CREWS Project Presentation Note to the Steering Committee		
Project Title	Drought Resilience and Early Warning (DREW) Pacific Project	
Document Reference	CREWS/RProj/20/Pacific Drought	
Geographic coverage	Pacific Small Island Developing States (SIDS): Cook Islands, Kiribati, Papua New Guinea, Samoa, Tokelau, Tuvalu, and Vanuatu.	
Timeframe	2026 – 2029	
Total CREWS Contribution	US$ 5,650,000	
Lead Implementing Partner	World Meteorological Organization (WMO)	
	a. Execution	US$ 5,000,000.00
	b. Fees	US$ 650,000.00
	c. Total	US$ 5,650,000.00
Main objective(s)	Improving community-focused, integrated early warning systems and actions (EWSA) for drought in Pacific Islands Countries to enhance decision-making and reduce drought impacts.	
Project Recipient/ Beneficiary *(people and organisations at risk who are the intended beneficiaries of the project at impact level)*	The primary beneficiaries of this project are the approximately **11.3 million** people living in the participating Pacific Small Island Developing States (SIDS), which include **Papua New Guinea**, **Samoa**, **Tuvalu**, **Vanuatu**, **Tokelau**, **Cook Islands**, and **Kiribati** (Worldometers, 2025[1]). These countries are increasingly vulnerable to climate-related hazards, including droughts, which exacerbate food and water insecurity, disrupt livelihoods, and heighten risks to health and well-being. These communities will benefit from enhanced **early warning systems (EWSs)**, increased preparedness, and strengthened response capabilities, ultimately improving their resilience to climate-related impacts. According to the World Bank Group classification of these countries[2], three countries (Kiribati, Papua New Guinea and Vanuatu) are Low Middle-Income Countries (LMIC) and two countries (Samoa and Tuvalu) are Upper Middle-Income Countries. Moreover, Kiribati, Papua New Guinea and Tuvalu are categorized by the World Bank Group[3] as Fragile and Conflict affected situation countries mainly on institutional and social fragility; the CREWS Operational Procedure for Programming in Fragile, Conflict and Violence Setting is guiding the implementation in these countries[4]. The project will involve a range of key stakeholders to ensure its successful implementation; this includes the following: • **National Meteorological and Hydrological Services (NMHSs).** • **Regional Specialized Meteorological Centre (RSMC) Nadi.** • **National Disaster Management Offices (NDMOs).**	

[1] https://www.worldometers.info/population/countries-in-oceania-by-population
[2] https://datahelpdesk.worldbank.org/knowledgebase/articles/378834-how-does-the-world-bank-classify-countries
[3] https://www.worldbank.org/en/topic/fragilityconflictviolence/brief/classification-of-fragile-and-conflict-affected-situations
[4] CREWS FCV Operational Procedures draft_Final.docx

	• **Line Ministries**: Various government departments, including those responsible for health, tourism, agriculture, and infrastructure, will be engaged in the early warning value chain. • **Non-Government Organizations (NGOs) including National Red Cross Societies (NRCSs)**: Vital for community outreach, education, and capacity development, ensuring that local communities are reached and assisted to be well-prepared for drought events. NMHSs and NDMOs have put in place working arrangements with NGOs including NRCSs working together in the early warning value chain. For example, Solomon Islands NMHS have signed a Memorandum of Understanding (MoU) with the NRCS. In Samoa, NDMO, NMHS and other government agencies collaborate under the Community Disaster and Climate Risk Management (CDCRM) framework. The Community Based Early Warning System (CBEWS) implemented through previous Pacific CREWS projects are speared-headed by NRCSs. • **Organizations for persons with disabilities, children, youth, and women's groups**: Ensure that disaster preparedness and response strategies are inclusive and consider the people with special needs. • **Local Communities**: The direct beneficiaries will work with WMO, NMHSs, NDMOs, NGOs including NRCSs and other governments' line ministries to develop community-focused, integrated early warning system and action (EWSA), and receive the necessary training, tools, and resources to effectively respond to drought events and adapt to long-term climate variability.	
Additional Operational Partners ***(intended direct beneficiaries of the project in the form of increased capacity, products and services the project will deliver)***	This project will partner with key national, regional, and international organisations that will benefit from strengthened drought early warning systems (EWSs) and services. These partners will be equipped with enhanced resources, better tools for monitoring drought conditions, and improved coordination mechanisms, ensuring more effective coordinated drought management and response. The main partners involved are: • Australian Bureau of Meteorology (BoM) • Earth Science New Zealand • Secretariat of the Pacific Regional Environment Programme (SPREP) • Pacific Community (SPC) • Pacific Disability Forum (PDF) • Indonesia Meteorology, Climatology and Geophysics Agency/Badan Meteorologi, Klimatologi, dan Geofisika (BMKG) • United Nations Office for Disaster Risk Reduction (UNDRR)	
Initial state of play	a. Vulnerability, exposure to risks, disasters impacts (on people and economy)	The Pacific Small Island Developing States (SIDS) involved in this regional project—Cook Islands, Papua New Guinea (PNG), Samoa, Kiribati, Tokelau, Tuvalu, and Vanuatu—are highly vulnerable to the impacts of climate-related hazards. Collectively, these countries have a total population of approximately 11.5 million in 2025 (Worldometer, 2025[5]). These nations face considerable challenges due to their small, fragile economies, geographic isolation, and limited resources. While income levels vary, most countries have a GDP per capita of less than US$ 5,000, with

[5] Worldometer (2025). *Pacific Islands Population*. Retrieved from https://www.worldometers.info/world-population/pacific-islands-population/

		Kiribati and Tuvalu being classified as Least Developed Countries (LDC) (UNDP, 2024[6]). These challenges are further exacerbated by their dispersed populations, diverse cultures, and constrained capacity to manage disaster risks and climate resilience effectively. According to the IPCC's Sixth Assessment Report (2022), Pacific SIDS are projected to face increased frequency and intensity of climate hazards, including droughts, due to the ongoing impacts of climate change. Meanwhile, these nations are highly reliant on agriculture, such as in PNG where 85% of the population depends on subsistence farming. Prolonged droughts therefore have devastating impacts on food security, water availability, and livelihoods. For example, the 2015-2016 El Niño event caused widespread drought in PNG, affecting 40% of the population and leading to severe food shortages (SPC, 2024[7]). Based on its vulnerability to drought, PNG benefitted from a CREWS project to enhance drought monitoring and related early warning systems from 2017 to 2023. These climate extremes often lead to national states of emergency, such as Tuvalu's declaration of a state of disaster in 2011 due to a La Niña-induced drought (SPREP, 2011[8]). These events highlight the critical need for robust EWSs to improve preparedness and response capabilities in the face of drought and impacts, and other climate-related hazards. The economic consequences of these disasters are significant. Eight of the top 20 countries with the highest disaster losses, scaled by GDP, are Pacific SIDS. On average, the region faces annual economic losses from natural hazards estimated at US$ 284 million, with losses ranging from 2.6% to 28% of national GDPs (SPC, 2024). These figures emphasize the urgent need for improved disaster risk management (DRM) and climate change adaptation (CCA) measures, particularly for droughts, which severely affect agricultural-based economies in these countries. Similarly, tourism—another key economic driver for several Pacific SIDS such as the Cook Islands, Vanuatu, and Samoa—is highly vulnerable to climate-related hazards, particularly drought. Water shortages and heat stress, for example, can disrupt tourism operations and affect visitor experiences. Integrating the tourism sector into EWSs is vital to help operators anticipate disruptions, manage resources more effectively, and build climate resilience within this important sector. The impacts of drought in the region threaten food security and economic stability and key livelihood sectors such as agriculture, fishery and tourism. These impacts exacerbate the vulnerability of communities dependent on natural resources and climatic

[6] UNDP (2024). *Least Developed Countries (LDCs)*. Retrieved from https://www.undp.org/
[7] SPC (2024). *Pacific Community (SPC) - Disaster Risk Management and Climate Change*. Retrieved from https://www.spc.int/
[8] SPREP (2011). *Pacific Islands' Climate Change Adaptation & Disaster Risk Management*. Retrieved from https://www.sprep.org/

		conditions. Strengthening EWSs and Actions (EWSA) and DRM practices is crucial to building resilience and reducing the economic and social consequences of future drought events.
	b. Status of the EWS, DRM institutions and NHMSs, actors / players present	National Meteorological and Hydrological Services (NMHSs) play a central role in providing weather and climate information, which is critical for the effective operation of national EWSs. Alongside NMHSs, agencies such as National Disaster Management Offices (NDMOs), National Red Cross Societies, non-governmental organizations (NGOs), media services, and community-based organizations/civil society organizations (CBOs/CSOs) are key contributors to the operationalization and maintenance of these systems. Strengthening the capacity of NMHSs in climate extreme monitoring, prediction, and drought monitoring is a key priority for the project. In Pacific SIDS and Pacific Island Countries (PICs), surface-based observation networks for climate monitoring are limited and sparsely distributed. For instance, the PNG National Weather Service (PNG NWS) operates a monitoring network consisting of just 13 weather and climate stations, 7 rain gauge stations, and 5 agrometeorological stations across a vast territory of 450,000 km². This network is insufficient to provide accurate and comprehensive precipitation monitoring across the country. The CREWS-PNG project (2018–2022) sought to address some of these challenges by improving the spatial coverage of precipitation observations, leveraging space-based technologies through the World Meteorological Organization's (WMO) Space-based Weather and Climate Extreme Monitoring (SWCEM) initiative (CREWS-PNG Report, 2022[9]). Despite advances in predicting weather, water, and climate extremes, significant challenges remain. A recent stocktake of EWSs in the Pacific, commissioned by the Australian Government Department of Foreign Affairs and Trade (DFAT**)**, highlighted ongoing capacity gaps. While coverage of multi-hazard EWSs (MHEWSs) has improved, gaps remain in operationalization, maintenance of observation networks, and data quality. These findings were confirmed during the EW4All regional workshop and the CREWS Pacific 2.0 Steering Committee meetings held in April 2024, as well as through national EW4All rollout workshops in the Pacific (DFAT Stocktaking Report, 2024[10]). The challenges highlighted included inadequate infrastructure, poor data exchange, and insufficient integration of EWSs at the community level. In the context of drought monitoring and EWSs in Pacific SIDS have been enhanced in terms of detecting and forecasting

[9] CREWS Initiative, *CREWS-PNG Project Progress Report, July–December 2022*, https://crews-initiative.org/wp-content/uploads/2024/12/CREWS-PNG-Project-Progress-Report-July-Dec-2022.pdf.

