

EIGHTH MEETING OF THE PACIFIC METEOROLOGICAL COUNCIL

PMC-8

Nuku'alofa, Tonga • 10, 11, 14 September 2026

Eighth Meeting of the Pacific Meteorological Council (PMC-8)

Weather Ready for a Secured and Sustainable Pacific

10, 11, 14 September 2026 | Nuku'alofa, Tonga

Agenda Item 17.2: Progress of EW4All – Global

Purpose:

1. To provide updated information on the progress with implementing the Early Warnings for All (EW4All) initiative

Objectives:

1. To provide information on the global governance and implementation structure of EW4All and future directions (post 2027).
2. To discuss the status of EW4All in WMO Regional Association V (South-West Pacific) (RA V)

Background:

Global Progress and future Directions

1. Since its launch in 2022, EW4All has generated strong political momentum and accelerated action towards protecting everyone through multi-hazard early warning systems (MHEWSs). Yet important gaps remain, and sustaining progress beyond 2027 will require continued commitment, stronger institutions, sustainable financing, and maintaining and strengthening partnerships. As EW4All approaches its 2027 milestone, attention is turning to the future of global co-operation on early warning systems. The nature of the challenge is also changing. The priority is not only to continue to expand coverage, but to ensure that systems are operational, connected end-to-end, financially sustainable, and capable of triggering action to reduce loss and damage to livelihoods, assets, public services, and critical infrastructure.
2. How this effort continues beyond 2027 is a matter of active discussion. A regional consultation process is underway, beginning with a forum in Addis Ababa, Ethiopia, from 2-4 September 2027. The Weather Ready Pacific (WR) Programme's Liaison Platform, PMC, and PMMM also provide important opportunities for feedback.
3. As of July 2026, 136 countries reported having an MHEWS through the Sendai Framework Monitor (SFM) Target G, 27 more than at the launch of EW4All and 80 more than when national reporting began in 2015. Average comprehensiveness scores have increased by nearly 50 per cent over the same period. These figures demonstrate progress, but not universal protection. The existence of an MHEWS alone does not necessarily mean that the system is operational

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across all hazards and territories, reaches all people at risk, or triggers timely action. Nevertheless, considerable work has been done, including the expansion and improvement of systems and services, and also in raising the bar of expected warning service standards, including through recent updates to WMO's Technical Regulations and in the publication of guidance and best practices.

4. The future priority is not only to expand coverage, but to ensure that systems are operational, connected end-to-end, financially sustainable, and capable of triggering action to reduce loss and damage to livelihoods, assets, public services, and critical infrastructure.
5. Four issues stand out:

a. Uneven global progress

Significant protection gaps persist in fragile and conflict-affected settings, many Small Island Developing States (SIDSs) and Least Developed Countries (LDCs), and a less visible group of highly hazard-prone middle-income countries.

The protection gap exists both between and within countries. In some countries, the primary challenge is to establish basic capabilities. In others, systems exist but are fragmented, unevenly developed, or insufficiently connected from risk knowledge to action.

b. Operational performance gaps

The process of translating risk information into impact-based forecasts that better inform people about how to take protective actions, reaching all populations with actionable warnings, and linking warnings to preparedness and decision-making can be complex.

For observations and forecasting, impact-based forecasting and hazard monitoring remain areas with scope for improvement. In regard to hydrometeorological observations, although observation gaps are narrowing, only around one tenth of countries are currently compliant with the Global Basic Observing Network (GBON). Gaps in observations constrain forecast quality downstream and can be particularly significant for countries that depend on limited national networks. Resource constraints compound these technical gaps. Nearly one third of National Meteorological and Hydrological Services (NMHSs) report no funding for infrastructure or service upgrades.

The warning dissemination assessments identify a similar difference between basic and more advanced capability. Many countries use channels such as SMS, social media, radio, television, and sirens, while more targeted and automated systems remain less developed. While close to 40 countries have implemented or are implementing cell broadcast systems since 2022, the system is not yet operational in most countries of the world. Use of the Common Alerting Protocol (CAP) throughout the warning chain also remains limited, as do automated protective systems for rapid-onset hazards.

These are not isolated technical gaps. Operational challenges at one point in the chain constrain performance across the wider system. In many or most cases, the technical solutions

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are available, but the financial arrangements around implementing and sustaining solutions have not been found.

