

Weather Ready Pacific Implementation Plan



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Weather Ready Pacific Implementation Plan

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Abbreviations

AUD	Australian dollars
EW4ALL	Early Warning for All
GEDSI	Gender equality, disability and social inclusion
IFRC	International Federation of Red Cross and Red Crescent Societies
ITU	International Telecommunication Union
KRA	Key result area
NDMO	National Disaster Management Organisation
NMHS	National Meteorological and Hydrological Services
PIFS	Pacific Islands Forum Secretariat
PMC	Pacific Meteorological Council
PMU	Project Management Unit
SPREP	Secretariat of the Pacific Regional Environment Programme
UNDRR	United Nations Office for Disaster Risk Reduction
USD	United States dollars
WMO	World Meteorological Organisation
WRP	Weather Ready Pacific

1. Executive Summary

In 2021, Pacific Leaders endorsed the Weather Ready Pacific (WRP) Decadal Programme of Investment, which seeks to reduce the human and economic costs of severe weather, water and ocean events across Pacific island communities, by strengthening national meteorological and hydrological organisations and their partnerships with national disaster management organisations. In February 2023, the Government of Australia pledged their support for WRP with a contribution of AUD 30 million. In August 2023 the Pacific Meteorological Council (PMC) requested the Secretariat of the Pacific Environment Programme (SPREP) to develop an implementation plan for WRP for presentation at a PMC out-of-session meeting at the end of October 2023.

This document presents the Implementation Plan for WRP starting in 2024 through to 2033. The plan is divided into three main sections: an Overall Implementation Plan covering the period 2024–2033 with an indicative budget of USD 191 million, a Phase 1 Implementation Plan covering the period 2024–2028 with an indicative budget of USD 40 million, and an Inception Phase Implementation Plan covering the period November 2023–December 2024 with an indicative budget of USD 7.7 million.

The three plans are based on the 2021 foundation document entitled “*Weather Ready Pacific – A Decadal Programme of Investment*”. The Implementation Plans were developed over a 7-week period and involved several drafts and rounds of consultations with National Meteorological and Hydrological Service (NMHS) directors, development partners, PMC panels, PMC Secretariat, SPREP and others.

The Implementation Plans cover five key result areas (KRA) developed in the 2021 WRP Decadal Programme of Investment: KRA 1: Management and Coordination, KRA 2 Production of Forecasts and Warnings, KRA 3: Communication and Delivery of Forecasts and Warnings to End-users, KRA 4: Infrastructure, and KRA 5: Capacity and Training. Together, these KRAs contribute to the WRP Overall Objective: *Pacific island communities enjoying improved safety, security and prosperity*; and the WRP Strategic Objective: *Communities, government and industries having the systems, forecasts, warnings and information to enact response plans to extreme weather events and in a timely manner*.

All three Implementation Plans are predicated on an overarching principle to address gender equality, disability and social inclusion (GEDSI) goals in recruitment, training, consultation and all WRP activities, and to adopt a people centred approach to the WRP.

The Implementation Plans link closely to the Early Warning for All (EW4ALL) initiative, particularly Pillar 2: Detection, observations, monitoring, analysis and forecasting of hazards and Pillar 3: Warning dissemination and communication.

A risk assessment was conducted as a parallel activity to the preparation of the Implementation Plans and a summary of the operational and financial risks is included in this document.

Start-up support for the Inception Phase of the Implementation Plan is currently being processed through a Grant Arrangement with the Government of Australia and includes the following activities:

- i. Recruitment for the Project Management Unit core team: Programme Manager, Technical Adviser Infrastructure and Capacity/Training, Finance Accountant and Finance and Administration Officer.
- ii. Consultancy to prepare a strategy for environmental and social safeguards for the WRP.
- iii. Consultancy to coordinate and manage the WRP activities while recruitment of the Programme Manager is ongoing.
- iv. Consultancy to prepare version 2 of the Implementation Plan (V2) with a full risk evaluation matrix.
- v. Consultancy to prepare a “Programme of Work” for the WRP to include revision of the 2021 Decadal Programme of Investment document and in coordination with the Implementation Plan (V2).
- vi. Consultancy to prepare a legal agreement for SPREP to host the WRP and a legal and financial framework for the WRP pooled investment fund.
- vii. Preliminary activities for KRAs 2, 3, 4 and 5.

This Implementation Plan and its costings are indicative and require revision and updating on at least an annual basis as new information becomes available and new investments are committed.



