This Report is presented to the Fifth Pacific Meteorological Council (PMC-5) Meeting held in Apia, Samoa from 7-9 August 2019

**Papua New Guinea Meteorological Service COUNTRY REPORT**

Reporting on National Priority Actions of the Pacific Islands Meteorological Strategy (PIMS) 2017-2026

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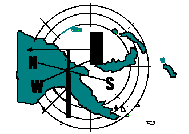


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**Country Report Guideline (Text)**

The report is structured to allow the secretariat to capture the Progress of each NMHSs against the National Priority Actions of the 11 Pacific Key Outcomes (PKO's) of the Pacific Islands Meteorological Strategy (PIMS) 2017-2026 which will be reviewed at this meeting. This report will contribute to;

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

The draft of the Country Report is expected to be submitted by Heads of each NMHSs to the Pacific Met Desk Partnership by **26July 2019** to assist in its planning as highlighted above. The Head of the NMHS can delegate the compilation of this report to their staff.

Provide diagrams, photos and other materials that will be useful for measuring or comparing the progress of the NMHS from 2017 to 2019.

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

The Pacific Key Outcomes (PKO's) which are priority activities of the Pacific Islands Meteorological Service (PIMS) are outlined below:

PACIFIC KEY OUTCOME (PKO) 1: Improved meteorological services for air navigation

PACIFIC KEY OUTCOME (PKO) 2: Improved Marine weather services and establishment of ocean services

PACIFIC KEY OUTCOME (PKO) 3: Improved Public weather services

PACIFIC KEY OUTCOME (PKO) 4: Strengthened NHMS capacity to implement Multi-Hazard Early Warning Systems (MHEWS) for tropical cyclones, coastal inundation and tsunamis

PACIFIC KEY OUTCOME (PKO) 5: NHMS contribution to climate change activities

PACIFIC KEY OUTCOME (PKO) 6: Improved climate information and prediction services through the implementation of the Pacific Roadmap for Strengthened Climate Services

PACIFIC KEY OUTCOME (PKO) 7: Strengthen collaboration between meteorological and hydrological services to better manage water resources and reduce the impact of water related hazards

PACIFIC KEY OUTCOME (PKO) 8: Integrated observing and communication systems

PACIFIC KEY OUTCOME (PKO) 9: NMHS institutional strengthening and capacity development

PACIFIC KEY OUTCOME (PKO) 10: Support to NMHSs is coordinated

PACIFIC KEY OUTCOME (PKO) 11: PMC is an efficient and effective body

# 1.0 Summary

*Papua New Guinea National Weather Service (PNGNWS) made significant improvements in human capacity Building activities amidst declining Meteorological service infrastructure during 2017-2019. In all there were more than 28 activities pertaining to the 11 Pacific key outcomes.*

*Amongst the major milestones was the 1. Certification of the NWS by the PNG Civil Aviation Safety Authority (CASA) under rule part 174 of the civil aviation rules. NWS was part of the PNG civil aviation system which was one of nine(9) countries that were recognized and awarded the International Civil Aviation Organization(ICAO) president’s Certificate for making huge progress or taking enormous strides in the conduct of civil aviation work in terms of efficiency and safety globally. 2. Establishment of the Multi-hazard early warning centre (MHEWC), which set the foundation for cost effective early warning systems for multi-hazards and multi climate sensitive-sectors providing them quality, timely and fit for purpose information and early warning services 3. Re-structure of the NWS under the Department of Transport resulting in an anticipated strengthened Information & Communications Technology (ICT) Branch crucial for real progress in a technology competitive era and 4. The recruitment of thirty six (36) cadets potentially filling gaps of staff shortages and setting realistic foundation for effective implementation of the soon to be launched PNGNWS Strategic Plan scheduled for October, 2019; 5. The delivery of the BIP-MT training to all the 36 recruited trainees. Regardless of speciality highlights PNG’s seriousness in forging our relevance and the new attitude we wish to employ going forward.*