[10] Australian Government Department of Foreign Affairs and Trade (DFAT), *Stocktaking Report on Early Warning Systems in the Pacific (2024)*, https://www.preventionweb.net/files/68266_682309pngdrmstatusreport.pdf.

		weather and climate hazards. However, drought, both hydrological and meteorological, remains underrepresented in current systems. This gap presents a challenge, as existing EWSs often fail to trigger effective responses to drought-related impacts, such as water scarcity and food insecurity. Furthermore, while early warning products and services are becoming more sophisticated, they are often not accessible to all, particularly vulnerable groups such as people with disabilities. The integration of gender, disability, and social inclusion into the design and implementation of EWSs has been inadequate. Collaboration with organizations like the Pacific Disability Forum (PDF) ensures the inclusion of persons with disabilities participating in the early warnings and actions value chain, though more needs to be done to make these systems more inclusive (PDF, 2024). Moreover, the Pacific's vast geographical expanse and remote islands pose a significant challenge in forecasting and monitoring of weather events and effectively disseminating early warnings, particularly for droughts. Even when warnings are disseminated and understood, systems that lead to effective actions are often absent, particularly at the community level. Community engagement in the development of user-tailored warnings is critical, as it ensures that warnings are not only comprehensible but also actionable (EW4All Pacific Workshop, 2024). Currently, EWSs for drought and food insecurity are in place, but their capacity to trigger timely and coordinated responses is limited. The absence of systematic risk assessment and mapping of high-risk areas for drought in many countries exacerbates the challenges. There is also a lack of centralized information that systematically documents the risks and impacts of drought, limiting the effectiveness of national DRR and DRM strategies (CREWS-PNG Report, 2022). In terms of capacity development, there is an urgent need to enhance the human resource base for NMHSs, and other institutions involved in generating, disseminating, and utilising risk information and early warnings. A shortage of skilled professionals capable of maintaining and interpreting advanced technical infrastructure is a significant barrier to effectively utilise available data and tools. These capacity gaps undermine the effectiveness of available EWSs and hinder DRR efforts (DFAT Stocktaking Report, 2024).
	c. Projects and programs dealing with EWS and hydromet under implementation or preparation	The project will complement and scale up the following projects and programmes implemented at the regional and national levels. **Ongoing and Approved Projects** • **Climate and Oceans Support Program in the Pacific (COSPPac)** – AU$ 30M, 2023–2029. COSPPac is a core component of Australia's support to reduce climate

		impacts in the Pacific, working with 15 countries to strengthen climate and ocean monitoring, forecasting, and communication. The DREW Pacific project complements COSPPac by focusing on drought-specific EWSs and impact-based services. The DREW Pacific project will build on COSPPac's established platforms (e.g. Pacific Island Climate Outlook Forum (PICOF), Pacific Island Hydrology Outlook Forum (PIHOF), National Climate Outlook Forum (NCOF)), delivering drought and water availability information products for the tourism, water and agriculture sectors, improved multi-source weighted ensemble precipitation (MSWEP) drought deficiency products, Early Action Rainfall (EAR) watch bulletins, support for climate data rescue, and enhanced standard operating procedures (SOPs) and training across seven Pacific SIDS. This alignment creates strong opportunities to scale up COSPPac's reach while integrating drought resilience into community and sectoral planning. • **Intra-ACP Climate Services and Related Applications Programme ClimSA Pacific region** – The ClimSA programme has a total budget of EUR 85 million for global implementation under the intra ACP Cooperation funded by the European Union (EU). Out of the global envelope, the Pacific component of ClimSA is EUR 9 Million implemented by SPREP. The project focuses on five key result areas: (i) structuring interaction between users, researchers, and climate service providers; (ii) ensuring effective provision of climate services at regional and national levels; (iii) improving access to climate information; (iv) enhancing capacity to generate and apply relevant climate products; and (v) mainstreaming climate-informed decision-making into policy processes. ClimSA targets Kiribati, Nauru, Tonga, and Samoa, prioritizing agriculture and DRR. The CREWS DREW Pacific project complements ClimSA by focusing on the development and implementation of drought management plans in Samoa and Kiribati, supporting community engagement, capacity development, and application of drought early warning services, thereby strengthening resilience and CCA efforts in these countries. • **CREWS Vanuatu Accelerated Support Window (ASW)** – The CREWS ASW for Vanuatu, of US$ 250,000, aims at assessing the accuracy of warnings issued during Tropical Cyclones Judy and Kevin as well as other hazards and their impacts on Vanuatu's MHEWS. The assessments that will be produced under the project will inform the national EW4All roadmap that will highlight

		VMGDs key priorities that the DREW Pacific Project will enable and deliver on. • **The Weather Ready Pacific Programme (WRPP)[9]**, a decadal programme providing the overarching programmatic framework for meteorology's priorities and coordination in the Pacific region with funding commitments from Australia of AU$ 30 million, from New Zealand of NZ$ 20 million and from the UK Met Office – Weather and Climate Information Services (WISER) Programme of GB£ 300,000, supporting priority activities in 2024 since its inception in mid-2023. The WRPP focuses on the following 5 key result areas (i) Management and coordination, (ii) Production of forecasts and warnings; (iii) Communications and delivery of forecasts to end users; (iv); Infrastructure; (v) Capacity development and training. The CREWS SIEWAP (see below) jointly with WRPP will support the establishment of the Regional MHEWS Technical Working Group (TWG) to coordinate EWS-related initiatives in the Pacific. This TWG will be used for sharing information, coordinating, and complementing EWSs' projects. Furthermore, CREWS DREW Pacific project will complement activities implemented by the WRPP such as the Common Alerting Protocol (CAP) and the WMO Information System (WIS2.0) implementation where WRPP is covering 7 countries and CREWS DREW Pacific project will support an additional 2 countries and vice-versa by sharing information regularly, through joint country missions and joint planning in its technical committee weekly meetings and project steering meetings. Through the WRPP, countries will receive support in the procurement of instrumentation to improve monitoring. To scale up efforts and to fill gaps, the project will complete these efforts through technical calibration support, improvement of selected climate/hydrology stations, and ensuring Global Basic Observation Network (GBON) requirements are taken into consideration. • **The Green Climate Fund (GCF) is providing a 49.9 million US$ project titled** Enhancing Climate Information and Knowledge Services for resilience in 5 Island Countries of the Pacific Ocean (CIS-Pac5 Program). A 6-year (2020-2026), US$ 49.9 million GCF funded program and implemented by UNEP. The participating countries are the Cook Islands, Niue, Palau, Marshall Islands, and Tuvalu. The programme results including (i) Strengthened delivery model for climate information services and MHEWSs covering oceans and islands; (ii) strengthened

		observations, monitoring, modelling, and prediction of climate and its impacts on ocean areas and islands; (iii) improved community preparedness, response capabilities and resilience to climate risks; and (iv) enhanced regional knowledge management and cooperation for climate services and multi-hazard early warning systems. The CREWS DREW Pacific project will complement CIS-Pac5 in the Cook Islands and Tuvalu by addressing critical gaps in drought-specific monitoring and response, which were not a core focus of the current GCF project. It will also advance the implementation of WIS 2.0 and support the development of national drought management plans, leveraging CIS-Pac5's established infrastructure and partnerships to enhance targeted early warning capabilities. • **Climate Information Services for Resilient Development in Vanuatu (Van CIS RDP)**, also known as Van-KiRAP, is implemented by SPREP and focuses on (i) capacity development; (ii) user interface platform; (iii) climate information services system; (iv) observations and monitoring; and (v) research, modelling and prediction. It is a US$ 19.854 million GCF Funded project. The Drought Pacific project will complement the activities of the Van-KiRAP GCF project through the development of its Drought Management plan and state of the climate report as well implement WIS 2.0 and training opportunities. • **The Systematic Observations Financing Facility (SOFF)** – Supports countries to generate and internationally exchange basic weather and climate observations and ensure GBON compliance. SOFF has approved support for 14 PICs amounting to US$ 33 million. SOFF hands-on, peer-to-peer technical assistance in the Pacific is provided by the Australian Bureau of Meteorology (BoM), Met Service New Zealand and UK Met Office. Presently two Pacific SIDS, namely Solomon Islands (US$ 8,488,524) and Kiribati (US$ 11,155,102) have reached the investment phase, meanwhile Samoa (US$ 5.28 million and Nauru (US $ 6,194,529) have been conditionally approved. and disburse to them to implement SOFF; and the Implementing Entities (IE) are UNDP, UNEP and World Bank (WB), respectively. SOFF investment focuses and deploys a global approach with international data exchange, innovative finance for sustainable Global Basic Observing System (GBON) compliance and technical competency and coordination. CREWS DREW Pacific Project will add value to this by complimenting and adding drought monitoring and early

		system such as for soil moisture, soil temperature to the SOFF funded GBON stations in these countries. • **Scale up Inclusive Early Warning and Action in the Pacific (SIEWAP)** Project, also referred to as the third phase of the CREWS Pacific SIDS project is a four-year, US$ 5.6 million regional initiative led by WMO in partnership with UNDRR to enhance people-centred, end-to-end multi-hazard early warning systems across Pacific SIDS. Aligned with EW4All and WRPP, SIEWAP supports improved forecasting, institutional capacity, inclusive communication, and community-based preparedness. It offers strong co-financing potential with the CREWS DREW Pacific project in areas such as Women in Leadership in Science (WILS), implementation of WIS 2.0, expansion of impact-based forecasting and warning services (IBFWS), and operationalization of CAP. • PACIDFIN **Pipeline Projects/Programmes** • **Pacific Region Preparedness, Adaptation and Resilience (PREPARE**) – Samoa Project. US$ 30 million IDA21 + SOFF US$ 5.28 million. This project aims to strengthen Samoa's capacity to manage the impacts of natural hazards and enhance resilience, particularly in vulnerable urban areas. It focuses on improving hazard monitoring and EWSs, enhancing emergency preparedness and response, and upgrading critical lifeline infrastructure to better withstand climate and disaster risks. In support of these goals, the project will assist the Samoa Meteorology Division in upgrading facilities and monitoring stations, building technical capacity through targeted training for meteorology, hydrology, and technical staff, and delivering IBF products. These activities are well aligned with CREWS DREW Pacific project, which includes the development of training modules for hydrology technicians, as well as support for the implementation of WIS 2.0, CAP, and the IBF visualisation tool. • **Upgrading Hydrological Services for Climate Resilient Water Security in the Pacific SIDS –** proposal through SPREP for the focus countries -Niue, Fiji, Samoa, Solomon Islands, Tonga, and Vanuatu. It has 3 components that include strengthening regional coordination mechanisms for National Hydrological Services (NHSs), capacity development, and community engagement and awareness. The CREWS DREW Pacific project will support the development of the Pacific Regional Hydrology Strategy that could contribute to this pipeline proposal.