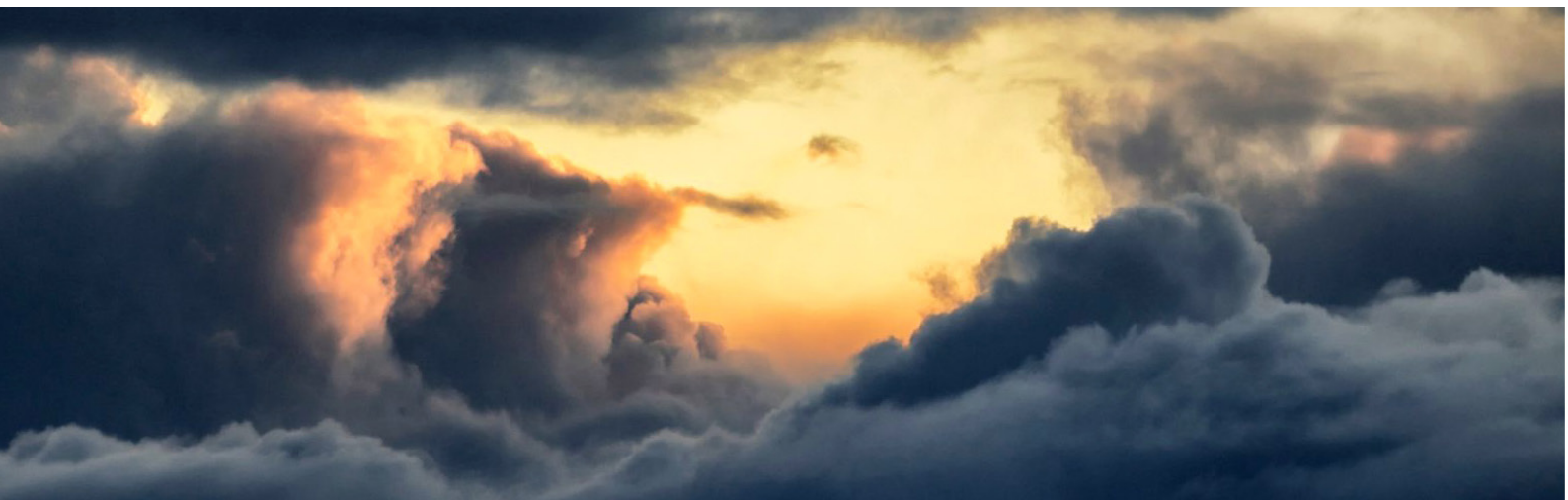
2. Introduction

Pacific islands are vulnerable to a wide range of weather, climate, hydrological, oceanic and other related environmental extreme and high impact events, including tropical cyclones and typhoons, strong winds, earthquakes, volcanic eruptions, drought, coastal inundation (including storm surges, high waves, ocean swell, and tsunami), high rainfall and floods.

Further, the risks posed by extreme events are increasing as the Pacific region is particularly vulnerable to climate change and it is likely that extreme events will become more intense and/or frequent in the coming decades. Pacific islands will be significantly affected by sea level rise, which will greatly increase the risks posed by coastal inundation events. Climate change and disaster risks undermine the ability of the Pacific region to reach the Sustainable Development Goals.

In 2021, Pacific Leaders endorsed the Weather Ready Pacific (WRP) Decadal Programme of Investment, which seeks to reduce the human and economic costs of severe weather, water and ocean events across Pacific island communities, by strengthening national meteorological and hydrological organisations and their partnerships with national disaster management organisations. This programme of investment ensures that the Pacific participates in and benefits from advances in forecast and warning systems that should ultimately enable increased accuracy, geographic specificity and lead time of forecasts.

This document presents an implementation plan for WRP starting in 2024 through to 2033. The plan is divided into three main sections: an Overall Implementation Plan covering the period 2024–2033, a Phase 1 Implementation Plan covering the period 2024–2028, and an Inception Phase Implementation Plan covering the period November 2023–December 2024.



2.1 WRP Planning Timeline

The key planning activities leading to the start of WRP in November 2023 are shown in the table below.

DATE	ACTIVITY
August 2019	The Pacific Meteorological Council (PMC) at the 5 th Biennial meeting (PMC-5) recommended that the Secretariat of the Pacific Regional Environmental Programme (SPREP) commission a study to scope the feasibility for a Decadal Programme of Investment to enable Pacific islands to prepare for and respond to the risks of extreme and high impact events.
April 2021	The scoping and feasibility report, Weather Ready Pacific – a Decadal Program of Investment was produced.
August 2021	At the 51 st Pacific Islands Forum Leaders (PIFS) Retreat the Weather Ready Pacific – a Decadal Program of Investment report was endorsed.
February 2023	At the PIFS Special Retreat the Government of Australia pledged their support for WRP with a contribution of AUD 30 million (m).
July–August 2023	Governance model for WRP was prepared.
August 2023	Recommendations of PMC-6 meeting: <ul style="list-style-type: none">▪ Agreed to the governance model variation option.▪ Agreed to a hybrid investment facility.▪ Requested SPREP develop an implementation plan for presentation at an out-of-session meeting at the end of October.▪ Endorsed that Weather Ready Pacific be the key vehicle for implementation of the United Nations Early Warning for All (EW4All) initiative in the Pacific region.
October 2023	Implementation plan presented to PMC 6.2 out-of-session meeting and endorsed.

2.2 Methodology for the Preparation of the Implementation Plan

This implementation plan was prepared over a 7-week period from the end of August to mid-October, 2023, by a consultant supported by the New Zealand Ministry of Foreign Affairs and Trade.

Key activities are listed below:

- Desktop exercise to review key documents, including country reports from PMC-6.
- Consultations with National Meteorological and Hydrological Service (NMHS) directors, development partners, PMC panels, PMC Secretariat, SPREP and others.
- Meeting at SPREP 18–22 September 2023, with representative NMHS directors, development partners and SPREP colleagues to review and prioritise activities for the Implementation Plan.
- Circulation and review of feedback from a virtual questionnaire sent to all NMHS directors.
- Preparation of a draft comprehensive Implementation Plan covering three time periods: Overall Implementation Plan, 2024–2033, Phase 1 Implementation Plan, 2024–2028, and an Inception Phase Implementation Plan, November 2023–December 2024.
- Circulation of drafts of the Implementation Plan to all partners, further consultations and consolidation of feedback.

Prioritisation of activities for the Phase 1 Implementation Plan was determined, to a large extent, by guidance from the participants to the September 2023 meeting as well as the response to the virtual questionnaire sent to all NMHS directors. The summarised results of the questionnaire survey are presented as Annex 1.

2.3 Timeframe for the Preparation of the Implementation Plan

The PMC-6 meeting requested SPREP to develop an implementation plan for presentation at an out-of-session PMC meeting at the end of October 2023. The September meeting at SPREP further clarified that there should be an Overall Implementation Plan covering the 10-year period 2024–2033 and within this there would be a nested Phase 1 Implementation Plan covering the period 2024–2028. The latter plan would be more detailed and would include the committed funds of USD 20 m from the Government of Australia as well as an additional funding of USD 20 m that is under negotiation with other development partners.

During the preparation of the Implementation Plan, negotiations advanced between the Government of Australia and SPREP for a Grant Arrangement to support start-up activities in an Inception Phase. As a result, a third Implementation Plan for an Inception Phase, November 2023–December 2024, was prepared to include committed start-up funds from the Government of Australia as well as additional funding that is under negotiation with other development partners.

3. Programme Description

3.1 Scope of Weather Ready Pacific

The logical framework for the WRP defines the **Overall Objective** for the WRP as follows: *Pacific island communities enjoying improved safety, security and prosperity*; and defines the **Strategic Objective** for the WRP as: *Communities, government and industries having the systems, forecasts, warnings and information to enact response plans to extreme weather events and in a timely manner.*

The outline logical frameworks for the Overall WRP and Phase 1 WRP are presented as Annexes 2 and 3 respectively.

The Implementation Plans cover five key result areas (KRA) developed in the 2021 WRP Decadal Programme of Investment and summarised below.