*The development partners including DFAT, USAID, UNDP, WMO, NIWA, UNESCAP continued to be the major source of resource mobilization in most of the activities during 2017-2019.*

*Going forward, further activities are planned and scheduled for completion during 2019-2020 again owing to donor and development partner support. These include the final incorporation of PNG Remote sensing limited AWS network into the PNGNWS network that will improve our dat coverage making spatial impact risk based forecasting on most timescales a reality.*

*Among the major challenges include the desperate need to revitalize 1.Observational infrastructure and 2. Implementation of the Strategic Plan set of activities . The Strategic plan provides the pathway over the next four (4) years 2019-2023 to address key weaknesses in National Weather Service.*

*Great Appreciation is expressed to the PMC, SPREP and development partners and Donors for their assistance in our work during 2017-2021 as we look forward to continued assistance.*

|  |  |  |
| --- | --- | --- |
|  | *Contact of the [country] NMS* | *Alternate Contact* |
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# 2.0 Background Information

## 2.1 Institutional Setup

The PNG National weather service is still positioned as a division of the Ministry of Transport and Infrastructure which has a Minister and lead by the Secretary of the Department supported by three deputy secretaries one of which is responsible for the National Weather Service as Deputy Secretary-Service Delivery. The director of the NWS heads the NWS reporting to the Deputy Secretary-service delivery. The director has four(4) assistant directors being a. Assistant Director-Forecasting & Warning; Assistant Director-Climate and special services; Assistant Director-Facilities and d.Assistant Director-Quality Assuarance.

## 

CURRENT STRUCTURE OF NATIONAL WEATHER SERVICE

## 

**Functions still under DOT**

|  |  |
| --- | --- |
| **Governance** | **Description** |
| MET LEGISLATION: Update on whether or not your country have a stand-alone Meteorology Act or equivalent in place. | It is understood that the current legislation is appropriate for the establishment of the stand alone National Weather Service. |
| Do you require for your Act to be reviewed? What support would you require to complete this activity. | What is required is support to undertake a major submission to Cabinet through the Minister of Transport and Infrastructure outlining the case of PNGNWS, the proposed governance and funding models including the possible restructure to include finance, Human resources and possibly project secretariat. |
| **Strategic Planning** |  |
| Does your NMHS have a strategic plan, implementation/operational plan or equivalent(s)? | PNG NWS in the process of finalizing its Strategic plan funded through the Transport Sector Support Programme (TSSP) of DFAT. The Bureau of Meteorology consultant is currently in country undertaking stakeholder consultations towards the finalization of the Strategic Plan. |
|  |  |
| 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. | Meteorology features prominently in the 1. Vision2050 long term vision, 2.National Disaster Framework for Disaster Risk Reduction and the National Transport Strategy(NTS). |
| Describe the process if your NMHSs is reporting against the SDG or its national equivalent | NIL |

## 

## 2.2 Staffing

Papua New Guinea National Weather Service made significant progress in the area of human resources during 2017-2019. Up to 36 cadets were recruited earmarked to be Meteorological technicians, Operational Meteorologists, Climatologists, Information and Communication Technology and Ocean services specialists.