		• **PACIDFIN** - The Project strengthens regional cooperation between the Finnish Meteorological Institute, Pacific SIDS weather services, and Indonesia's BMKG to improve sustainable weather, climate, and disaster warning services. It focuses on enhancing forecasting and early warning capabilities, advancing remote-sensing monitoring, and building BMKG's capacity in air quality and greenhouse gas observations. The project supports countries across the Pacific—including CKI, FSM, Fiji, Kiribati, RMI, Nauru, Niue, Palau, PNG, Samoa, Solomon Islands, Tonga, Tuvalu, and Vanuatu—alongside Indonesia and the Philippines. • **GCF SAP - CREWS Scale-Up Framework for EWS** will support Fiji including ongoing discussions with Kiribati, Samoa, Solomon Islands, Tonga and Vanuatu, for up to US$ 25 million per country. Currently, consultations with the Governments and relevant agencies are under way. • **SOFF** – Pipeline status for the Pacific is as follows: • Kiribati - investment implementation includes: → Strengthening the meteorological network, including upgrade of existing 5 surface-based stations, upgrade 9 staffed stations and co-locating AWS, upgrade of 1 upper-air sounding station and installation of 2 new ones; → Uplifting communications, IT network and data management system to ensure that data is shared through WIS2.0 network; → Enhancing institutional capacity of KMS, including drafting a new gender policy, establishing a stakeholder engagement plan for more systematic engagement of various stakeholders including private sector and CSOs, organizing gender and stakeholder engagement workshops; → Recruitment of new observers, ICT and project management staff for 5 years of project implementation; → Supporting substantial technical training and capacity development activities for KMS staff, as well as providing opportunities for regional collaboration; → Supporting operations and maintenance of the equipment during the 5 years of project implementation. • PNG- investment funding is under review; and • Vanuatu and Tuvalu- readiness phase is ongoing.
	d. Describe the multiplier /leveraging potential of the CREWS investments	With the various investments ongoing in the Pacific, careful consideration has been given to the projects and programmes mentioned above to avoid duplication or repetition while creating synergies and alignment with the WRP.

		With strong alignment to global initiatives and frameworks such as the EW4All Initiative, the Sendai Framework for DRR 2025-2030, and the Sustainable Development Goals (SDGs), the CREWS DREW Pacific project presents substantial leveraging potential by complementing and scaling up over US$ 200 million in ongoing investments across the Pacific region. It builds on established programmes such as COSPPac by co-developing drought-specific products and services for the tourism sector, enhancing MSWEP-based monitoring, and supporting data rescue and training across seven Pacific SIDS. It complements the EU-funded ClimSA programme by advancing drought management planning and community engagement in Samoa and Kiribati. This project builds upon the successes and lessons learned from the implementation of the PNG-CREWS Project. Owing to its positive outcomes, several components of the PNG-CREWS Project have been integrated into the COSPPac and WRP programmes. To ensure strong synergies during implementation, the components and outputs of the CREWS DREW Project that align with the PNG-CREWS Project will be delivered by the Australian Bureau of Meteorology (BoM), ensuring coherence with COSPPac's work on drought monitoring and early warning systems. Moreover, the project strengthens synergies with the GCF-funded CIS-Pac5 and Van-KiRAP projects by filling critical drought preparedness and monitoring gaps, while aligning with WRP to co-deliver WIS 2.0, CAP, and IBFWS. In PNG, it reinforces efforts on climate data rescue and drought risk communication, further expanding regional resilience. By integrating innovative artificial intelligence (AI) tools for early warning visualization, risk mapping, and data-driven decision support, the CREWS DREW Pacific project enhances the accuracy and timeliness of alerts, empowering decision-makers, vulnerable communities and persons with special needs. The project fosters long-term sustainability through targeted capacity building, institutional strengthening, and multi-stakeholder coordination, including private sector engagement and community-led resilience initiatives. Strong regional coordination mechanisms, such as technical working groups and data-sharing platforms, will ensure knowledge exchange and harmonization of early warning standards. The CREWS DREW Pacific project is designed as a scalable model that can be replicated across PICs and other vulnerable regions, driving broader adoption of anticipatory action (AA) approaches such as parametric insurance cover for drought. The parametric microinsurance cover for drought in Kiribati for farmers and individuals is based on lack of rainfall. The CREWS DREW Pacific project will help Kiribati Meteorological Service (KMS) to continue to enhance its capacity to predict potential of drought based on rainfall information to support the Kiribati parametric microinsurance cover for drought.

		Ultimately, by embedding drought EWSs within national CCA and DRR frameworks, the project leverages complementary initiatives and maximizes impacts, delivering sustainable benefits for Pacific SIDS while supporting their commitments under global climate change, DRR and development agendas.
	e. Describe measures to ensure coherence with existing initiatives	To maintain strong alignment and coordination with existing efforts at the regional, national, and global levels, the DREW Pacific project will implement several key measures: 1. **Regular Coordination and Governance** – The project will leverage from steering committee and other governance meetings of initiatives like the CREWS SIEWAP project, WRPP, EW4All, COSPPac, and other relevant regional programmes/projects. These coordinated meetings will enable shared progress tracking, resource harmonization, and collaboration to ensure activities respond effectively to regional and national early warning priorities. 2. **Strategic Partnerships and Co-location** – With project management based within SPREP alongside programs such as COSPPac, Van-KiRAP, CIS-Pac5, and ClimSA, and supported by the WMO Representative Office for South-West Pacific in Apia, the project benefits from a collaborative environment. This facilitates seamless engagement with governments, United Nations (UN) agencies, regional bodies, and NGOs, promoting integrated implementation across overlapping thematic areas. 3. **Aligned Annual Planning** – The project will work closely with partners to jointly develop and coordinate annual calendar of events/activities. This ensures alignment of project interventions with wider regional and national goals and opens avenues for co-financing of shared training and capacity development activities and/or opportunities. 4. **Utilising Established Coordination Platforms** – The CREWS DREW Pacific project will engage existing regional forums such as the Pacific Meteorological Council (PMC), PICOF, PIHOF, WMO Regional Association V (South-West Pacific) (RA V) Working Groups and the AA Community of Practice (CoP). In addition, the project will contribute to the Pacific Partners Coordination Mechanism (PPCM) where all Pacific data and information on public financing is captured and shared publicly for all to utilise for planning and decision making. These platforms will be key for information sharing, collaboration, and harmonization of efforts. 5. **Synergised Capacity Development** – Building upon existing capacity development efforts under CIS-Pac5, COSPPac, SOFF, and WRPP, the project will support joint trainings focused on drought early warning, climate

		services, hydrometeorological technologies, and gender-responsive early warning approaches. This collaboration will optimize resources and foster sustainable skill development among stakeholders. 6. **Promoting Knowledge Exchange and Innovation** – The CREWS DREW Pacific project will facilitate ongoing knowledge sharing across the Pacific, encouraging adoption of innovative tools and technologies, including AI-driven drought forecasting and monitoring systems. This work will be further strengthened by leveraging the experience of the WMO HydroHub in facilitating the uptake of innovative hydrometric technologies by NMHSs. In particular, the HydroHub Innovation Call implemented by Fiji provides a practical of how innovation was be mobilised at national level and scaled across the region. Building on these experiences, the project will enhance collective understanding and support Anticipatory Action (AA) and Disaster Risk Reduction (DRR) efforts. 7. **Alignment with National and Global Frameworks** – The project's design aligns closely with countries' National Adaptation Plans, National Determine Contributions (NDCs), the Sendai Framework, and the SDGs, embedding activities within existing policy and strategic frameworks to ensure coherence and long-term sustainability.
Project Rationale	a. Who, where and in what ways and to what hazards people and ecosystems are exposed and vulnerable	In the Pacific region, communities and ecosystems are increasingly vulnerable to the impacts of climate-related hazards, particularly drought. Droughts, while less visible than sudden-onset hazards like cyclones, have wide-ranging and long-lasting consequences for water security, food systems, public health, and livelihoods. Island nations such as Kiribati, Tuvalu, Tokelau, Samoa, and PNG are especially at risk, with populations depending heavily on rainwater harvesting, shallow aquifers, and coastal ecosystems. According to the WMO State of the Climate report in the South-West Pacific 2024, the recent 2023–2024 El Niño event—one of the strongest on record—triggered widespread and severe drought across the equatorial Pacific, with critical water shortages reported in Tuvalu and Kiribati and significant rainfall deficits observed in Papua New Guinea and the northern Cook Islands (*WMO, 2024, p.22*). Vulnerability to drought in these countries is intensified by geographic isolation, limited water sources and infrastructure, and socioeconomic pressures such as overcrowding, poverty, and dependence on subsistence agriculture. Many low-lying atolls lack natural freshwater sources and rely on rainwater harvesting, which becomes unreliable during prolonged dry periods. This challenge is further amplified by changing weather patterns driven by climate variability and phenomena such as the El Niño–Southern Oscillation (ENSO), which can significantly alter rainfall distribution and intensity. Even small-scale microclimate

		conditions, when coupled with drought, can magnify impacts—leading to localized water shortages and stress on agriculture and ecosystems. The WMO report notes increasing salinization of freshwater lenses in these regions, further threatening potable water access. Moreover, ecosystems such as coral reefs and mangroves, vital for coastal protection and fisheries, are experiencing degradation due to marine heatwaves and ocean acidification—impacts that are compounded during drought by elevated water temperatures and reduced runoff. The combination of climate stressors reduces ecosystem resilience and undermines critical services upon which communities depend. The people most affected by drought in the Pacific include those in rural and remote areas, women, girls, children, youth, elderly people, persons with disabilities including persons with limited mobility, limited vision, limited hearing, and those reliant on climate-sensitive sectors like agriculture, fisheries, and tourism. In Cook Islands, they are about 16.7% (2,911) disability persons (5 years and above) of the total population of 17,432[11]; in Kiribati, about 5.6% (5,558) persons with disability (5 years and above) of a total population of 99,466[12]; in Papua New Guinea, about 19.9% (2,049,700) disability persons with some difficulty (15 years and above)[13] of a total population of 10.3 million[14]; in Samoa, about 2,910 persons with disability (15 years and above) of population of 118,200 (15 years and above)[15]; in Tuvalu, about 3.9% (430) people with disability who are 60 years and under of a 10,780 population Approximately 90% of Pacific Islanders live within five kilometres of the coast, placing them at the intersection of multiple slow- and rapid-onset hazards. As highlighted in the 2024 WMO report, the region's vulnerabilities are amplified by limited access to climate information, weak early warning coverage, and a lack of inclusive, people-centred preparedness systems. These gaps in drought forecasting, monitoring, and communication constrain timely and effective responses. This underscores the urgent need to enhance early warning services that are not only scientifically robust but

[11] https://globaldisabilityfund.org/situational_analysis/?wpv-document-category=country-situational-analysis&wpv_aux_current_post_id=1274&wpv_aux_parent_post_id=1274&wpv_view_count=1610&wpv-country=cook-is

[12] Kiribati National Statistics Office | Kiribati Statistics Census and Surveys