KRA 1 Management and Coordination

This covers the establishment of a fully resourced Project Management Unit, support for travel, operations, consultations, communications, annual WRP steering committee meetings (virtual and face-to-face) and support for PMC Biennial meetings. Support for start-up secondments or consultancies for start-up and planning activities during inception are included.

KRA 2 Production of Forecasts and Warnings

This covers the development of an open source, suite of automated meteorological, hydrological and oceanographic forecast and warning products; an enhanced data delivery system – the Pacific Weather Exchange; coastal inundation and riverine flood forecasting; provision of additional staff in NMHSs to support ICT and communications; and strengthened aviation weather forecasts.

KRA 3 Communication and Delivery of Forecasts and Warnings to End-users

This involves the close collaboration with NMHS, National Disaster Management Organisations (NDMOs) and EW4ALL partners to prepare and deliver impact-based, location specific warnings, based on assessments and modelling, and incorporating traditional knowledge.

KRA 4 Infrastructure

This covers the enhancement of hydro-meteorological infrastructure networks and associated information technology (IT) including automatic weather stations, automated upper air observation stations, weather watch radars, river and tide gauges, wave buoys, IT infrastructure, data servers; and the establishment of an equipment calibration centre.

KRA 5 Capacity and Training

This covers the establishment of a regional training centre for observers, technicians and IT specialists; training of forecasters to a BIP-M standard; hydrology and hydrography training, professional workshops, twinning programmes and leadership training for mid and senior level NMHS staff.

Combined, these KRAs contribute to the Overall Objective and the Strategic Objective discussed above in the logical framework.

All three Implementation Plans are predicated on an overarching principle to address gender equality, disability and social inclusion (GEDSI) goals in recruitment, training, consultation and all WRP activities, and to adopt a people centred approach to the WRP.

The meetings and consultations guiding the Implementation Plans recognised that all KRAs are important and that activities under each KRA will be started in the Phase 1 Implementation Plan, 2024–2028, with emphasis on: KRA 1 Management and Coordination; KRA 4 Infrastructure; and KRA 5 Capacity and Training, and in the Inception Phase Implementation Plan.

It was also recognised that the effort and cost required for KRA 3: Communication and Delivery of Forecasts and Warnings to End-users, had been underestimated in the 2021 WRP Decadal Programme of Investment document and this has been addressed, to some extent, in the Implementation Plans.

The WRP has been identified as the vehicle for implementation of EW4ALL initiative and this is discussed further in the section below.

3.1.1 Delivery of Early Warning for All

EW4ALL is a global initiative to ensure that everyone on Earth is protected from hazardous weather, water, or climate events through life-saving early warning systems by the end of 2027.

The EW4ALL Action Plan calls for investments of USD 3.1 billion over five years. It leverages existing pooled funding mechanisms, such as the Climate Risk and Early Warning Systems initiative and the Systematic Observations Financing Facility, as well as global multilateral funds including the Green Climate Fund and the development banks.

The EW4ALL initiative is co-led by the World Meteorological Organization (WMO) and the United Nations Office for Disaster Risk Reduction (UNDRR), with support from the International Telecommunication Union (ITU), the International Federation of Red Cross and Red Crescent Societies (IFRC) and other partners.

The initiative has four pillars:

PILLAR 1 Ensuring all countries have access to reliable, understandable and relevant risk information, science and expertise (led by UNDRR).


PILLAR 2 Ensuring all countries have robust forecast and monitoring systems (both soft and hardware infrastructure) and enabling policies to support optimisation and sustainability of hazard monitoring and early warning systems (led by WMO).

PILLAR 3 Using a people-centred approach to ensure that early warnings are effectively and timely disseminated to reach everyone, especially those most at risk (led by ITU).

PILLAR 4 Ensuring local governments, communities and individuals at risk have the knowledge and means to take pre-emptive early actions to prepare for and respond to incoming disasters upon receiving warnings (led by IFRC).

During the PMC-6 meeting, August 2023, WRP was endorsed as the vehicle for implementation of the EW4ALL initiative in the Pacific region. The three Implementation Plans presented in this document link Pillar 2 of EW4ALL to WRP KRA 2 Production of Forecasts and Warnings; and Pillar 3 of EW4ALL to WRP KRA 3 Communication and Delivery of Forecasts and Warning to End-users, see the graphic below.


Pillar 1



Disaster risk knowledge
Systematically collect data and undertake risk assessments

- Are the hazards and the vulnerabilities well known by the communities?
- What are the patterns and trends in these factors?
- Are risk maps and data widely available?


Pillar 2 and WRP KRA 2



Detection, observations, monitoring, analysis and forecasting of hazards
Develop hazard monitoring and early warning services

- Are the right parameters being monitored?
- Is there a sound scientific basis for making forecasts?
- Can accurate and timely warnings be generated?


Pillar 4



Preparedness and response capabilities
Build national and community response capabilities

- Are response plans up to date and tested?
- Are local capacities and knowledge made use of?
- Are people prepared and ready to react to warnings?

Pillar 3 and WRP KRA 3



Warning dissemination and communication
Communicate risk information and early warnings

- Do warnings reach all of those at risk?
- Are the risks and warnings understood?
- Is the warning information clear and usable?

3.2 Indicative Budget

The indicative budgets for the three nested Implementation Plans are shown in the table below.

KEY RESULT AREA (KRA)	OVERALL IMPLEMENTATION PLAN BUDGET USD M	PHASE 1 IMPLEMENTATION PLAN BUDGET USD M	INCEPTION PHASE IMPLEMENTATION PLAN BUDGET USD M
KRA 1: Management and Coordination	20.31	10.15	2.34
KRA 2: Production of Forecasts and Warnings	38.54	8.30	0.30
KRA 3: Communication and Delivery of Forecasts and Warnings to End-users	9.72	2.66	0.96
KRA 4: Infrastructure	96.38	10.58	3.55
KRA 5: Capacity and Training	20.44	5.38	0.23
Contingency and other	5.56	3.00	0.33
TOTAL	190.95	40.07	7.71

4. WRP Implementation Plan

The three Implementation Plans:

1. Overall WRP, 2024–2033
2. WRP Phase 1, 2024–2028
3. WRP Inception Phase, November 2023–December 2024

are presented in the following pages.

