectors?	Disaster Management – ENSO Update, Seasonal Climate Outlooks, Climate Summaries, Drought Information Bulletin Agriculture - ENSO Update, Seasonal Climate Outlooks, Climate Summaries, Drought Information Bulletin Sugar Industry – Fiji Sugarcane Rainfall Outlook Fiji Electricity Authority – Climate Outlook for Monasavu Construction – climate data
List 5 most important mode of communication of seasonal forecasts in your country.	Email Website Radio-talk back shows Stakeholder meetings Social media – Facebook
Do you have any early warning system (EWS) for climate extreme events?	Early warning system for drought is operational to some extent. We continuously monitor drought and provide updates through a tailored product called Drought Information Bulletin. This product is provided to agencies like NDMO, Ministry of Agriculture, Water Authority of Fiji, Fiji Electricity Authority, Sugar Research Institute of Fiji and Divisional Commissioners. However, the system is not fully operational due to the absence of required response plans.

	A Fire Weather Index system has also been developed by NIWA for Fiji through CliDEsc. This system requires testing before it gets operational.
What are some climate extreme events that you want to be included in your EWS?	Early warning system for abnormally dry or wet periods.
What are some challenges that you have in climate division that you want to address with climate science and climate change mitigation and adaptation issues	Improve skill of 1-month forecast Introduce sub-seasonal forecasting of rainfall Provide scenario based rainfall outlook
What are some priority needs for your services that you want to achieve in the next 5 years?	Scenario based rainfall outlook Increase visibility of climate services through greater engagement with stakeholders Provide tailored climate products and services which meets stakeholder needs Automate processes for generating products and services Increase length of climatologically records by data rescue and homogenization

### 3.0 Progress of the NMHS

#### 3.1. UPDATE on Achievements of the NMHS from 2015-2017

No.	Achievements (Activities) of the NMHS (2015-2017)	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	Calibration Training of Meteorological Equipment							X				X			
2	VSAT Operational Training			X								X			
3	Wind Profiler System operational training	X										X			
4	Tide Observation System operational Training		X	X	X							X			
5	Automatic Weather station Training	X		X	X							X			
6	Lightning Detector system operational Training	X	X	X								X			
7	CCNA Training											X			
8	Multi Hazard Early Warning System						X					X			
9	Flood Mitigation and Storm Water Management						X					X			



39	Case study of Fiji Met's engagement with the sugar industry published in the SPREP's compendium of climate services case studies										X				
40	Case study of Fiji Met's engagement with the Fiji Electricity Authority published in the WMO No. 1171										X				
41	PSO(C) pursuing master's degree in Japan through the Pacific Leads Program											X			
42	Worked closely with the Australian Bureau of Meteorology to update Southern Hemisphere Tropical Cyclone Portal				X										
	Installation of a new wind profiler														
	Installation of a new tide gauge														

### 3.2. Proposed Activities to be carried out in the Future (2017-2019)

No	Proposed Activities to be carried out between 2017-2019	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	Work underway to develop Fiji's National Implementation Plan for Climate Services						X				X				
2	A draft SDP						X				X				
3	Government has allocated FJD99,000 in the 2017-18 National Budget for multimedia publication						X								
4	Government has allocated FJD57,000 in the 2017-18 National Budget for Hydrology Training on Basic Field Practice and Basic Data Management				X	X									
5	Installation of new automatic weather stations at the International airports (Nadi and Nausori) runway thresholds	X													
6	Upgrade of the Nadi radar antenna	X						X							
7	Detailed radar maintenance training	X										X			
8	Calibration of national and regional meteorological instruments							X							



<ul style="list-style-type: none"> <li>• Basic Instruction Package for Meteorologists (BIP-M) (WMO Class I) and for Technician (QII)</li> <li>• Early Warning System</li> <li>• Severe Weather and TC</li> <li>• Aviation Safety and Risk Management</li> <li>• Full certification on Part 174</li> <li>• Marine meteorology on Storm Surge, Waves and ocean dynamics</li> <li>• Marine weather services QMS certification</li> <li>• Public Weather QMS Certification</li> </ul>	<ul style="list-style-type: none"> <li>• Basic Instruction Package for Meteorologists (BIP-M) (WMO Class I)</li> <li>• Research exposure through Master’s Degree</li> <li>• Climate applications training, such as, agro-meteorology, hydro-meteorology, etc</li> <li>• Sub-seasonal forecasting, including MJO</li> <li>• Dynamical downscaling</li> <li>• Climate change science and projections</li> <li>• Drought monitoring</li> <li>• Data homogenization</li> <li>• Geographic Information System</li> <li>• Programming, e.g. R</li> <li>• Quality control of meteorological data</li> <li>• Data archival and rescue</li> <li>• CliDE</li> </ul>	<ul style="list-style-type: none"> <li>• Hydrologist Training</li> <li>• Hydrological modeler</li> <li>• Hydrology Technician Training –flood mark survey, Streamflow measurement during high flows, established rating curve,</li> <li>• Data Management and Quality Check</li> <li>• Flood forecasting using flood model</li> <li>• Hydrological Drought Monitoring</li> </ul>	<ul style="list-style-type: none"> <li>• Radar Training</li> </ul>
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Fiji Meteorological Service had a long and colorful history. The past and current leadership, infrastructure, policies, regional and international partnership and organizational set-up has brought FMS this far. However, changing climate patterns, natural disasters, changing environment, institutional alignment and new international conventions/agreement continues to broaden the scope of meteorology and how we do business in challenging times.