## 

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Staff | Qualification | Division/Section | No. Professional Staff | | Total |
|  | Staff Name | (Description the qualification under each division) Example; WMO Class 1-4 or other qualification or professional training, education and research) | Responsibility of Staff  (Forecast, Climate, Observation, Administration, etc) | Male | Female | Total Number of Staff |
| 1 | Samuel Maiha | BSC,WMO Class 1, MBA | Administration | M |  |  |
| 2 | Dunstan Itagau | WMO Class 3 | Administration | M |  |  |
| 3 | Vagi Edea | WMO Class 4 | Administration | M |  |  |
| 4 | Kasis Inape | BSC, WMO Class 1, MSC | Climate and special services | M |  |  |
| 5 | Kisolel Posanau | BSC, MSC | Climate and special services |  | F |  |
| 6 | Nanau Vulum | BSC | Climate and special services |  | F |  |
| 7 | Kila Kila | BSC | Climate and special services |  | F |  |
| 8 | Ruth Wari | WMO Class 3 | Climate and special services |  | F |  |
| 9 | Agnes Diap | WMO Class 3 | Climate and special services |  | F |  |
| 10 | Gabriel Tuno | BA, WMO Class 4 | Climate and special services | M |  |  |
| 11 | Jimmy Gomoga | BSC, WMO Class 1, MSC, | Forecasting and Warning | M |  |  |
| 12 | Ruben Wamuni | BSC, WMO Class 1 | Forecasting and Warning | M |  |  |
| 13 | Charlie Vulum | BSC, WMO Class 1 | Forecasting and Warning | M |  |  |
| 14 | Anthony Kalai | BSC, WMO Class 1 | Forecasting and Warning | M |  |  |
| 15 | Kingston Harbon | BSC, MSC | Forecasting and Warning | M |  |  |
| 16 | Murray Kwapena | WMO Class 2 | Forecasting and Warning | M |  |  |
| 17 | Brian Sirip | WMO Class 2 | Facilities | M |  |  |
| 17 |  | WMO Class 4 | Facilities | M |  |  |
| 18 | Daisy Siraba | WMO Class 4 | Observations |  | F |  |
| 19 | Leo Hendricks | WMO Class 2 | Forecasting and Warning | M |  |  |
| 20 | Ula Virobo | BBM, WMO Class 2 | Forecasting and Warning | M |  |  |
| 21 | Heau Lohia | WMO Class 2 | Forecasting and Warning | M |  |  |
| 22 | Sakumai Kanawi | WMO Class 2 | Forecasting and Warning | M |  |  |
| 23 | Peter Warupi | WMO Class 2 | Forecasting and Warning | M |  |  |
| 24 | Eminon Sowape | WMO Class 4, WMO Class 3 | Forecasting and Warning | M |  |  |
| 25 | Tracy Bogela | WMO Class 4 | Forecasting and Warning |  | F |  |
| 26 | Lipan Raphael | BSC, WMO Class 4 | Forecasting and Warning | M |  |  |
| 27 | Adolf Bessie | WMO Class 4 | Forecasting and Warning | M |  |  |
| 28 | Steven Bip | WMO Class 4 | Forecasting and Warning | M |  |  |
| 29 | Justin Maneu | WMO Class 4 | Forecasting and Warning | M |  |  |
| 30 | Alan Mihen | WMO Class 4 | Observations | M |  |  |
| 31 | Robert Thompson | WMO Class 2 | Facilities | M |  |  |
| 32 | Sandra Campbell | WMO Class 4 | Observation |  | F |  |
| 33 | Elijah Gareitz | B.ENG | Eng & Instruments | M |  |  |
| 34 | Amos Kaili | B.IT | Facilities | M |  |  |
| 35 | Myra Selan | WMO Class 4 | Observations |  | F |  |
| 36 | Moruwo Mammo | WMO Class 4 | Facilities | M |  |  |
| 37 | Hymson Waffi | BBM, WMO Class 2 | Facilities | M |  |  |
| 38 | Myra Selan | WMO Class 4 | Facilities | M |  |  |
| 39 | John Wiringa | WMO Class 4 | Facilities | M |  |  |
| 40 | Charles Sauupai | WMO Class 4 | Facilities | M |  |  |