Annex 4 presents the PMU staff costings for the Overall and the Phase 1 Implementation Plans.

Implementation Plan for the Overall WRP, 2024–2033

The investment packages in the 2021 Decadal Program of Investment have been updated and the total indicative budget is USD 191 m.

There are 5 investment packages (renamed Key Result Areas [KRAs] in this Implementation Plan) and development partners are invited to invest in these packages.

USD 40 m has been committed and is “under negotiation” to start activities in each KRA over the period 2024–2028 (Phase 1).

The Overall Implementation Plan is based on an overarching principle to address gender equality, disability and social inclusion (GEDSI) goals in recruitment, training, consultation and all WRP activities.

ACTIVITY	DURATION (YEARS)	TIMEFRAME	2023 INDICATIVE COST USD M
KRA 1 MANAGEMENT AND COORDINATION			
Support for PMU, travel for PMU, consultations with NMHS, PMC Panels, Liaison Committee and partners, communication activities	10	2024–2033	18.29
Preparatory start-up work in 2024 to prepare:			
i. “Programme of Work” for the WRP to include revision of 2021 Decadal Programme of Investment document;			
ii. Implementation plan (V2) and a full risk matrix;	1	2024	0.55
iii. legal agreement with SPREP to host the WRP and a legal and financial framework for the WRP pooled investment fund;			
iv. strategy for environmental and social safeguards for the WRP (including GEDSI); and			
v. interim project coordination while core PMU staff are recruited.			
WRP annual steering committee meetings and support for attendance at PMCBiennial Meetings	10	2024–2033	1.47
SUBTOTAL			20.31
KRA 2 PRODUCTION OF FORECASTS AND WARNINGS			
Development of an open source, integrated platform, to analyse and access automated weather and warning products for specific locations. The three components of this activity are:			
1. Integration of global/ regional/ national models to deliver automated forecasts and warnings;	10	2024–2033	11.00
2. Improved forecasting services in NMHSs; and			
3. A well-supported delivery platform. (Budget includes the initial preparation of a plan and budget for the entire activity).			
Strengthen aviation forecasting in aerodrome meteorological offices and meteorological watch offices, as designated in relevant International Civil Aviation Organisation regional air navigation plans.	10	2024–2033	1.98
Strengthen NMHS public forecasting; and marine forecasting (recognising that marine forecasts are targeted at specific stakeholders); and establishment of two-way WMO information systems (WIS) allowing NMHS to share their information worldwide.	10	2024–2033	6.93
Implementation of coastal inundation forecasting in 5 countries including riverine flood forecasting.	10	2024–2033	12.25
Provision of additional ICT staff in each of the 14 NMHS not aligned with the USA National Weather Service or Meteo France and 2 additional ICT staff in Fiji.	10	2024–2033	6.38
SUBTOTAL			38.54

ACTIVITY	DURATION (YEARS)	TIMEFRAME	2023 INDICATIVE COST USD M
KRA 3 COMMUNICATION AND DELIVERY OF FORECASTS AND WARNINGS TO END USERS			
Development of a detailed plan and costs for development and delivery of response-based messages and warnings to end-users based on: (1) National workshops with NMHS, NDMO, vulnerable groups and socio-economic sectors to review existing messages and warnings to end-users; and (2) Regional workshop with NDMOs, NMHS, EW4All.	5	2024–2028	0.66
Installation of internet access equipment and operational costs of selected NMHSs and NDMO e.g Starlink.	5	2024–2025	0.50
Preparation of impact-based, location specific warnings, based on assessments and modelling, and incorporating traditional knowledge and GEDSI considerations especially for the most vulnerable groups such as persons with disabilities, children. In collaboration with EW4ALL (pillar 3) partners.	3	2026–2028	3.93
Delivery of the impact-based messaging, translation into local languages, community engagement, mobile apps, public awareness activities including to those end users with no internet.	5	2029–2033	3.93
Review of end-user response to messaging	2	2030–2032	0.50
Trainings of NMHSs and NDMO on the WMO Common Alerting Protocol so that messages can be distributed by/on any digital platform.	10	2024–2033	0.20
SUBTOTAL			9.72
KRA 4 INFRASTRUCTURE			
Preparation of national observations network plans for country automatic weather stations; and revitalisation, upgrade and expansion of existing network of automatic weather stations in collaboration with the Systematic Observations Financing Facility.	10	2024–2033	12.34
Revitalise, upgrade and expand existing network of river gauges and rain gauges	9	2025–2033	8.05
Establishment of automated meteorological balloon launching systems in 7 countries (not covered by the Green Climate Fund project)	9	2025–2033	20.52
Development of data capture from aircraft observation using the aircraft meteorological data relay system.	9	2025–2033	0.59
Preparation of a radar network plan and establishment of weather watch radar in 5 countries	9	2025–2033	11.65
Establishment of wave rider buoys and establishment of standard operating procedures.	9	2025–2033	19.75
Establishment of fixed and relocatable tide gauges	9	2025–2033	13.93

ACTIVITY	DURATION (YEARS)	TIMEFRAME	2023 INDICATIVE COST USD M
KRA 4 INFRASTRUCTURE <i>cont.</i>			
Establishment of staff resource with SPC to coordinate the ocean infrastructure.	9	2025–2033	0.47
Establishment of high accessibility ICT Infrastructure with cybersecurity at the national level, standalone/online forecaster work stations and technical workshops	9	2025–2033	7.22
Establishment of an Instrument Calibration Centre	9	2025–2033	1.86
SUBTOTAL			96.38
KRA 5 CAPACITY AND TRAINING			
Establishment of a Regional Training Centre and the training of observers, technicians and IT specialists	10	2024–2033	4.16
Training of NMHS forecasters to BIP-M standard	10	2024–2033	2.7
QMS Training Programme for Pacific SIDS	5	2028–2033	0.98
Provision of diploma and postgraduate certificate training in hydrography and hydrology, and training courses on marine meteorological services and assessment of marine competencies	9	2025–2033	2.44
Specialised regional workshops delivered with national and regional partners, and development and delivery of online training courses	9	2025–2033	8.15
Twinning programme with BOM, NZ Met Service, NIWA and NOAA to provide ongoing mentoring to NMHS	9	2025–2033	0.97
Establish and deliver a Pacific Meteorology Leadership Programme for mid and senior level staff	10	2024–2033	1.04
SUBTOTAL			20.44
Contingency fee (3%)			5.56
OVERALL TOTAL			190.95

Implementation Plan for WRP Phase 1, 2024–2028

Combining committed funds of USD 20 m from the Government of Australia and funds from other development partners currently under negotiation.