The evidence also points to a distinction between technical coverage and effective reach. A warning can be generated and transmitted without being understood, trusted, accessible, or actionable. Last-mile effectiveness depends not only on communications infrastructure but on accessible formats, trusted institutions, appropriate language, redundancy, local networks, and community preparedness.

This distinction will become increasingly important as overall coverage improves. Counting countries with systems will provide a progressively less complete picture unless monitoring can also show who is reached and able to act.

c. Hazard gaps requiring attention

Progress on MHEWS has been concentrated primarily around hydrometeorological hazards, reflecting both their frequency and the accelerating impacts of climate change. At the same time, several major and growing risk categories remain insufficiently integrated into national and international early warning systems, governance arrangements, and financing frameworks.

The 2022 Hunga Tonga–Hunga Ha'apai eruption in Tonga illustrated these gaps starkly. Eruptions from a largely unmonitored volcano severed national communications, triggered a Pacific-wide tsunami, and caused extensive ashfall and underwater infrastructure damage. The experiences from Tonga, both positive and negative, should inform our global thinking on potentially catastrophic events requiring globally supported MHEWS. In addition to volcanic hazards and other geohazards, wildfires, extreme heat, and solar storms have all been the subject of recent discussion. An analysis of thirty-five country roadmaps developed under EW4All has shown that many countries are beginning to prioritise some of these non-hydrometeorological hazards.

d. Misalignment of financial models with national systems

Available data show that financing is highly concentrated, dominated by loans and credits, and often focused on infrastructure and initial capacity development rather than the recurrent costs required to sustain the operation and maintenance of critical public early warning services. It is crucial to ensure that adequate finance is available before impacts occur.

Early warning should therefore be understood not only as a technical or humanitarian function, but as essential economic and resilience infrastructure. Effective systems protect public and private investment, critical infrastructure, social services, fiscal stability, and development gains.

6. New Early Warning Services Technical Regulations and Key Recent Publications

From the WMO perspective, a major achievement with ramifications across the 4 pillars has been the agreement and publication of updated technical regulations for early warning services, which substantially expand Member commitments towards providing quality multi-hazard, impact-based and user-focused early warning services. The regulations specify the mandatory ('shall') and recommended ('should') practices and cover matters including:

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- Definition of institutional arrangements
- Coordination between entities
- Quality and business continuity of services received by public
- Information about possible impacts of hazards on communities, infrastructure and relevant socioeconomic sectors
- Communication standards and channels
- Recording and cataloguing of events and impacts

Joint publications released from the four pillar agencies recently include *Leveraging AI to Enhance Multi-Hazard Early Warning Systems* (July 2026), *Early Warnings Systems for Mobile Populations* (July 2026) and *After Event Review (AER)* (August 2026). In the near future, an EW4All Simulation Exercise Manual will be released.

7. **Regional to Global Consultations**

A regional-to-global consultation process is now underway to review progress, identify priorities, and shape the next phase of cooperation beyond 2027. These discussions will feed into a global process culminating in 2027. Insights from the Pacific, including the PMC and PMMM meetings, as well as pre-COP, will be influential in the consultative process around the post-2027 early warnings landscape.