| 41 | Brian Sirip | WMO Class 2 | Facilities | M |  |  |
| 42 | Daisy Siraba | WMO Class 4 | Facilities | M |  |  |
| 43 | Macdonald Sideni | WMO Class 4 | Facilities | M |  |  |
| 44 | Konsy Konnoberi | WMO Class 4 | Facilities | M |  |  |
| 45 | Alex Gabi | WMO Class 4 | Facilities | M |  |  |
| 46 | Steven Adarei | WMO Class 4 | Facilities | M |  |  |
| 47 | Adolf Bessie | WMO Class 4 | Facilities | M |  |  |
| 48 | Posa Pangum | WMO Class 4 | Facilities | M |  |  |
| 49 | Cornelius Gembod | WMO Class 4 | Facilities | M |  |  |
| 50 | Francis Anuma | WMO Class 4 | Facilities | M |  |  |
| 51 | Justina Kawi | BSc, WMO Class 1 | Operations |  | F |  |
| 52 | Florian Wasimbu | B Applied Science, WMO Class 4 | Operations | M |  |  |
| 53 | Charity Tepes | BSc, WMO Class 4 | Operations |  | F |  |
| 54 | Edlynne Rihatta | BSc, WMO Class 4 | Climate |  | F |  |
| 55 | Bomil Alesana | BSc, WMO Class 4 | Ocean Services | M |  |  |
| 56 | Simon Onesimo | WMO Class 4 | Operations | M |  |  |
| 57 | Abraham Kondis | BSc, WMO Class 4 | Operations | M |  |  |
| 58 | Kupson Siga | BSc, WMO Class 4 | Operations | M |  |  |
| 59 | Helenora Joku | BSc, WMO Class 4 | Climate |  | F |  |
| 60 | Helen Obi | WMO Class 4 | Operations |  | F |  |
| 61 | Natasha Nige | BSc-Computer science, WMO Class 4 | IT & Comms |  | F |  |
| 62 | Raymond Mais | B Applied Sc, WMO Class 4 | Eng & Instruments | M |  |  |
| 63 | Nathan Kima | BSc, WMO Class 4 | Climate | M |  |  |
| 64 | Wartovo Horis | BSc-fisheries, WMO Class 4 | Ocean services | M |  |  |
| 65 | Nathan Sive | BSc, WMO Class 4 | Operations | M |  |  |
| 66 | Jeremiah Kinandi | B Applied Science, WMO Class 4 | Eng & Instruments | M |  |  |
| 67 | Allan Samson Pelk | BSc, WMO Class 4 | Operations | M |  |  |
| 68 | Rupa Kalamo Jnr | BSc, WMO Class 4 | Operations | M |  |  |
| 69 | Fiada Kede | BSc, WMO Class 4 | Climate |  | F |  |
| 70 | Kuna Polopea | B Surveying, WMO Class 4 | Operations | M |  |  |
| 71 | Mathew Morowa | BSc, WMO Class 4 | Operations | M |  |  |
| 72 | Solace Kepak | BSc, WMO Class 4 | Climate |  | F |  |
| 73 | Bodibo Vagi | WMO Class 4 | Observations | M |  |  |
| 74 | Bernard Arom | WMO Class 4 | Observations | M |  |  |
| 75 | Carter Guri | BSc, WMO Class 4 | Climate | M |  |  |
| 76 | Nivis Sam | WMO Class 4 | Observations | M |  |  |
| 77 | Harry Pake | WMO Class 4 | Observations | M |  |  |
| 78 | Richard Bevan | WMO Class 4 | Observations | M |  |  |
| 79 | Clara Kakai | WMO Class 4 | Observations |  | F |  |
| 80 | Harrison Thompson | WMO Class 4 | IT & Comms | M |  |  |
| 81 | Dennis Tiden | WMO Class 4 | Observations | M |  |  |
| 82 | Chris Ivan | B IT, WMO Class 4 | IT & Comms | M |  |  |
| 83 | Michael Lai | BA, WMO Class 4 | Observations | M |  |  |
| 84 | Michael Kila | WMO Class 4 | Observations | M |  |  |
| 85 | Jacob Gisua | WMO Class 4 | Observations | M |  |  |
| 86 | Samuel Wari | WMO Class 4 | Observations | M |  |  |
| 87 | Korex Songo | WMO Class 4 | Observations | M |  |  |
| 88 | Veuga Vele | WMO Class 4 | Observations |  | F |  |
| 89 | Lawrence Poloka | WMO Class 4 | Observations | M |  |  |
| 90 | Ruth Geno |  |  |  | F |  |
|  | *Total* | MBA=1, MSC=6, BBN=1, BSC=27, BA=5; WMO Class 1=7, WMO Class 2=14, WMO Class 3=6, WMO Class 4=61 |  | 70 | 20 | 90 |