Total indicative budget for Phase 1 = USD 40 m. Other development partners are invited to invest in Phase 1.

The Phase 1 Implementation Plan is based on an overarching principle to address gender equality, disability and social inclusion (GEDSI) goals in all recruitment, training, consultation and all WRP activities

ACTIVITY	DURATION (YEARS)	TIMEFRAME	2023 INDICATIVE COST USD M
KRA 1 MANAGEMENT AND COORDINATION			
Establishment of PMU, travel for PMU, consultations with NMHS, PMC Panels, Liaison Committee and partners, communication activities	5	2024–2028	8.72
Preparatory start-up work to include:			
<ul style="list-style-type: none"> ▪ Preparation of a “Programme of Work” for the WRP to include revision of 2021 Decadal Programme of Investment ▪ Preparation of Implementation Plan V2 including full risk matrix ▪ Preparation of a legal agreement for SPREP to host the WRP and a legal and financial framework for the WRP pooled investment fund ▪ Preparation of a strategy for environmental and social safeguards (including GEDSI) for the WRP ▪ Coordination and management of WRP activities while recruitment of Programme Manager is ongoing. 	1	2024	0.55
WRP annual steering committee meetings and support for attendance at PMC Biennial Meetings	5	2024–2028	0.88
SUBTOTAL			10.15

ACTIVITY	DURATION (YEARS)	TIMEFRAME	2023 INDICATIVE COST USD M
KRA 2 PRODUCTION OF FORECASTS AND WARNINGS			
Preparation of a plan and costing for an open source, integrated platform, to analyse and access automated weather and warning products for specific locations. The three components of this platform are:			
<ul style="list-style-type: none"> ▪ Integration of global/ regional/ national models to deliver automated forecasts and warnings ▪ Improved forecasting services in NMHSs ▪ A well-supported delivery platform - the Pacific Weather Exchange 	1	2024	0.10
Establish two-way WMO Information Systems (WIS) allowing NMHS to share their information worldwide	2	2024–2025	0.20
Implementation of coastal inundation forecasting in 2 countries including riverine flood forecasting.	5	2024–2028	4.90
Provision of additional ICT staff in 7 NMHS not aligned with the USA National Weather Service or Meteo France and 2 additional ICT staff in Fiji.	5	2024–2028	3.10
SUBTOTAL			8.30
KRA 3 COMMUNICATION AND DELIVERY OF FORECASTS AND WARNINGS TO END USERS			
Development of a detailed plan and costs for development and delivery of response-based messages and warnings to end-users based on:			
<ul style="list-style-type: none"> ▪ National workshops with NMHS, NDMO, EW4ALL, vulnerable groups and socio-economic sectors to review existing messages and warnings to end-users. ▪ Regional workshop with NDMOs, NMHS, EW4All. 	2	2024–2025	0.66
Installation of internet access equipment and operational costs of selected NMHSs and NDMO e.g Starlink.	2	2024–2025	0.5
Preparation of impact-based, location specific warnings, based on assessments and modelling, and incorporating traditional knowledge and GEDSI considerations especially for the most vulnerable groups such as persons with disabilities, children. In collaboration with EW4ALL.	3	2026–2028	1.00
Delivery of the impact-based messaging, translation into local languages, community engagement, mobile apps, public awareness activities including to those end users with no internet.	3	2026–2028	0.40
Training of NMHSs and NDMO on the WMO Common Alerting Protocol so that messages can be distributed by/on any digital platform.	5	2024–2028	0.10
SUBTOTAL			2.66

ACTIVITY	DURATION (YEARS)	TIMEFRAME	2023 INDICATIVE COST USD M
KRA 4 INFRASTRUCTURE			
Preparation of national observations network plans for country automatic weather stations, including status and upgrades needed, as well as gaps and new installations.	1.6	Nov 2023– June 2025	1.00
Revitalise, upgrade and and expand existing network of automatic weather stations in collaboration with the Systematic Observations Financing Facility.	5	2024–2028	2.00
Preparation of a radar network plan for Tonga and implement the plan as a proof of concept	2	2024–2025	2.50
Establishment of wave rider buoys and establishment of standard operating procedures.	4	2025–2028	2.30
Establishment of staff resource with SPC to coordinate the ocean infrastructure.	5	2025–2028	0.22
Establishment of high accessibility ICT Infrastructure with cybersecurity.	4	2025–2028	0.7
Establish an Instrument Calibration Centre	5	2025–2028	1.86
SUBTOTAL			10.58
KRA 5 CAPACITY AND TRAINING			
Establishment of a Regional Training Centre for the training of observers, technicians and IT specialists	5	2024–2028	0.92
Training of technicians and observers at a regional training centre	4	2025–2028	0.48
Training of forecasters to BIP-M standard	5	2024–2028	1.35
Specialised regional workshops delivered with national and regional partners	4	2025–2028	2.03
Development and delivery of online specialised development workshops.	4	2025–2028	
Establish and deliver a Pacific Meteorology Leadership Programme for mid and senior level staff.	5	2024–2028	0.60
SUBTOTAL			5.38
Project Management costs (Current arrangement between the Government of Australia and SPREP, 15%)			3.00
OVERALL TOTAL			40.07

Implementation Plan for WRP Inception Phase, November 2023– December 2024 (possibly extending into early 2025)

Grant arrangement from the Government of Australia is being progressed for USD 2.18 m and funding from other partners is under negotiation.

Total indicative budget for Inception Phase = USD 7.71 m. Other development partners are invited to invest in the Inception Phase.

The Inception Phase Implementation Plans is based on an overarching principle to address gender equality, disability and social inclusion (GEDSI) goals in all recruitment, training, consultation and all WRP activities.