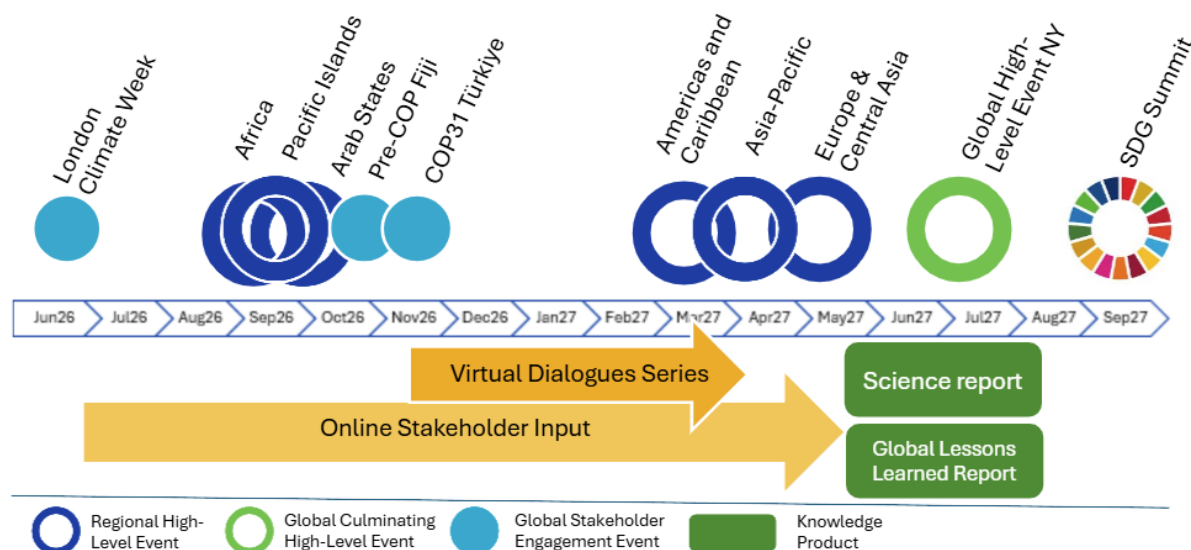


Figure 1 - Schematic of consultation processes (not all potential opportunities are included). Note: Events are subject to change.

8. **Status in the South-West Pacific**

The five initial South-West Pacific Region Members to receive targeted support under the initiative (Fiji, Kiribati, Samoa, Solomon Islands, and Tonga) conducted national EW4All workshops and developed roadmaps to guide implementation. Samoa is also the first country in the Pacific to officially launch its national roadmap. As part of their national roadmaps, Kiribati, Samoa, Solomon Islands and Tonga have commenced the implementation of cell broadcast, which is currently ongoing. Beyond the initial five, other Members such as Timor-Leste, Papua New

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Guinea, and Vanuatu have expressed interest in joining the initiative, while several others are already making notable progress in expanding early warning coverage. In the Pacific, RA V Members and its expert groups and the WMO Secretariat are closely collaborating with the Secretariat of the Pacific Regional Environment Programme (SPREP) and its WRP Programme, which continues to be a key vehicle for EW4All implementation in the Pacific. This included in-country workshops to implement CAP and impact-based forecast and warning services (IBFWS). In Southeast Asia, WMO Members and the Secretariat, together with EW4All partners and the Association of Southeast Asian Nations (ASEAN) Secretariat have been working on a regional roadmap to scale-up EW4All, aligned with the ASEAN Agreement on Disaster Management and Emergency Response (AADMER) Work Programme 2026-2030.

9. Phase I of the nineteenth session of RA V (RA V-19(I)) in September 2025 established a Task Team on EW4All to help integrate the WMO Roadmap for contributing to EW4All in the RA V Operating Plan and ensure coordinated action across all RA V working bodies and the link to partners, notably SPREP/WRP, ASEAN, EW4All Pillar leads, and others.
10. As of August 2026, WMO is implementing seven extrabudgetary (XB) projects in RA V, with approximately CHF 12.5 million invested and supporting 21 RA V Members. WMO is actively working with Members and partners to mobilize additional resources, and several other projects are already in the pipeline. For an overview of and coordination with projects targeting NMHSs of RA V Members (both those managed by WMO and those managed by others), please see the [WMO projects page](#), Pacific Partner Coordination Mechanism (PPCM) Dashboard as well as the [Global Observatory for Early Warning System Investments](#). All these projects have been critical for advancing EW4All, especially in the Pacific.

Recommendations:

11. The Meeting is invited to:

- I. Note that consultations are underway on the progress made in EW4All and the future of the initiative and consider providing respective feedback through various channels,
 - II. Note the passing of new early warning services technical regulations by WMO, and several joint publications on the use of AI in early warning processes, the conducting of After-Event Reviews, and early warning services for mobile populations in fragile, conflict and violence-affected settings.
 - III. Affirm that it is appropriate to continue to keep universal early warnings high on the global agenda, noting also the importance of supporting Weather Ready Pacific and Pacific-led strategies in this context,
 - IV. Recommend harmonising the principles of EW4All in regional and national plans, and updating or drafting EW4All Roadmaps and ensuring consistency with national and regional strategies.
 - V. Request entities leading each EW4All Pillar at the national level to continue and where necessary strengthen the national MHEWS coordination and the engagement with the regional and global EW4All Pillar leads and partners (report progress, share information, etc.), in order to ensure effective operation and international support.
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