## 2.3 Finance

[In the PMC-3 in 2015, we have been able to show that the total investment in the region on meteorology per annum is around USD20 million with 80% supporting staff personal. The secretariat would like continue monitoring this investment. This section can be kept confidential. It should be described as an UPDATE on the financial status of the NMHSs and also highlighting other external financial support. They can be summarized in the table below;]

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Description** | **2016** | **2017 Funds [Own currency]** | | **Total [Own Currency]** |
|  | **Total Budget (USD)** | **Administration (USD)** | **Operation (USD)** |  |
| ***Government Support*** |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
| ***.......*** |  |  |  |  |
|  |  |  |  |  |
| ***Total (USD)*** |  |  |  |  |
|  |  |  |  |  |

[You can also highlight some of the key issues in finance that needs to be addressed to contribute to the improvement of your operations under section 4 of the report]

#### 2.3.1 Projects supporting the NMHSs

[This will contribute to agenda 28.7 on the mapping of projects in the region. Provide a list of the number of projects available to each NMHSs

|  |  |  |  |
| --- | --- | --- | --- |
| **Name of Project** | **Total Project Budget(USD’000)** | **Percentage of how much is provided to the NMHSs** | **Summary of NMHSs activities covered by the project** |
| ***Project 1-COSPPAC*** |  | N/A |  |
| ***Project 2 RESPAC*** |  | N/A | Installation of 3 AWSs  Provision of various trainings supported by NIWA |
| ***Project 3 PNG CREWS*** | 1460 | 32 | 36 Cadets undertaken Initial Meteorology Training course BIP-MT  Numerous Management trainings |
| ***.......*** |  |  |  |
|  |  |  |  |
| ***Total (USD)*** | >1460 |  |  |
|  |  |  |  |

# 3.0 Progress of the NMHS

## 3.1. UPDATE on Achievements of the NMHS from 2017-2019

[This can reflect new activities, programs, services implemented by the NMHSs. Under each of the activities, indicate which PKO(s) this activity has achieved. One Activity can contribute to more than 1 PKO]