[13] https://www.disabilitydatainitiative.org/country-briefs/pg/

[14] https://data.who.int/countries/598

[15] https://sbs.gov.ws/images/sbs-documents/Population_and_Demography/Samoa_Disability_Monograph/Economic_Activity_Samoa_2018.pdf_final.pdf

		also inclusive, community-driven, and tailored to the diverse needs of Pacific Island people.
	b. Describe proposed partnerships and approach for stakeholder engagement in design and in implementation	**Project Design Process** This project builds on the CREWS PNG project, and lessons learnt from its implementation, particularly the successful twinning arrangement between PNG and the BoM was a foundation to the further project development. Building on the comprehensive design preparations undertaken during the CREWS SIEWAP project, which engaged regional and national stakeholders to develop people-centred early warning systems, the CREWS DREW Pacific project design phase similarly involved extensive consultations. During this phase, the project engaged closely with NDMOs and NMHSs from the selected seven countries to identify drought-specific vulnerabilities and local needs. Following these consultations, the project team coordinated discussions with regional institutions such as the BoM, SPREP, SPC, Earth Science NZ, and WMO to co-develop early warning tools and climate information products tailored to local contexts. UN agencies, including UNDP, UNDRR, and FAO, participated in this phase to provide guidance on aligning EWSs and actions design with broader development priorities such as food security and DRR. The project also coordinated with programmes such as the WRPP, COSPPac, and ClimSA to ensure complementarity and leverage existing knowledge and resources. During this period, while the EW4ALL consultation workshops were underway, WMO, as the focal point coordinating with the pillar leads in the Pacific (ITU, UNDRR and IFRC), used the opportunity to identify key national and regional priorities related to drought management and early warning systems during the discussions while the approved EW4ALL Country Roadmaps are forthcoming. **Project Implementation Arrangements** The Project will be implemented by WMO with a project manager and an associate project officer based in the WMO Representative Office for the South-West Pacific in Apia, Samoa. These two project officers will be in implementing the two CREWS Pacific projects ensuring synergy and information flow between the two projects. The implementing partners will enter into agreements with a consortium of national and regional partners to execute the project activities. The peer-to-peer approach that was utilized during the implementation of the CREWS Papua New Guinea project will continue in the CREWS DREW project, with BoM playing a key role in strengthening the capacities for drought early warning in the beneficiary NMHS. Further partners will include SPREP, SPC, Earth Science NZ, and selected NMHSs and NDMOs. A Project Steering Committee (PSC) will be established to oversee the project implementation, providing guidance and direction to

		WMO and Project Officers and partners. The PSC will review the project workplans and activities and M&E Plans. The PSC composition includes NMHS and NDMOs representatives from the seven Pacific SIDS as well as relevant partners as observers. The project will seek to co-finance and coordinate with WRPP and CREWS SIEWAP for the organization of the meetings. In terms of implementation, the project will work in close partnership with youth networks, faith-based organisations, National Red Cross Societies, and the IFRC to co-support and co-finance community awareness programs and small-scale resilience initiatives that promote local ownership and responsibility. These initiatives will be within existing national coordination mechanisms to ensure alignment with established disaster and climate risk management structures. For example, in Samoa, the Community Disaster and Climate Risk Management (CDCRM) mechanism, chaired by the NDMO, brings together the Fire and Emergency Services, the Red Cross, and other response agencies to deliver coordinated community-based preparedness and awareness activities. In the Cook Islands, the project will build on the successful work of the CISPac-5 project focusing on women's committees to expand outreach across the outer islands. From Niue, it will replicate the inclusive model piloted under CREWS 1 and 2, where Boys' and Girls' Brigade actively implemented community-based projects and awareness initiatives. Through these partnerships, implementation will continue to prioritize the engagement of women, youth, and persons with disabilities in outreach, training, and local monitoring activities to strengthen equitable participation and community resilience across all countries. In that light, during all trainings and workshops, the project will actively monitor and encourage invitations and participation that reflect this diversity, ensuring inclusive representation in every implementation activity.
Project design	a. Project components and activities, including describing what and how people centred, risk-informed, and gender sensitive approaches will be applied and how people most-at-risk, local actors and organizations will be engaged	The project structure follows the CREWS Monitoring, Evaluation and Learning Framework both at the Outcome and Output levels. Activities are further detailed in the annexed project results framework log frame. **Outcome 1: National and local multi-hazard early warning systems prioritized and funded.** *Output 1.1- A Country and/or region has developed or strengthened legislative and/or institutional frameworks to support and sustain MHEWSs.* – The project will develop and finalise national drought management and response plans, including SOPs and thresholds, for Cook Islands, Kiribati, PNG, Samoa, Tokelau, Vanuatu. It will update strategic plan and frameworks for climate services in the NMHSs of PNG, Samoa and Tokelau, integrating region-specific business continuity management guidelines tailored to Pacific SIDS.

		– Additionally, legislative support will be provided to strengthen drought-related institutional frameworks and other meteorological services, including drafting the PNG National Weather Service (NWS) Bill. *Output 1.2 – Multi-hazard needs, gaps and priority assessments, analyses, and related investment plans for EWSs in a country or region are driven by CREWS financing.* – The project will contribute to regional and national planning by developing a hydrological strategic plan for the Pacific in coordination with BoM, WRPP and CREWS SIEWAP, identifying key priorities for investment and coordination. It will generate State of the Climate reports for the seven participating Pacific Island countries, providing essential climate information to inform risk assessments and planning. Early warning products such as EAR Watch bulletins will be reviewed and improved, alongside the development of SOPs and delivery of capacity-building activities for NMHSs and stakeholders. Climate data rescue assessments will be undertaken in seven countries, with follow-up actions to preserve and digitise critical historical data. *Output 1.3. Partnerships and cooperation frameworks developed for financing and scaling up support to MHEWSs.* – The project will strengthen the achievement of the ambition of the EW4All initiative by supporting the implementation of priority actions from national MHEWS roadmaps in Kiribati, Samoa, and Vanuatu, with a focus on drought management. This includes an Integrated Disaster Management Information System for Samoa as a pilot. It will also contribute to regional coordination and advocacy by supporting the PMC and ministerial meetings, including logistical and travel support to ensure inclusive participation and engagement by all Pacific Island countries. **Outcome 2: Improved early warning service delivery and accessibility by national and regional institutions.** *Output 2.1 Risk information and tools generated by countries to enable the delivery of impact-based early warnings.* – The project will strengthen IBF and drought monitoring across the Pacific through the development and application of innovative tools and data products. In Tokelau, a Drought Tool will be implemented to support local water management and early warning. Advanced AI techniques will be integrated into PNG's national drought monitoring system, and new MSWEP products will enhance EAR Watch bulletins regionally. Impact-Based Forecast and Warning Services (IBFWS) will be expanded in PNG and introduced in the Cook Islands, focusing on

		drought and tropical cyclones. A regional IBFWS conference will also promote peer learning and exchange in partnership with CREWS SIEWAP. Finally, the project will support the development and communication of the State of the Climate report for the Southwest Pacific, enhancing regional climate awareness and the use of evidence-based risk information for publications and research through a writeshop with universities and scientific research institutions under the Pacific Climate Change Centre, providing an important peer-to-peer learning platform that strengthens regional collaboration and knowledge sharing among NMHSs and research partners that is sustained within the Pacific. *Output 2.2. Monitoring, analysis and forecasting of hazards that threaten the country/region are improved and sustained by the countries.* – The project will strengthen national and regional capabilities for drought hazard monitoring and prediction. It will support implementation of priority actions from Samoa's National Drought Management Policy including developing drought indicators and thresholds. WIS 2.0 will be assessed and implemented in Cook Islands, PNG, Tokelau and Tuvalu, with a focus on training and capacity development. In addition, a regional training workshop on WIS 2.0, WMO Hydrological Observation System (WHOS) and WIGOS will be conducted to enhance the quality, integration, and availability of observational data across Pacific NMHSs. This will be complemented by the procurement of calibration equipment and a dedicated hands-on calibration workshop to strengthen the accuracy, reliability, and long-term traceability of climate and hydrometeorological observations, ensuring consistent regional data standards and improved interoperability across national monitoring systems. Soil moisture and rainfall sensors will be procured and installed in selected countries to upgrade weather stations and support real-time data collection such as rainfall, soil moisture and salinity. In Papua New Guinea, the project will support HydroSOS implementation by introducing 3D-PAWS technology to print automatic weather stations, expanding the observation network and strengthening AI-enabled early warning and drought monitoring capabilities. Finally, the project will promote innovative and youth-led approaches that build on the HydroHuh and as the Global Integrated Flood and Drought Management (GIFDM) to enhance drought management systems, supporting long-term resilience and sustainability of EWSs in the Pacific.

		Output 2.3 Warnings are communicated by the countries based on common alerting protocols (CAP) under agreed standard operational procedures (SOPs). – The project will support the development of national communication frameworks in Kiribati, PNG and Tokelau to strengthen the dissemination of early warnings for drought and other hydrometeorological hazards. These frameworks will define roles, protocols, and communication channels to ensure timely and coordinated messaging. In PNG, the project will also deliver targeted communication and media training to improve the translation of technical forecasts into public-friendly messages. CAP will be implemented and operationalized in Cook Islands, PNG and Tuvalu, complemented by regional workshops to promote peer learning. Additionally, ICT and printing equipment will be provided to NMHS's in five countries to support the production and distribution of warning products and community engagement materials. *Output 2.4 Warnings are received, understood and acted upon based on co-produced preparedness and response plans by the countries.* – The project will enhance national and community capacity to act on early warnings and early actions through AA frameworks and tailored communication products. It will support pre-arranged financing mechanisms including parametric microinsurance and early action protocols for drought in Kiribati, PNG and Tuvalu, while developing climate and water-related information products for the relevant sectors including tourism, agriculture and water sectors in selected Pacific countries. PICOF and NCOF will be strengthened to improve climate risk communication and sector engagement. Community-based EWSs will be implemented across Cook Islands, Kiribati, Samoa, Tokelau and Tuvalu, integrating local water security measures and public awareness initiatives. Finally, targeted drought awareness materials will be developed and disseminated to enhance community understanding and preparedness across seven PICs. **Outcome 3 Early warning programmes are driven by people-centred and gender-responsive principles and promote private sector engagement.** *Output 3.1 People of different backgrounds, gender, youth, older persons, people with disability, poor, marginalized, displaced, and non-native, as well as related institutions have co-produced climate and weather information products tailored to their needs.* – The project will strengthen inclusive climate services to support drought prediction through a variety of targeted

		activities. It will support the participation of women in a regional Women in Leadership Workshop (WIL) to enhance gender-responsive leadership in CCA and DRM. A training framework and modules for hydrology technicians will be developed to build long-term technical capacity across participating countries. Youth engagement will be promoted through the design and dissemination of COPE series children's books in Kiribati, Samoa, and Vanuatu, as well as through a Climate Science Expo in the Cook Islands. In PNG, an assessment will be conducted to improve the accessibility of meteorological services for persons with disabilities. These efforts aim to ensure that climate and weather information is accessible, relevant, and co-produced with a wide range of users, contributing to more inclusive and effective EWSs. *Output 3.2 Private sector is engaged to foster innovation and sustainability in delivery of early warning services.* – The project will support engagement between public institutions and the private sector to strengthen the delivery and sustainability of early warning services. This will include targeted workshops or a regional conference with key sector being telecommunications with AI components. Planned discussions with the WMO Public-Private Engagement (PPE) Office to design and implement this activity in partnership with the CREWS SIEWAP project. The initiative aims to foster collaboration, identify opportunities for innovation, and leverage private sector capabilities in early warning dissemination and response.
	b. Work plan	**Attached as Annex 1- Workplan and Budget**

Organization and operating procedures	a. Institutional framework (Describe the planned project management set up and how all the organisations involved in implementing the project will work together. Give a brief description of each partner/actors key roles by component)	**<u>Governance Structure for the Project</u>** The governance structure for the CREWS DREW Pacific project is designed to ensure effective management, coordination, and oversight of the project's implementation, with clear roles and responsibilities for all stakeholders involved. This structure promotes a collaborative, inclusive approach, integrating national, regional, and international partners to deliver robust EWSs and early actions and DRM services in the Pacific region. – Project Steering Committee (PSC) - The PSC will provide strategic oversight, direction, and guidance to ensure that the project is implemented effectively and in alignment with the priorities and needs of the seven PICs' NMHSs and NDMOs. It will also be responsible for reviewing and confirming work plans, activities, and monitoring and evaluation (M&E) plans, ensuring that the project remains responsive to evolving needs.