ACTIVITY	DURATION (YEARS)	TIMEFRAME	2023 INDICATIVE COST USD M
KRA 1 MANAGEMENT AND COORDINATION			
Establishment of PMU core staff, travel for PMU, consultations with NMHS, PMC Panels, Liaison Committee and partners, communication activities	1.6	Nov 2023– June 2025	1.49
Preparatory start-up work to include:			
<ul style="list-style-type: none"> ▪ Preparation of a “Programme of Work” for the WRP to include revision of 2021 Decadal Programme of Investment ▪ Preparation of Implementation Plan V2 including full risk matrix ▪ Preparation of a legal agreement for SPREP to host the WRP and a legal and financial framework for the WRP pooled investment fund ▪ Preparation of a strategy for environmental and social safeguards (including GEDSI) for the WRP ▪ Coordination and management of WRP activities while recruitment of Programme Manager is ongoing. 	1	2024	0.55
WRP annual steering committee meeting and support for attendance at PMC Biennial Meeting	1.6	Nov 2023– June 2025	0.30
SUBTOTAL			2.34
KRA 2 PRODUCTION OF FORECASTS AND WARNINGS			
Preparation of a plan and costs for the development of an integrated forecast platform for the Pacific region together with partners.	1.6	Nov 2023– June 2025	0.10
Preliminary data collection for coastal inundation forecasting in 1 country including riverine flood forecasting.	1.6	Nov 2023– June 2025	0.20
SUBTOTAL			0.30

ACTIVITY	DURATION (YEARS)	TIMEFRAME	2023 INDICATIVE COST USD M
KRA 3 COMMUNICATION AND DELIVERY OF FORECASTS AND WARNINGS TO END USERS			
National consultations with NMHS, NDMO, vulnerable groups and socio-economic sectors to review existing messages and warnings to end-users.	1	Nov 2023– Sep 2024	0.5
Regional workshop with NDMOs, NMHS, EW4All to review existing messaging and develop a plan for preparation and delivery of response based messaging and warnings to end users	0.7	Sep 2024– June 2025	0.16
Development of an engagement strategy to address the needs of specific vulnerable groups e.g. persons with disabilities, children and others.	1.6	Nov 2023– June 2025	0.05
Translation and printing of the COPE initiative books (Helping children COPE with natural disasters and hazards) for 3 countries.	1.6	Nov 2023– June 2025	0.05
Training of NMHSs and NDMO on the WMO Common Alerting Protocol so that messages can be distributed by/on any digital platform.	1.6	Nov 2023– June 2025	0.1
Installation of internet access equipment and operational costs e.g. Starlink in selected countries.	1.6	Nov 2023– June 2025	0.1
SUBTOTAL			0.96
KRA 4 INFRASTRUCTURE			
Preparation of national observations network plans for country automatic weather stations, including status and upgrades needed, as well as gaps and new installations.	1.6	Nov 2023– June 2025	1.00
Development of a regionally defined Principles and Standards for observation, communications and ICT infrastructures to maximise the value of investments.	1.6	Nov 2023– June 2025	0.05
Preparation of a radar network plan for Tonga, and installation of the weather watch radar as a proof of concept .	1.6	Nov 2023– June 2025	2.50
Discuss concept for establishing a staff position in SPC to coordinate the ocean infrastructure.	1.6	Nov 2023– June 2025	
Initiate discussions with partners on establishment of an Instrument Calibration Centre	1.6	Nov 2023– June 2025	
SUBTOTAL			3.55

ACTIVITY	DURATION (YEARS)	TIMEFRAME	2023 INDICATIVE COST USD M
KRA 5 CAPACITY AND TRAINING			
Workshop in Fiji to advance discussions for the establishment of a Regional Training Centre for the training of observers, technicians and IT specialists	1.6	Nov 2023– June 2025	0.02
2 forecasters trained to BIP-M standard	1.6	Nov 2023– June 2025	0.11
Short term capacity development workshops in collaboration with partners (meteorological and hydrological observations, analysis and modelling)	1.6	Nov 2023– June 2025	0.1
Start discussions with regional institution to establish a Pacific Meteorology Leadership Programme for mid and senior level staff	1.6	Nov 2023– June 2025	
SUBTOTAL			0.23
Project management cost, (Current arrangement between Government of Australia and SPREP, 15%)			0.33
TOTAL			7.71

5. Risk Assessment

Risk management is the responsibility of the proposed WRP Steering Committee.

5.1 Risk Assessment (2021)

The 2021 Decadal Programme of Investment document identified the following key risks:

- Lack of legislative and policy frameworks to support NMHSs and/or weak implementation of their strategic plans.
- Limited interaction between NMHSs and NDMOs to ensure delivery of impact messages to end users.
- New infrastructure is not well maintained and fails to deliver expected benefits.
- The proposed approach to cascading forecast development involving global and regional centres and national meteorological services is not accepted by NMHSs.
- Even with comprehensive training programmes in place there is a lack of qualified people to take up all of the new positions proposed.
- Improved impact-based forecasts and warnings do not result in a change to preparedness actions by individuals and communities.
- Complexities of working across a region with different national needs leads to ineffective programme delivery.
- Programme activities are “cherry-picked” by individual donors making it very challenging to maintain programme coherence.
- The benefits of the programme do not endure beyond the decadal period of investment.

5.2 Risk Assessment (2023)

During the preparation of this Implementation Plan, a risk assessment was conducted as a parallel activity. The additional risks are identified below. A revised Implementation Plan (V2) including a full risk evaluation matrix has been identified and costed as an activity to be undertaken at the beginning of the Inception Phase (January to June 2024).

5.2.1 Operational risks

- i. **Institutional and legal entity risks:** WRP is not a legal entity and needs a legal framework for its ongoing operations. The Governance Model adopted by the PMC in August 2023 endorses that WRP be established within SPREP. An agreement between SPREP and the foundation investors in the WRP programme is needed to formalise the basic rules under which SPREP would manage a multi-donor pooled investment fund; and clear acceptance by SPREP of all governance arrangements that have been approved for WRP. (Preparation of this agreement has been included as a costed activity under KRA 1 in the Inception Plan).
- ii. **Governance risks:** The WRP governance structure was adopted on 29th September at a virtual meeting of the PMC. This adds new functions to the existing bodies that comprise the Regional Hub for Meteorological Services in the Pacific. There is a risk that the large membership and duplication of membership across these bodies will negatively impact efficient and timely decision making. (Review of the governance structure has been included on a 2-yearly basis and may need to be bought forward).
- iii. **Existing country level facilities risk:** Existing built infrastructure and services in the countries may not be resilient to natural disasters.
- iv. **Expectational risk:** There is a risk that the WRP will create expectations that exceed its mandate or design.