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **No.** | **Achievements (Activities) of the NMHS (2017-2019)** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** |
| 1 | *Participation In PMC 4* |  |  |  |  |  |  |  |  |  |  | X |
| 2 | *Launching of the Multi-hazard warning centre* |  |  |  | X |  |  | X |  | X | X |  |
| 3 | Establishment of RIMES SESAME (AMAMAS) Tool-March 2018 |  |  |  |  |  |  |  |  | X |  |  |
| 4 | Establishment of Drought Monitoring System March 2018. |  |  |  |  |  |  | X |  |  |  |  |
| 5 | Completed Multi-hazard risk assessment and mapping for 5 X Pilot Provinces-March 2018 |  |  |  | X |  |  |  |  |  |  |  |
| 6 | Establishment of Drought Monitoring System March 2018. |  |  |  |  |  |  | X |  |  |  |  |
| 7 | Completed Multi-hazard risk assessment and mapping for 5 X Pilot Provinces-March 2018 |  |  |  | X |  |  |  |  |  |  |  |
| 8 | Establishment of Bumbu River Flood Early Warning System-June 2018 |  |  |  |  |  |  | X | X |  |  |  |
| 9 | Establishment of X 7 AWS’s- June 2018 |  |  |  |  |  |  |  |  | X | X |  |
| 10 | Hosting of the APEC Climate Symposium-August 2018 |  |  |  |  | X | X |  |  |  |  |  |
| 11 | Hosting of APEC Disaster Managers Forum September 2018 |  |  |  |  |  |  |  |  |  |  |  |
| 12 | Establishment of Southeast Asia Oceania Flash Flood Guidance System, SEAO FFG, USAID, WMO. |  |  |  |  |  |  | X | X |  |  |  |
| 13 | Incorporation of PNG CRS Observations Network into PNGNWS Network –November 2018 | X | X | X |  |  |  |  | X |  |  |  |
| 14 | Provision of Weather Services in collaboration with BOM for APEC Meeting-November 2018 | X | X | X |  |  |  |  |  |  |  |  |
| 15 | Restoration of X 3 AWS’s -May 2019 |  |  |  |  |  |  |  |  | X | X |  |
| 16 | Hosting of Seasonal Forum-May 2019 |  |  |  |  | X | X | X |  |  |  |  |
| 17 | Incorporation of PNG CRS Observations Network into PNGNWS Network –November 2018 | X | X | X |  |  |  |  | X |  |  |  |
| 18 | Provision of Weather Services in collaboration with BOM for APEC Meeting-November 2018 | X | X | X |  |  |  |  |  |  |  |  |
| 19 | Participation in PMC 5 |  |  |  |  |  |  |  |  |  |  | X |
| 20 | Strengthening of ICT with NWS | X | X | X |  | X | X |  |  | X | X |  |
| 21 | Establishment of RIMES FOCUS Climate Model –July 2019 |  |  |  | X |  | X |  |  | X |  |  |

## 3.1.1 Various Trainings undertaken by NMHS

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **No.** | **Achievements (Activities) of the NMHS (2017-2019)** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** |
| 1 | *Train the Trainer Training for BIP-MT Instructors, PNG HR Institute.* | X | X | X | X | X | X | X | X | X | X | X |
| 2 | *Training of 4 X Officers at Pacific Desk, Honolulu, USA* |  |  |  |  |  |  |  |  |  |  |  |
| 3 | Establishment of and training on RIMES SESAME (AMAMAS) Tool-March 2018 |  |  |  |  |  |  |  |  | X |  |  |
| 4 | Completion of 2 X Bachelor in Management March 2018 | X | X | X |  |  |  |  |  | X |  |  |
| 5 | Establishment of and training on Drought Monitoring System March 2018 ; BMKG, Indonesia |  |  |  |  |  |  | X |  |  |  |  |
| 6 | Completed Multi-hazard risk assessment and mapping for 5 X Pilot Provinces-March 2018 |  |  |  | X |  |  |  |  |  |  |  |
| 7 | Completion of 2 X AWS Technical and Maintenance up - skilling: July-August 2018. NIWA (Christchurch) |  | X | X | X |  |  |  | X | X |  |  |
| 8 | Completion of 2 x Climate Data management and Product Development Trainings: July – August 2018. NIWA Wellington) |  | X |  | X | X | X |  | X | X |  |  |
| 9 | Hydrology Training for two officers May 2018, University of San Diego, USA. |  |  |  |  |  |  | X |  |  |  |  |
| 10 | Completion of 1 X Master in Meteorology, University of Hongkong. | X | X | X | X |  |  |  |  | X |  |  |
| 11 | Initial Meteorology Training of 36 cadets on BIP-MT-June2019 | X | X | X | X | X | X | X | X | X | X | X |
| 12 | Completion of 1 X Master in Climate Change-June 2019 |  |  |  |  | X | X |  |  | X |  |  |
| 13 | Completion of 1X International Training on Satellite Applications-June 2019, China. | X | X | X |  |  |  |  | X | X |  |  |
| 14 | Successful completion of Climate Field School-3 X Officers with BMKG, Indonesia. |  |  |  |  | X | X |  |  |  |  |  |