		Composition - Representatives from all seven PICs including NMHSs and NDMOs (NDMOs participation is conditional on the availability of funds). They are the beneficiaries of the activities and are also executing specific activities on the national level. - WMO will serve as the secretariat to prepare all documents for the PSCs including technical reports, meeting minutes, and workplans. WMO is also responsible for producing the progress and financial reports for the CREWS Secretariat. Observers - Technical partners such as BoM, SPREP, SPC, UNDRR and Earth Science NZ. They execute specific technical activities with WMO through signed implementing agreements or letters of agreements and provide updates for the PSC meeting reports and workplans. Frequency of meetings – The PSC will be organized annually, however for urgent matters, virtual meetings can be organised. The PSC will be co-organized with other regional intiatives such as CREWS SIEWAP project, COSPACC, and WRPP to leverage participation, resources and awareness on activities planned for the region. If co-funding opportunities are not available, or limited, the PSC will be held virtually as an alternative option.
	b. Monitoring and evaluation system	The M&E system for the CREWS DREW Pacific project is designed in alignment with the CREWS MEAL Framework, and aims to ensure continuous tracking of project performance, identification of challenges or risks, and assessment of the effectiveness of the project's activities. The system will provide timely data to inform decision-making and enable the implementation of mitigation measures when necessary. Two evaluations will be conducted throughout the project's lifecycle: 1. **Mid-term Evaluation**: Led by WMO at the project's halfway point, this evaluation will review progress against the workplan and logical framework. It will assess the effectiveness of interventions in enhancing livelihoods and EWSs, particularly drought, and identify emerging challenges or risks. The evaluation will also offer recommendations for strategic or operational adjustments to ensure continued progress toward achieving the project's objectives. Findings and suggested changes will be presented to the PSC for consideration. The survey that is designed for the SIEWAP project will be used here as well.

		2. **Final Evaluation:** Conducted near the project's completion by an external consultant, the final evaluation will follow M&E standards agreed upon by WMO and CREWS as stipulated in the CREWS M&E Operational Procedures and be funded by the project. The Terms of Reference (ToR) and evaluation design will be jointly developed by WMO, with inputs from CREWS. This evaluation will assess overall project impact, including the sustainability of outcomes, and effectiveness in meeting objectives and overcoming implementation challenges. It will identify lessons learned—highlighting successes, challenges, and opportunities for improvement—and provide recommendations for future drought EWS programming in the Pacific region. Best practices and replicable strategies will also be documented for broader regional application.
Project viability and sustainability	a. Main identified risks	**Environmental risks (medium):** Hazards such as cyclones, floods, drought, and other extreme events have the potential to cause delays in project implementation, particularly for activities requiring travel to outer islands or communities. *Mitigation measures:* To manage this risk, the project will adopt a flexible approach allowing for the adjustment of the sequence of activities and work plans in response to environmental disruptions. Regular project reviews will ensure that any delays caused by environmental factors are identified and addressed and activities will be planned around the cyclone/rainy season. As the project mainly provides technical assistance no large civil works are anticipated and hence, will not generate any negative environmental impact. **Commitment from the countries (low to medium):** While overall commitment from participating countries remains high, the complex institutional structures and frequent changes in leadership within NMHSs, NDMOs, and ministries can delay approvals or slow implementation. In some contexts, overlapping mandates between agencies may also create coordination challenges. *Mitigation measures*: The Implementing Partner (WMO) will establish and maintain strong communication lines and coordination mechanisms with NMHSs and NDMOs and relevant ministries. **Human resources / capacity risks (medium):** The limited human and technical capacity of NMHSs and NDMOs to support project activities alongside their routine responsibilities remains a significant constraint. This includes high staff turnover, limited IT capacity and gaps in maintaining innovation tools. *Mitigation measure:* The project will align its activities with other regional projects/initiatives (CREWS SIEWAP, COSPPAC, ClimSA and WRP) to avoid duplication and overburdening NMHS staff.

		Targeted technical trainings, train the trainer methods (IBFWS and CAP), exchange programs or twinning will help address capacity gaps. Online courses/training modules will be produced to ensure refresher courses are accessible. **Financial capacity risks (medium):** Delays in financial reporting among implementing partners may affect disbursement timelines. Competing priorities within national agencies can also slow the utilisation of funds. *Mitigation measure:* WMO will arrange staggered disbursement via contractual arrangements linked to clear deliverables. Financial management guidance and templates will be shared with partners. Quarterly monitoring and reporting cycles will be enforced to ensure compliance and timely reporting. **Financial risk (medium):** The project may invest in hydrometeorological equipment's (hardware and software) that will not be maintained beyond the life of the project due to the limited financial resources in the responsible government agencies to sustain it. *Mitigation measure:* The project will address this by Obtaining commitment from NMHSs that they can maintain any software or hardware purchased via the Project to ensure its sustainability before procuring new software/hardware. **Financial risk (low)**: Fluctuations in exchange rates may affectthe value of disbursements made in local currencies, impacting project activities. *Mitigation measure:* Project partners will be advised to account for potential currency fluctuations in their budgeting and financial planning. **Political risk (low**): Political transitions, national elections or change in leadership priorities can affect institutional support for project activities or slow regulatory processes. *Mitigation measure:* WMO will identify and engage key stakeholders early in the project, including government officials and local communities when verifying planned activities. Regular communication through the PSC can help build awareness and address concerns that may arise and allow the project activities to continue with implementation. **Operational Risk (low to medium):** Low willingness of end-users to adopt new tools or practices and low private-sector participation may reduce project uptake and long-term sustainability. Mitigation: The project will emphasize participatory training approaches. Awareness and communication campaigns will be conducted in local languages and tailored for community audiences including people with disabilities, women and children.

		Engagement with the private sector will be encouraged through public-private partnerships.
	b. Critical assumptions	- The government institutions of the seven participating SIDS remain committed to the development and enhancement of drought management services, and the implementation of the project. - Governments are committed to mainstreaming hydrometeorological information and data into national policy, disaster risk management and planning. - Stakeholders and partners are willing to adopt new governance, institutional and regulatory mechanisms to ensure the integration of hydrometeorological data and information into disaster management and decision-making processes. - Key sectors are willing to utilize hydrometeorological information and data to improve resilience and reduce vulnerabilities to drought-related hazards - Governmental institutions, the private sector and civil society organizations will participate, cooperate and coordinate effectively in the design, implementation and scaling of EWS, with a focus on strengthening disaster preparedness and response to drought. - NMHSs will engage with end-users and ensure that their inputs are reflected in the design and delivery of drought early warning messages. - Communities and the public are willing to change behaviours and adopt climate-resilient livelihood strategies based on the information provided through EWS and hydrometeorological services. - Communities and the public can access and understand new hydrometeorological and disaster risk information ensuring they can act on early warnings and respond effectively to climate risks. - - Countries in the Pacific continue to strengthen regional cooperation, knowledge management and training on hydrometeorological and disaster risk management including sharing best practices, lessons learned and expertise to EWSs.
	c. Judgment on the project sustainability	<u>Judgement on environmental sustainability</u> WMO will count on Pacific-based project managers and officers, which will minimize negative environmental impacts related to travel. The project activities planned will not disrupt or cause environmental hazards in the selected Pacific SIDS. <u>Judgement on technological sustainability</u> A fraction of the project funds is expected to be invested in meteorological infrastructure during the implementation of this project. Efforts will be made by WMO to ensure and pass onwards ownership of the infrastructure to national and regional institutions. In addition, the project will provide support to the NMHSs that are selected to improve their services through

		enhancing the technologies utilized to distribute or capture data to ensure EW messages are delivered on a timely manner. The project activities specific to new technologies have been carefully discussed with national projects to co-support the sustainability after the life of the project. Judgement on social sustainability A key aspect of the project is its focus on gender, youth and disability-inclusive EWSs and early actions. Through tailored activities, the project will strengthen the capacity of marginalized groups to be better prepared to respond to drought-related hazards beyond the project timeframe. Likewise, special attention will be given to the inclusion and promotion of traditional knowledge in EWS, hopefully strengthening the capacity of national institutions to include traditional knowledge in their work. Judgement on institutional sustainability The project will strengthen the human and institutional capacity of NMHSs and NDMOs in the Pacific. Knowledge transfer will be ensured throughout the project implementation to strengthen the capacity of national authorities in producing and issuing early warning beyond the project timespan. The project is also fully aligned to the EW4ALL initiative, WRPP and SOFF, all of which are planned to be implemented beyond the four years of this project. Likewise, co-financing with the recently approved CREWS SIEWAP project will be key in ensuring the institutional sustainability of this project. The CREWS projects in the Pacific have been and will continue to be essential in building up the capacity of NMHSs and NDMOs staff in the region, alongside strengthening the institutional frameworks of Pacific SIDS to what it relates to EWS.