5.2.2 Financial risks

- v. **Multi-donor pooled investment fund:** The major risks associated with establishing and maintaining a multi-donor pooled investment fund are:
 - Inability to lock-in one or more keystone investors who are willing to fund the establishment of the program until such time as it can clearly demonstrate an acceptable level of “success”.
 - Failure to convince additional investors to “buy-in” to the pooled fund.
 - Countries actively pursuing bi-lateral project funding rather than supporting the collective pooled fund.
 - A weak or ineffective governance structure.

- Disagreements on priorities and work plans.
- Poor or infrequent programmatic and financial reporting.
- Failure to deliver against agreed work plans.
- Host institution support failures.

(Preparation of a financial framework for the Investment facility has been included as a costed activity under KRA 1 in the Implementation Plan).

- vi. **Bilateral projects:** Different projects can result in diversity of equipment types thereby challenging communication, maintenance and sustainability.
- vii. **EW4ALL and the Systematic Observations Financing Facility:** These two initiatives may compete with the WRP pooled investment fund and clash with the aim of WRP to harmonise infrastructure across all NMHSs.
- viii. **Cost escalation due to global inflation and other factors.** (The Implementation Plan is to be reviewed annually).
- ix. **Sustainable funding** is a risk and PICS need to consider increasing their recurrent budget funding.
- x. **Capital equipment replacement** over the 10-year programme is a risk especially for IT equipment.

6. Conclusion

The WRP is an ambitious, forward-looking intervention that has been several years in the making. Recognising that to date funding for only a small percentage of the intervention has been committed, this Implementation Plan and its costings are indicative and require revision and updating on at least an annual basis as new information becomes available and new investments are committed.

Annex 1

Results of Questionnaire Survey sent to Directors of NMHSs

15 September 2023

- Each NMHS Director was asked to prioritise a maximum of 2 priority activities identified in the four technical areas of investment of the 2021 WRP Decadal Program of Investment Document.
- The table below shows the top four priority activities under each KRA after the responses were compiled.
- These results were used as the basis for discussion and prioritisation at the 18–22 September meeting at SPREP.

NUMBER OF PRIORITY RESPONSES		AREA OF INVESTMENT
KRA 2 PRODUCTION OF FORECASTS AND WARNINGS		
1	8	Investment in increased use of remotely generated Numerical Weather Prediction products and satellite data and forecast automation in a cascading forecast process.
2	7	Develop a Pacific Weather Exchange that will centralise all the warning information for the Pacific region
3	7	Develop an open source Integrated Forecast Platform (software) for use by members
4	6	Coastal Inundation Forecast Modelling
KRA 3 COMMUNICATION AND DELIVERY OF IMPACT FORECASTS TO END-USERS		
1	11	Development of technologies to deliver information to remote communities (apps)
2	10	Community-based early warning systems that are socially inclusive and incorporate traditional knowledge
3	8	Investment in impact-based forecasting
4	6	NHMS/NDMO and other sectoral cooperation workshops
KRA 4 INFRASTRUCTURE		
1	9	Weather radars
2	7	Ocean observations
3	6	Equipment for long-term maintenance schedule including spare parts
4	6	A regional instrument and calibration centre

**NUMBER OF
PRIORITY RESPONSES**

AREA OF INVESTMENT

KRA 5 CAPACITY BUILDING AND TRAINING NEEDS

1	8	Training of forecasters to a BIP-M standard
2	6	Establish a Pacific Meteorological Leadership programme
3	5	Support for WMO Regional Training Centre (for observers, technicians and IT specialists)
4	4	Training for electronic technicians in IT skills and data management



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Annex 2

Outline Logical Framework for the Overall Implementation Plan

INDICATORS	BASELINES (2024)	TARGETS (2033)
OVERALL OBJECTIVE		
Pacific Island communities enjoying improved safety, security and prosperity		
Verified evidence (statistical, documentary, social media), compared to previous events before WRP, showing: <ul style="list-style-type: none"> improved safety (fewer people injured) less damages (costs). Number of vulnerable groups responding effectively to warnings. 		tba•
SPECIFIC OBJECTIVE		
Communities, government and industries have the systems, forecasts, warnings and information to enact response plans to extreme weather events and in a timely manner.		
Number of countries with new plans for responding to forecasts and warnings.		5 countries
KEY RESULT AREA 1: MANAGEMENT AND COORDINATION		
<ul style="list-style-type: none"> PMU established and operating effectively and efficiently. Evidence of GEDSI incorporated into WRP, especially KRAs 2, 3, 5. Steering committee meetings held. WRP Decadal Program of Investment document revised and updated. 	tba 0 1	PMU fully resourced by end 2025. tba 10 meetings: 5 face-to-face, 5 virtual +1 (by end 2024)
KEY RESULT AREA 2: PRODUCTION OF FORECASTS AND WARNINGS		
<ul style="list-style-type: none"> The Pacific Weather Exchange developed as an open source, integrated platform, to analyse and access automated weather and warning products for specific locations. Number of automatic weather and warning products developed. Aviation forecasting strengthened in Regional Specialised Meteorological Centres. Coastal inundation forecasting applied in selected countries. 	1 (Met Connect portal) tba tba 1	Pacific Weather Exchange operational tba In one Regional Specialised Meteorological Centre +5 countries

* tba = to be added

INDICATORS	BASELINES (2024)	TARGETS (2033)
KEY RESULT AREA 3: COMMUNICATION AND DELIVERY OF FORECASTS AND WARNINGS TO END-USERS		
▪ Effective coordination mechanism in place between NHMS, NDMO and EW4ALL partners	0	X coordination meetings
▪ Installation of internet access equipment e.g. Starlink	3	+5 countries
▪ Impact-based, location specific, warnings delivered in selected countries		+5 countries
KEY RESULT AREA 4: INFRASTRUCTURE		
Installation of the following:		
▪ Automatic weather stations		tba
▪ River gauges		
▪ Automatic rain gauges		
▪ Automated meteorological balloon launching systems		
▪ Aircraft meteorological data relays		
▪ Radars		
▪ Tide gauges		
▪ Wave buoys		1
▪ Servers and IT infrastructure		
▪ Forecaster work stations		
▪ Workshops		
▪ Equipment Calibration Centre		
KEY RESULT AREA 5: CAPACITY AND TRAINING		
▪ Pacific Meteorology Leadership course established for mid and senior level staff and delivered.	0	60 participants trained
▪ Number of women and persons with disabilities trained.	0	
▪ Regional training centre established		1
▪ Technicians and observers trained		50 trained
▪ Forecasters trained to BIP-M standard		30 trained
▪ Hydrology and hydrography training delivered		tba
▪ Professional workshops delivered		tba