## 

## 3.2. Proposed Activities to be carried out in the Future (2019-2020)

There are various activities planned for the next two years 2019-2021

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **No** | **Proposed Activities to be carried out between 2019-2020** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** |
| 1 | Launching of the PNGNWS Strategic Plan-October 2019 | X | X | X | X | X | X | X | X | X | X | X |
| 2 | National Climate Outlook Forum-October 2019 |  |  |  | X | X | X |  |  |  |  |  |
| 3 | Development of the Implementation plan for the Strategic plan | X | X | X | X | X | X | X | X | X | X | X |
| 4 | Review of the PNG Civil Aviation Act to better position PNGNWS | X | X | X | X | X | X | X | X | X | X | X |
| 5 | Upgrade of Internet & Communications Technology | X | X | X | X | X | X |  | X | X |  |  |
| 6 | Connection of Fiber Link to Multi-Hazard Early Warning Centre |  |  |  | X |  |  |  |  |  |  |  |
| 7 | Upgrade of HPC to 120 Cores for weather & climate modeling | X | X | X | X |  |  |  |  | X |  |  |
| 8 | Models to monitor tropical cyclones, coastal inundations & Tsunamis |  | X |  |  |  |  |  |  |  |  |  |
| 9 | Multi-hazard risk assessments and mapping for remaining provinces |  |  |  |  |  |  |  |  | X |  |  |
| 10 | Development of Sectoral climate service products including case studies |  |  |  | X | X | X |  |  |  |  |  |
| 11 | Anticipated to complete Data rescue activities – Imaging/scanning of Paper records and Digitization of data values. |  |  |  | X | X | X | X | X |  |  |  |
| 12 | Draft plan: - data rescue and climate metadata.  These activities under CREWS PNG   * Adaptation of Climate Extremes Monitor from BOM to PNGNWS (Q1-Q3 2020) * Enhancing availability of NWS Products from global & regional NWS centres including BOM for use in short-range forecasting (Q1-Q4 2020) * Use Sub-seasonal to Seasonal (1 week to 3 months) from global centres (Q1-Q3 2020) * Development of Drought EWS for PNG (Q1-Q4 2020)   Long term Development Plan for PNGNWS (Q1-Q2 2020) | X | X | X | X | X | X | X | X |  | X |  |
| 13 | Capacity Building activities under DFAT ASA | X | X | X |  |  |  |  |  | X |  | X |
| 14 | Resilience Building Activities under RESPAC Project Work plan | X | X | X | X | X | X | X | X | X | X | X |

## 3.2.3 Proposed Training Activities 2019-2021

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **No** | **Proposed training Activities to be carried out between 2019-2020** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** |
| 1 | Training of WMO class 1 personnel | x | x | x | x | x | x | x | x | x | x | x |
| 2 | Training of Supervisory personnel for Outstations | x | x | x | x | x | x | x | x | x | x | x |
| 3 | Delivery of Training on Core Competencies for WMO/ICAO Requirements for Aviation, Marine & Public Weather Services, Tropical Cyclones and Climate Services | X | X | X |  |  |  |  |  | X |  |  |
| 4 | Seminar on ICT Planning , construction and development Capability. 2019 | X | X | X |  |  |  |  | X | X |  |  |
| 5 | Training course on Computer Software/Hardware/Network Technology for developing countries. 2019 |  |  |  |  |  |  | X | X | X |  |  |
| 6 | Seminar on Flood Control and Disaster Relief Technique and Management for developing countries. 2019 |  | X | X |  |  |  |  |  | X |  |  |
| 7 | Seminar on Climate change and climate information service for developing countries. 2019 |  |  |  |  |  | X | X |  |  |  |  |
| 8 | Training on Climate change science |  |  |  | X | X | X |  |  |  |  |  |
| 9 | Training on Climate change services |  |  |  | X | X | X |  |  | X |  | X |
| 10 | Case Studies on Climate Change Impacts under Projections. |  |  |  | X | X | X |  |  |  |  |  |