Attachment 1: Workplan and Budget

Attached separately

Attachment 2. Results Framework/Logical FrameworkAlignment to the CREWS MEAL framework

CREWS MEAL Outcomes	**Outcome 1. National and local multi- hazard early warning systems prioritized and funded**			**Outcome 2. Improved early warning service delivery and accessibility by national and regional institutions**				**Outcome 3. Early warning programmes are driven by people- centered and gender responsive principles and promote private sector engagement**	
	Output 1.1. A country	Output 1.2. Multi-	Output 1.3. Partnership	Output 2.1 Risk	Output 2.2.	Output 2.3	Output 2.4	Output 3.1 People of different	Output 3.2

CREWS MEAL Outputs Project Outputs		and/or region has developed or strengthened legislative and/or institutional frameworks to support and sustain multi-hazard early warning systems	hazard needs, gaps and priority assessments, analyses and related investment plans for early warning systems in a country or region are driven by CREWS financing	s and cooperation frameworks developed for financing and scaling up support to multi-hazard early warning systems	information and tools generated by countries to enable the delivery of impact-based early warnings	Monitoring, analysis and forecasting of hazards that threaten the country/region are improved and sustained by the countries	Warnings are communicated by the countries based on common alerting protocols under agreed standard operational procedures (SOPs)	Warnings are received, understood and acted upon based on co-produced preparedness and response plans by the countries	backgrounds, gender, youth, older persons, persons with disability, poor, marginalized, displaced, and non-native, as well as related institutions have co-produced climate and weather information products tailored to their needs	Private sector is engaged to foster innovation and sustainability in delivery of early warning services
	Output 1.1:	✓								
	Output 1.2:		✓							
	Output 1.3:			✓						
	Output 2.1:				✓					
	Output 2.2:					✓				
	Output 2.3:						✓			
	Output 2.4:							✓		
	Output 3.1								✓	
	Output 3.2									✓

Attachment 3: Monitoring and Evaluation Plan

4.1 Theory of Change

This section presents the Theory of Change for the CREWS DREW Project, inclusive of the key causal pathways, assumptions, and risks.

The DREW Project is structured around three key outcomes that collectively aim to strengthen drought resilience, enhance early warning capacities, and ensure people-centered, inclusive systems across Pacific SIDS.

Outcome 1: Funding and prioritizing national and local multi-hazard early warning systems

Governance and Institutional Frameworks:

If Pacific NMHSs and NDMOs strengthen their legislative, policy, and institutional arrangements for drought and multi-hazard early warning systems (MHEWS), they will be better equipped to sustain and deliver reliable early warning services. This includes the development and operationalization of national drought management plans, SOPs, and inter-agency coordination protocols to ensure timely decision-making and response. The approach assumes continued government commitment to integrating drought EWS into national priorities and allocating resources for its maintenance. The key risk is slow policy uptake or fragmented mandates that could hinder the institutionalization of new frameworks as well as any change in leadership that come with different vision and priorities.

To operationalize these frameworks, the project will support multi-hazard needs assessments, hydrological gap analyses, climate data-rescue activities, and State of the Climate reports to identify investment priorities and guide evidence-based planning and financing. It will also strengthen

partnership and cooperation mechanisms by aligning with EW4All, the Pacific Meteorological Council (PMC), and regional partners such as SPREP, SPC, and IFRC to mobilize technical collaboration and co-financing for sustained MHEWS development. The main risk is limited partner alignment or coordination gaps, which could reduce the efficiency of resource mobilization and scaling.

Outcome 2: Improved Early Warning Service Delivery and Accessibility by National and Regional Institutions

Enhanced Risk Information and Forecasting Tools

If Pacific NMHSs strengthen drought monitoring, forecasting, and impact-based warning service/capabilities through advanced tools such as EAR Watch, HydroSOS, MSWEP datasets, AI-driven systems, and Impact-Based Forecasting and Warning Services (IBFWS), they will be able to deliver timely and actionable information that supports anticipatory action and disaster risk reduction.

The project will operationalize these tools through targeted activities such as implementing a Drought Tool for Tokelau, expanding AI integration in PNG drought monitoring system, and producing MSWEP-based drought maps to improve regional Rainfall Watch bulletins. These outcomes assume sufficient technical capacity and data connectivity within NMHSs; however, limited IT capacity and inconsistent data-sharing arrangements remain key risks for interoperability.

Strengthened Observation and monitoring

To improve forecasting accuracy, the project will expand and modernise observation networks, including the enhancement of automatic weather stations (AWS) with soil-moisture sensors, the adoption of WIS 2.0 and WIGOS standards, and regional calibration training and equipment procurement to ensure consistent data quality.

In Papua New Guinea, support will focus on implementing HydroSOS and the WMO Hydrological Observing System (WHOS), complemented by the introduction of 3D-PAWS technology to improve monitoring efforts. Together, these measures will enhance real-time hydrological monitoring and AI-empowered early warning capabilities. The approach assumes ongoing national maintenance and calibration capacity through the Weather Ready Pacific Program; the main risk is limited operational budgets for sustaining new systems.

Improved Communication and Community Preparedness

The project will enhance last-mile connectivity by operationalizing Common Alerting Protocol (CAP) systems and developing national communication frameworks for drought and hydrometeorological hazards, accompanied by media and ICT capacity-building workshops. At the community level, it will implement Community-Based Early Warning Systems (CbEWS), Anticipatory Action frameworks, and water-security measures in Kiribati, Samoa, Tokelau, Tuvalu, and PNG. These initiatives will promote proactive preparedness and strengthen the link between forecast information and local decision-making. The approach assumes strong coordination with local governance and civil-society networks, while the main risk is the geographic isolation and connectivity challenges of outer islands, which may limit timely information flow and response coordination.

Outcome 3: People-Centered and Gender-Responsive Early Warning Programmes

Inclusive and Participatory Approaches

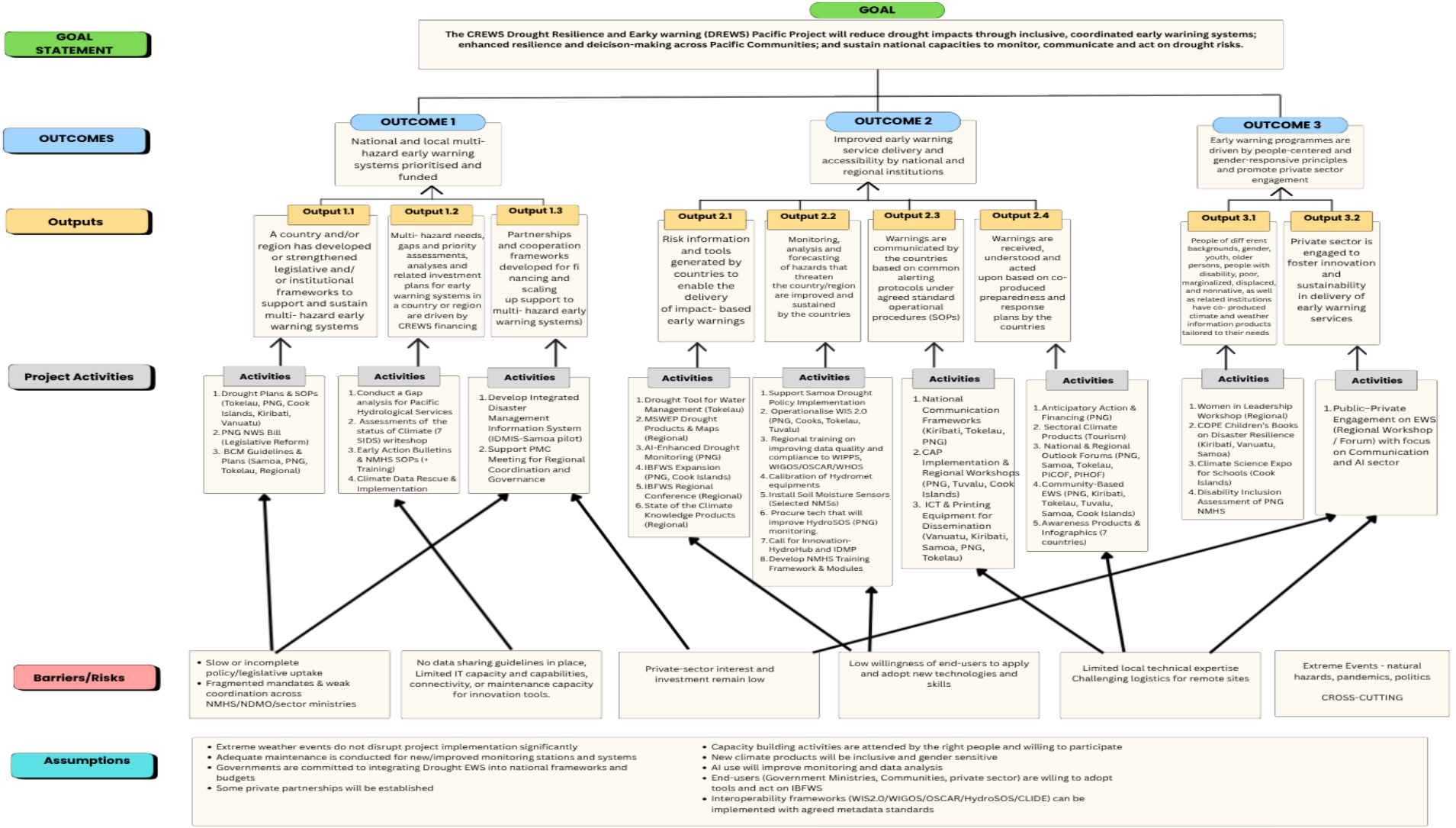
The project will promote the production of weather and climate information with women, youth, and persons with disabilities in communities to ensure early warning systems are inclusive and community driven. It will build on mechanisms such as Samoa's CDCRM, partnering with faith-based groups, youth networks, and National Red Cross Societies (with IFRC) to strengthen outreach and ownership. In the Cook Islands, it will expand the CISPac-5 Women's Committee model. Activities such as Women in Leadership workshops, the COPE Children's Series, and Climate Science Expos will further enhance awareness and leadership, while an accessibility assessment in PNG NMHS will promote disability-inclusive services. The approach builds on Community-Based Early Warning Systems (CbEWS) and

Traditional Knowledge under COSPPac and CREWS Pacific 1-2, with the main risk being limited resources to sustain inclusion initiatives beyond the project period.

Innovation and Private-Sector Engagement

Partnerships with ITU, GSMA, UNDRR, SPREP-WRP and IFRC will foster AI- and communication-based innovations to enhance last-mile early warning delivery and strengthen public-private collaboration under WRP and EW4ALL. This approach assumes sustained commitment and mutual interest from both private partners and national institutions. The primary risk is data-sharing and ownership, particularly ensuring that private-sector technologies comply with national data governance frameworks and maintain interoperability with public systems.

Therefore, the CREWS DREW Project establishes a pathway to strengthen drought resilience and multi-hazard early warning systems across Pacific SIDS. By combining institutional strengthening, enhanced forecasting and monitoring capabilities, inclusive community engagement, and innovation partnerships, the project directly contributes to the EW4ALL initiative and WRP. Together, these efforts will enable Pacific NMHSs and partners to deliver timely, accurate and inclusive early warnings that protect lives, livelihoods, and critical infrastructure while building long-term national and regional resilience to climate extremes.