Annex 3

Outline Logical Framework for the Phase 1 Implementation Plan

INDICATORS	BASELINES (2024)	TARGETS (2033)
OVERALL OBJECTIVE		
Pacific Island communities enjoying improved safety, security and prosperity		
Strengthened regional and national severe weather forecasts supported by enhanced hydrometeorological infrastructure networks and improved capacity of NMHS technicians.		tba*
SPECIFIC OBJECTIVE		
Communities, government and industries have the systems, forecasts, warnings and information to enact response plans to extreme weather events and in a timely manner.		
<ul style="list-style-type: none"> Number of countries with preliminary plans in place for responding to forecasts and warnings. Number of vulnerable groups responding effectively to warnings. 		3 countries
KEY RESULT AREA 1: MANAGEMENT AND COORDINATION		
<ul style="list-style-type: none"> PMU established and operating effectively and efficiently. Evidence of GEDSI incorporated into WRP, especially KRAs 2,3, 5. Steering committee meetings held. WRP Decadal Program of Investment document revised and updated. 		PMU core team resourced by end 2025. tba 5 meetings: 3 face-to-face, 2 virtual +1 (by end 2024)
KEY RESULT AREA 2: PRODUCTION OF FORECASTS AND WARNINGS		
<ul style="list-style-type: none"> Two-way WMO information systems (WIS) in place allowing NMHS to share information worldwide. Coastal inundation and riverine forecasting applied in selected countries. Additional staff in place in NHMS 	tba tba	+2 countries. +16 (2 in Fiji, 1 in each NMHS except for those aligned with US National Weather Service and Meteo France.)

* tba = to be added

INDICATORS	BASELINES (2024)	TARGETS (2033)
KEY RESULT AREA 3: COMMUNICATION AND DELIVERY OF FORECASTS AND WARNINGS TO END-USERS		
▪ Effective coordination mechanism in place between NHMS, NDMO and EW4ALL partners	10	X coordination meetings
▪ Installation of internet access equipment, e.g. Starlink.	3	25 installations
KEY RESULT AREA 4: INFRASTRUCTURE		
Installation of the following:		
▪ Automatic weather stations		33
▪ Radars		tba
▪ Wave buoys		10
▪ Servers and IT infrastructure		tba
▪ Equipment Calibration Centre		1
KEY RESULT AREA 5: CAPACITY AND TRAINING (AND ADDRESSING GEDSI CRITERIA)		
▪ Pacific Meteorology Leadership course established for mid and senior level staff and delivered.	0	30 participants trained
▪ Number of women and persons with disabilities trained.	0	1
▪ Regional training centre established		30
▪ Technicians and observers trained		30
▪ Forecasters trained to BIP-M standard		tba
▪ Hydrology and hydrography training delivered		tba
▪ Professional workshops delivered		

Annex 4

Project Management Unit Staff Costings for the Overall and Phase 1 Implementation Plans

PMU Staff Costing for the Overall WRP, 2024–2033

POSITION	NUMBER OF YEARS	TIMEFRAME (YEARS)	TOTAL USD
a. Programme Manager	10	2024–2033	2,131,152
b. Technical Adviser Forecast Production & Forecast Communication	8	2025–2033	1,401,328
c. Technical Adviser Infrastructure & Capacity/Training	10	2024–2033	1,751,660
d. Financial Accountant	10	2024–2033	1,751,660
e. Finance and Administration Officer	10	2024–2033	1,358,220
f. Finance and Administration Assistant	8	2025–2033	319,127
g. Communications Officer	9	2025–2033	1,222,398
h. Monitoring, Evaluation, Research, Learning and Adapting Officer (MERLA)	9	2025–2033	1,222,398
i. Environmental and Social Safeguards Officer (includes Gender Equality, Disability and Social Inclusion functions (GEDSI))	9	2025–2033	1,222,398
j. Resource Mobilisation Officer	8	2026–2033	1,158,552
k. PMC Secretariat Technical Support Officer	9	2025–2033	1,303,371
TOTAL			14,842,264

Positions (a) (c) (d) (e) represent the PMU core team who will be recruited over the period November 2023 to mid-2024; other PMU positions may be recruited as necessary in Phase 1: (noting that positions may be renamed, split and additions may be made to the list, e.g. addition of IT expertise)

PMU Staff Costing for the Phase 1 WRP, 2024–2028

POSITION	NUMBER OF YEARS	TIMEFRAME (YEARS)	TOTAL USD
a. Programme Manager	5	2024–2028	1,034,540
b. Technical Adviser Forecast Production and Forecast Communication	4	2025–2028	700,664
c. Technical Adviser Infrastructure & Capacity Training	5	2024–2028	875,830
d. Finance Accountant	5	2024–2028	875,830
e. Finance and Administration Officer	5	2024–2028	679,110
f. Finance and Administrative Assistant	4	2025–2028	155,564
g. Communications Officer	4	2025–2028	543,288
h. Monitoring, Evaluation, Research, Learning and Adapting Officer (MERLA)	4	2025–2028	543,288
i. Environmental and Social Safeguards Officer (includes Gender Equality, Disability and Social Inclusion functions (GEDSI))	4	2025–2028	543,288
j. Resource Mobilisation Officer	3	2026–2028	434,580
k. PMC Secretariat Technical Support Officer	4	2025–2028	579,440
TOTAL			6,965,422

Positions (a) (c) (d) (e) represent the PMU core team who will be recruited over the period November 2023 to mid-2024; other PMU positions may be recruited as necessary in Phase 1: (noting that positions may be renamed, split and additions may be made to the list, e.g. addition of IT expertise).



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