## 3.3 Contributions from Aid Partners

Various donors and development partners contributed towards capacity building activities in PNG national weather service during 2017-2019 and are expected to continue during 2019-2021.The respective activities are summarized as follows.

|  |  |  |  |
| --- | --- | --- | --- |
| Donor/Development Partner | Description | Activities | Remarks |
| 1. DFAT -BOM | Consequent to a diagnostic of the PNGNWS by DFAT under the transport sector support program, (TSSP)NWS was included under an Annex to an MOU between Australian transport sector agencies and PNG transport sector agencies enabling a bilateral partnership between BoM and NWS. | * Provision of weather services for the APEC forum in APEC PNG2018 * Incorporation of 38 PNG Centre for remote sensing (PNGCRS) AWSs to the NWS observations network. * Development of the PNG strategic plan | Various other capacity building activities are planned under a workplan that will include support for WMO Class 1 training. |
| 1. DFAT-COSPPAC |  | * Clide server installation * Earwatch Drought warning tool * CliDESC installation by NIWA * Various other trainings including participation in Steering committee meetings. |  |
| 1. UNDP-CCDA | PNGNWS was a beneficiary implementation agency of the UNDP funded adaptation to coastal flooding project in partnership with the PNG climate change development Authority and the PNG National Disaster Centre(NDC) | * Installation of 5X AWSs with NWA support * Provision of various trainings in new Zealand on AWSs and Development of climate services by NIWA | There are very real maintenance and sustainability challenges to calibrate, replace parts and replace beyond life time. |
| 1. UNDP-RESPAC | PNGNWS benefited from the UNDP Russian funded regional Resilience Pacific project via a workplan of in country activities during 2017-2019. | * 2 X AWSs at Kundiawa and Port Moresby. * Rehabilitation of NWS HQ building * Upgrade of fibre-optic communications infrastructure * Supply of uniforms to NWS staff. | Other activities are planned under a country workplan.  Great Appreciation to the Government of Russia and UNDP(FIJI) |
| 1. WMO-CREWS | PNG is a beneficiary of the WMO PNG CREWS project to a value of USD1.46M in collaboration with BoM and WMO. | * Project launched in Feb 2019 * Delivery of the BIP-MT training in June, 2019 * Management Training of staff * Various capacity activities mainly targeted at climate services | Planned activities to be implemented by 2021.  Next Pacific Crews Meeting would include PNG CREWS Report. |
| 1. WMO-USAID | PNG NWS was a beneficiary of the Southeast Asia Oceania Flood Forecast Guidance System | * Installation of relevant tools enabling flood forecast guidance * Training of two(2) hydrologists at the HRC at University of San Diego, USA. | * System is currently fully operational |
| 1. UNESCAP-BMKG | PNGNWS was a beneficiary of the satellite based drought monitoring system funded by UNESCAP and implemented by BMKG. | * Satellite based drought monitoring tool. | * System is currently fully operational |
| 1. UNESCAP-RIMES | UNESCAP continues to support RIMES in PNG | * Seasonal Forum or PNG National Climate outlook Forum-Bi-annual since 2016. | Next Seasonal Forum jointly with Geo-hazards is planned for October, 2019 |

# [4.0. Gaps and Future Needs that would Improve the National Meteorological and Hydrological Services](#_Toc353888916)

The gaps within PNG NWS that require resources to close are as follows: 1) adequate networks to monitor Meteorological parameters; 2) a robust communication system for data transmission, dissemination of forecasts and sharing of information; 3) high speed computing system for data assimilation and numerical weather prediction; 4) human resources equipped with appropriate training and skills; and 5) close interaction with users of weather and climate information. 6. Further specialized forecasting skills to detect and predict severe weather phenomena also requires closer collaboration among NMHS in the region for enhanced data sharing through the Global Telecommunication System of the World Meteorological Organization (WMO). 7. Further specialized training including in delivery of climate change services under different scenarios but especially the rapidly warming climate scenario.