GOAL
GOAL STATEMENT
The CREWS Drought Resilience and Earky warning (DREWS) Pacific Project will reduce drought impacts through inclusive, coordinated early warining systems; enhanced resilience and deicison-making across Pacific Communities; and sustain national capacities to monitor, communicate and act on drought risks.
OUTCOMES
OUTCOME 1
National and local multi-hazard early warning systems prioritised and funded
OUTCOME 2
Improved early warning service delivery and accessibility by national and regional institutions
OUTCOME 3
Early warning programmes are driven by people-centered and gender-responsive principles and promote private sector engagement
Outputs
Output 1.1
A country and/or region has developed or strengthened legislative and/ or institutional frameworks to support and sustain multi- hazard early warning systems
Output 1.2
Multi- hazard needs, gaps and priority assessments, analyses and related investment plans for early warning systems in a country or region are driven by CREWS financing
Output 1.3
Partnerships and cooperation frameworks developed for fi nancing and scaling up support to multi- hazard early warning systems)
Output 2.1
Risk information and tools generated by countries to enable the delivery of impact- based early warnings
Output 2.2
Monitoring, analysis and forecasting of hazards that threaten the country/region are improved and sustained by the countries
Output 2.3
Warnings are communicated by the countries based on common alerting protocols under agreed standard operational procedures (SOPs)
Output 2.4
Warnings are received, understood and acted upon based on co-produced preparedness and response plans by the countries
Output 3.1
People of diff erent backgrounds, gender, youth, older persons, people with disability, poor, marginalized, displaced, and nonnative, as well as related institutions have co- produced climate and weather information products tailored to their needs
Output 3.2
Private sector is engaged to foster innovation and sustainability in delivery of early warning services
Project Activities
Activities
1. Drought Plans & SOPs (Tokelau, PNG, Cook Islands, Kiribati, Vanuatu)
2. PNG NWS Bill (Legislative Reform)
3. BCM Guidelines & Plans (Samoa, PNG, Tokelau, Regional)
Activities
1. Conduct a Gap analysis for Pacific Hydrological Services
2. Assessments of the status of Climate (7 SIDS) writeshop
3. Early Action Bulletins & NMHS SOPs (+ Training)
4. Climate Data Rescue & Implementation
Activities
1. Develop Integrated Disaster Management Information System (IDMIS-Samoa pilot)
2. Support PMC Meeting for Regional Coordination and Governance
Activities
1. Drought Tool for Water Management (Tokelau)
2. MSWEP Drought Products & Maps (Regional)
3. AI-Enhanced Drought Monitoring (PNG)
4. IBFWS Expansion (PNG, Cook Islands)
5. IBFWS Regional Conference (Regional)
6. State of the Climate Knowledge Products (Regional)
Activities
1. Support Samoa Drought Policy Implementation
2. Operationalise WIS 2.0 (PNG, Cooks, Tokelau, Tuvalu)
3. Regional training on improving data quality and compliance to WIPPS, WIGOS/OSCAR/WHOS
4. Calibration of Hydromet equipments
5. Install Soil Moisture Sensors (Selected NMSs)
6. Procure tech that will improve HydroSOS (PNG) monitoring.
7. Call for Innovation- HydroHub and IDMP
8. Develop NMHS Training Framework & Modules
Activities
1. National Communication Frameworks (Kiribati, Tokelau, PNG)
2. CAP Implementation & Regional Workshops (PNG, Tuvalu, Cook Islands)
3. ICT & Printing Equipment for Dissemination (Vanuatu, Kiribati, Samoa, PNG, Tokelau)
Activities
1. Anticipatory Action & Financing (PNG)
2. Sectoral Climate Products (Tourism)
3. National & Regional Outlook Forums (PNG, Samoa, Tokelau, PICOF, PIHOF)
4. Community-Based EWS (PNG, Kiribati, Tokelau, Tuvalu, Samoa, Cook Islands)
5. Awareness Products & Infographics (7 countries)
Activities
1. Women in Leadership Workshop (Regional)
2. COPE Children's Books on Disaster Resilience (Kiribati, Vanuatu, Samoa)
3. Climate Science Expo for Schools (Cook Islands)
4. Disability Inclusion Assessment of PNG NMHS
Activities
1. Public–Private Engagement on EWS (Regional Workshop / Forum) with focus on Communication and AI sector
Barriers/Risks
• Slow or incomplete policy/legislative uptake
• Fragmented mandates & weak coordination across NMHS/NDMO/sector ministries
No data sharing guidelines in place, Limited IT capacity and capabilities, connectivity, or maintenance capacity for innovation tools.
Private-sector interest and investment remain low
Low willingness of end-users to apply and adopt new technologies and skills
Limited local technical expertise Challenging logistics for remote sites
Extreme Events - natural hazards, pandemics, politics
CROSS-CUTTING
Assumptions
• Extreme weather events do not disrupt project implementation significantly
• Adequate maintenance is conducted for new/improved monitoring stations and systems
• Governments are committed to integrating Drought EWS into national frameworks and budgets
• Some private partnerships will be established
• Capacity building activities are attended by the right people and willing to participate
• New climate products will be inclusive and gender sensitive
• AI use will improve monitoring and data analysis
• End-users (Government Ministries, Communities, private sector) are willing to adopt tools and act on IBFWS
• Interoperability frameworks (WIS2.0/WIGOS/OSCAR/HydroSOS/CLIDE) can be implemented with agreed metadata standards

4.2 Monitoring

This section describes how the project will monitor performance and track progress toward planned results in the results framework.

- **Roles and responsibilities for monitoring activities**

Responsible	Tasks
Project Officers WMO	• Oversee the overall monitoring and evaluation (M&E) process. • Ensure alignment of monitoring activities with the project's goals and objectives. • Monitor project activities, including assessing progress toward deliverables. • Review and approve monitoring plans and performance reports. • Carry out internal mid-term evaluation to assess project progress.
External Evaluator	• Conduct independent end-of-project assessments or evaluations to validate internal monitoring results. • Provide recommendations based on findings to enhance future project performance. • Assess whether the project outcomes and impacts are in line with the goals and objectives.
Project Steering Committee	• Review monitoring reports to provide strategic guidance. • Hold the project accountable for achieving its stated objectives.

A baseline data report which is a tool that presents the initial magnitudes of indicators, i.e. their value at the start of an intervention:

1. Introduction	*Briefly explain the purpose of the report and relevant information about the process of collecting the baseline data (period of collection, mention of methods used, locations where data was collected, total number of indicators in the report, team or individual who undertook the collection, and other elements that the manager finds important).* The consultation Report underpins the **Drought Resilience and Early Warning Pacific (DREW Pacific) Project**, aligning closely with the priorities set by Pacific Small Island Developing States (SIDS) at both national and regional levels. It captures the starting point for the capacities of National Meteorological and Hydrological Services (NMHSs), National Disaster Management Offices (NDMOs), and Early Warning Systems and Early Action (EWSEA), serving as a benchmark to track the project's progress and effectiveness over time. Data collection for this baseline was carried out through an inclusive and participatory approach, led by the **World Meteorological Organization (WMO)** Representative Office for South-West Pacific Office throughout the 2024-2025 period. The key activities involved: • **In-person Needs and Gaps Assessments:** Engaged with NMHSs, NDMOs, and Red Cross/Red Crescent Societies to pinpoint shortcomings in climate services and drought-related early warning capacities during regional meetings and workshops. • **EW4ALL National and Regional Consultations:** Conducted targeted consultations and developed draft roadmaps with countries including Samoa, Vanuatu, and Kiribati to set priorities for enhancing early warning systems and ensuring inclusivity. • **Stakeholder Engagements (both in-person and virtual):** Validated project priorities through direct discussions with NMHSs, NDMOs, and

	community representatives across the seven Pacific islands, emphasizing the involvement of vulnerable groups such as women's organizations and disability forums. The regional intergovernmental organizations such as SPREP and SPC and partners were also consulted to streamline and coordinate efforts to complement ongoing and planned initiatives. • **Coordination with Technical Partners:** Facilitated collaboration with regional and international entities like SPREP, SPC, BOM, NIWA, PDF were conducted and Indonesia's BMKG discussions were also conducted during this period as well. • **Comprehensive Desktop Review:** Assessed existing projects and donor initiatives related to drought early warning and climate resilience to identify achievements and outstanding gaps, focusing especially on areas not covered by other partners/programmes aside from CREWS. This collaborative and multi-stakeholder process ensures that the baseline data accurately represents the challenges, capacities, and priorities of the region's key actors. The information gathered provides a solid foundation to measure the project's impact and supports informed decision-making for enhancing drought resilience across the Pacific SIDS.
2. Summary of intervention (program, project or investment)	*Briefly describe the intervention in question, including objective, approach, main components, partners, start-up, duration and any other elements considered relevant.* The CREWS DREW Pacific project is a regional initiative aimed at enhancing drought preparedness and resilience across Pacific Small Island Developing States (SIDS), including Cook Islands, Kiribati, Papua New Guinea, Samoa, Tokelau, Tuvalu, and Vanuatu. Spanning four years from 2025 to 2029, and funded with by CREWS, the project is led and implemented by the World Meteorological Organization (WMO). *Objective* The primary goal of the project is to strengthen integrated, community-focused early warning systems and early actions (EWSEA) for drought, improving decision-making and reducing the socio-economic impacts of drought events. This objective addresses the urgent need for enhanced climate resilience in Pacific Island nations vulnerable to climate variability and extreme drought conditions. *Approach* The project adopts a participatory and multi-sectoral approach that engages key stakeholders at national, regional, and community levels. It focuses on building the technical capacity of NMHSs and NDMOs, while integrating local communities' needs, including those of marginalized groups such as persons with disabilities, youth, and women. The approach also emphasizes strengthening institutional coordination and enhancing data sharing and drought monitoring tools. The project activities are designed to build on the successes of the first CREWS PNG with a focus on enabling and strengthening the PNG-NWS on improving their forecasting capabilities and tools to validate and produce national alerts. *Main Components* – Capacity building for NMHSs and NDMOs in drought monitoring and early warning dissemination. – Development and implementation of integrated and community-focused EWSEA tailored to drought risks and community needs. – Inclusive stakeholder engagement, ensuring vulnerable groups are incorporated into preparedness and response strategies.

	– Strengthening partnerships between national governments, regional organizations, NGOs, and international agencies to enhance drought risk management. – Community training and awareness programs to improve local adaptive capacity and response effectiveness. *Partners* The project collaborates with a range of partners to maximize impact, including: – NMHSs of the seven participating countries. – Regional Specialized Meteorological Center (RSMC) Nadi. – NDMOs. – Relevant line ministries (health, water, agriculture, tourism, infrastructure). – Non-governmental organizations and community groups. – Regional bodies such as the SPREP, SPC, NIWA, BoM and BMKG. – Pacific Disability Forum (PDF) to ensure social inclusiveness. UN Agencies such as UNDRR, FAO and UNEP. *Start-Up and Duration* The project is scheduled to commence in Q1 2026 and run through to Q4 2029, allowing for its implementation to be aligned with the CREWS SIEWAP Project. Initial activities will focus on needs assessments, stakeholder engagement, and establishing monitoring baselines, followed by progressive capacity building and infrastructural upgrades.
3. Baseline values for the indicators	*Include the following information for each indicator:* – Indicator name and code – Type of indicator – Output or result measured by the indicator – The immediate and/or intermediate outcomes (as appropriate) into which the immediate output or outcome fits (the results chain). – Baseline data, including baseline data broken down by corresponding categories if applicable. – Target, including annual targets and end-of-project targets, including targets broken down by corresponding categories if applicable. **The baseline values and indicators are attached separately (Excel Workbook file under Logframe tab)**

4.3 Evaluation

This section describes all anticipated evaluations from performance to impact, relevant to the project, and can be used to track evaluations over the project's timeframe. It can include:

- **An evaluation plan, which identifies the different types of internal and external evaluations to be carried out over the implementation period. It also includes the timetable for carrying out the evaluations, as well as the budget, i.e. the human and financial resources required.**

Evaluation type	Evaluation management		When it will be performed				Resources	Budget
	Internal	External	Yr 1	Yr 2	Yr 3	Yr 4		
Formative evaluation (mid-term or process evaluation)	X			X			Internal resources WMO	N/A

Final evaluation		X				X	External Consultant / Independent Evaluator	USD 50,000
Impact evaluation		X				X		

4.4 Learning

The learning section identifies how the project will use available information to learn and adaptively manage implementation. It can include:

- **A learning plan which describes the learning activities to be carried out over a given period (annual, biannual, etc.), specifying objectives and expected results, participants and timetable.**

Type of activity	Objective/ expected results	Methodology/ material needed	Target audience/participants	Execution calendar
Business Continuity Management (BCM) training workshop regional and in country (Samoa).	The BCM is to prepare, and provide and maintain controls and capabilities, for managing an organisation's overall ability to continue to operate during disruptions.	The methodology and materials will be defined by WMO.	NMHSs and NDMOs staff from the selected 7 SIDS.	
Early Action Rainfall (EAR) training workshop.	It will support the development of SOPs for NMHSs and deliver both new content and refresher training for NMHSs staff and key stakeholders.	Materials and methodologies from BoM will be used for the implementation of this capacity building activity.	NMHSs staff from the 7 selected Pacific SIDS.	
Training on a drought management tool in Tokelau.	The tool will support improved management of household and community water tanks, enhance early warning systems, and inform decision-making during drought events.	The methodology and materials will be developed by NIWA in partnership with PARTNer-2 Programme.	Tokelau NMHS and NDMO staff.	
Workshop training for PNG on drought management system.	The training is how to use and maintain the AI-enhanced system effectively.	The discussion is ongoing with BMKG/RIMES to deliver an improved system with AI integrated.	PNG NHMSs staff.	
Conduct IBFWS training for Cook Islands and PNG.	Trainings of NMHSs staff from Cook Islands and PNG will be implemented in order to support countries NMHSs in advancing and enhancing their IBFWS-capacities.	The methodology and materials will be developed by WMO experts with the support from external	Selected staff from the NMHS of Cook Islands and PNG.	

Type of activity	Objective/ expected results	Methodology/ material needed	Target audience/participants	Execution calendar
		consultants with expertise on IBFWS.		
Assess, implement and operationalize WIS 2.0 in Cook Islands, PNG, Tokelau and Tuvalu.	Training of NMHSs staff from Cook Islands, PNG, Tokelau and Tuvalu on the utilization and technicalities of WIS 2.0.	The methodologies and materials will be developed by WMO experts and tailored to each country's needs.	Selected staff from the NMHSs of Cook Islands, PNG, Tokelau and Tuvalu.	
Joint writeshop and regional dialogue on drought and related publications.	Support regional knowledge products.	The initiative will enhance regional understanding, ownership, and application of climate and drought knowledge through inclusive and locally grounded science communication.	Regional activity with SPREP-PCCC, supported by partners including IPCC project contributors, ANU, CSIRO, DFAT, and MFAT.	
Assess, implement and operationalize CAP in Cook Islands, PNG and Tuvalu and facilitate peer learning amongst Pacific SIDS on CAP.	Training on CAP operationalization at the national level in Cook Islands, PNG and Tuvalu following the regional CAP training delivered under the CREWS Pacific SIDS 2.0 project.	The materials and methodologies for the tailored national trainings will be developed and delivered by WMO experts.	Selected NMHSs staff from Cook Islands, PNG and Tuvalu.	
WIGOS, OSCAR/SURFACE, WDQMS subregional training for Pacific SIDS.	Build on first RA V training under CREWS Pacific SIDS 2.0 project to expand the training Pacific SIDS under the CREWS DREW Pacific project and support the Regional WIGOS Center (RWC).	The methodology and materials will be defined by WMO.	Selected NMHSs and NDMOs staff	
Regional training on traceability assurance and measurement uncertainty	This training will support the broader goals of the drought project by strengthening the accuracy and reliability of climate and	The methodology and materials for the trainings will be developed by	Selected NMHS staff from the Pacific region.	

Type of activity	Objective/ expected results	Methodology/ material needed	Target audience/participants	Execution calendar
	hydrometeorological observations.	WMO and partners.		
Hydrometeorological instrument calibration training for NMHSs.	To ensure proper integration and use of the sensors for improved drought and climate monitoring.	The methodology and materials for the trainings will be developed by WMO and NIWA.	Selected NMHS staff from the Pacific region.	
Women in Leadership.	A third women in leadership workshop its main objective is creating nourishing space for female professionals working in the fields of meteorology, hydrology, DRR/DRM and related disciplines, to be empowered, share experiences and learn leadership skills.	The methodology and materials are developed by an external gender expert, who tailors the material and methodology of the workshop to the context of the Pacific region	Selected female staff from NMHS, NDMOs and regional organizations from the Pacific region.	Q3-2027
Hydrological Observing System (WHOS) regional workshop,	To conduct a regional workshop to train members on interoperable data exchange for hydrology, covering metadata management, data standardization, exchange protocols, access, and availability	The methodology and materials for the trainings will be developed by WMO and	Selected NMHSs staff from the Pacific region.	
Communication and media trainings	Communication and media training will be delivered to improve the capacity of relevant stakeholders in translating technical forecasts into public messages that support preparedness and early action, especially in the context of slow-onset hazards such as drought.	The methodology and materials for the trainings will be developed by WMO and relevant partners.	Selected staff from PNG NMHS and NDMO.	
AA training for Kiribati, PNG and Tuvalu.	Support the development of AA or early action (EA) protocols and frameworks in Kiribati and Tuvalu and pre-arranged financing for PNG.	The methodology and materials for the trainings will be developed by UNDRR and	NMHSs and relevant partners in Kiribati, PNG and Tuvalu.	

Type of activity	Objective/ expected results	Methodology/ material needed	Target audience/participants	Execution calendar
		relevant partners.		
CBbEWS in Rarotonga in Partnership with the Women's Committee.	This will support the establishment of a CBEWS for drought and other climate risks in Rarotonga, implemented in partnership with the local Women's Committee.	The methodology and materials will be national Komiti AuVaine.	National Women Committee in Rarotonga Cook Islands.	
Develop a training framework/strategy and modules for hydrology technicians	Develop the training modules in coordination with WMO Learning and Development Office for hydrology technicians.	The methodology and materials will be developed by WMO and NIWA.	Selected NHSs from the 7 countries	

Annex 4: References

List of Acronyms

- ACP – African, Caribbean and Pacific
- **AI** – Artificial Intelligence
- ANU – Australian National University
- **BoM** – Bureau of Meteorology
- CCA – Climate Change Adaptation
- **CAP** – Common Alerting Protocol
- CBOs – Community Based Organizations
- **CREWS** – Climate Risk and Early Warning Systems
- CSOs – Civil Society Organizations
- CSIRO – Common Weather Scientific and Industrial Research Organization
- **DREW** – Drought Resilience and Early Warning PacificProject)
- DFAT – Department of Foreign Affairs and Trade
- EU – European Union
- **EWS** – Early Warning Systems
- EWSA – Early Warning System and Actions
- **EW4ALL** – Early Warnings for All
- **FAO** – Food and Agriculture Organization
- GB – Great Britain
- GBON – Global Basic Observation Network
- **HydroSOS** – Global Hydrological Status and Outlook System
- **IBFWS** – Impact-Based Forecast and Warning Services
- **ICT** – Information and Communication Technology
- IPCC – Intergovernmental Panel on Climate Change
- KMS – Kiribati Meteorological Service
- **MEAL** – Monitoring, Evaluation, Accountability, and Learning
- MFAT – Ministry of Foreign Affairs and Trade
- **MHEWS** – Multi-Hazard Early Warning Systems
- **M&E** – Monitoring and Evaluation
- **MSWEP** – Multi-Source Weighted Ensemble Precipitation
- NCOF – National Climate Outlook Forum
- NDC – National Determine Contribution

- **NDMA** – National Disaster Management Authority
- **NDMO** – National Disaster Management Office
- **NMHS** – National Meteorological and Hydrological Services
- **NIWA** – National Institute of Water and Atmospheric Research
- NWS – National Weather Service
- OSCAR – Observing Systems Capability Analysis and Review Tool
- PCCC – Pacific Climate Change Center
- PIHOF – Pacific Hydrological Outlook Forum
- PICs – Pacific Island Countries
- PICAP – Pacific Insurance Climate Adaptation Program
- PMC – Pacific Meteorological Council
- **PNG** – Papua New Guinea
- PPE – Public Private Engagement
- **PSC** – Project Steering Committee
- RIMES – Regional Integrated Multi-Hazards Early Warning System for Africa and Asia
- RWC – Regional WIGOS Center
- SAP – Simplified Access Process
- **SIDS** – Small Island Developing States
- **SOC** – State of the Climate
- **SOFF** – Systematic Observations Financing Facility
- **SPC** – Pacific Community
- **SPREP** – Secretariat of the Pacific Regional Environment Programme
- **SOP** – Standard Operating Procedure
- SWCEM – Space-based Weather and Climate Extreme Monitoring
- **TOR** – Terms of Reference
- TWC – Technical Working Group
- UNDP – United Nations Development Programme
- UNEP – United Nations Environment Programme
- WB – World Bank
- WDQMS – WIGOS Data Quality Management System
- **WIGOS** – WMO Integrated Global Observing System
- **WHOS** – WMO Hydrological Observing System
- **WIS** – WMO Information System
- **WRP** – Weather Ready Pacific
- **WMO** – World Meteorological Organization

Annex 5: Consultation Report – attached separately

Reference Materials

- Australian Department of Foreign Affairs and Trade (DFAT). (2024). *Pacific Multi-Hazard Early Warning Systems (MHEWS) Stocktaking Report*.
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- Worldometers. (2025). *Pacific Island population statistics*. https://www.worldometers.info

Comment Matrix (synthesis of comments received from Experts nominated by CREWS Steering Committee Members)