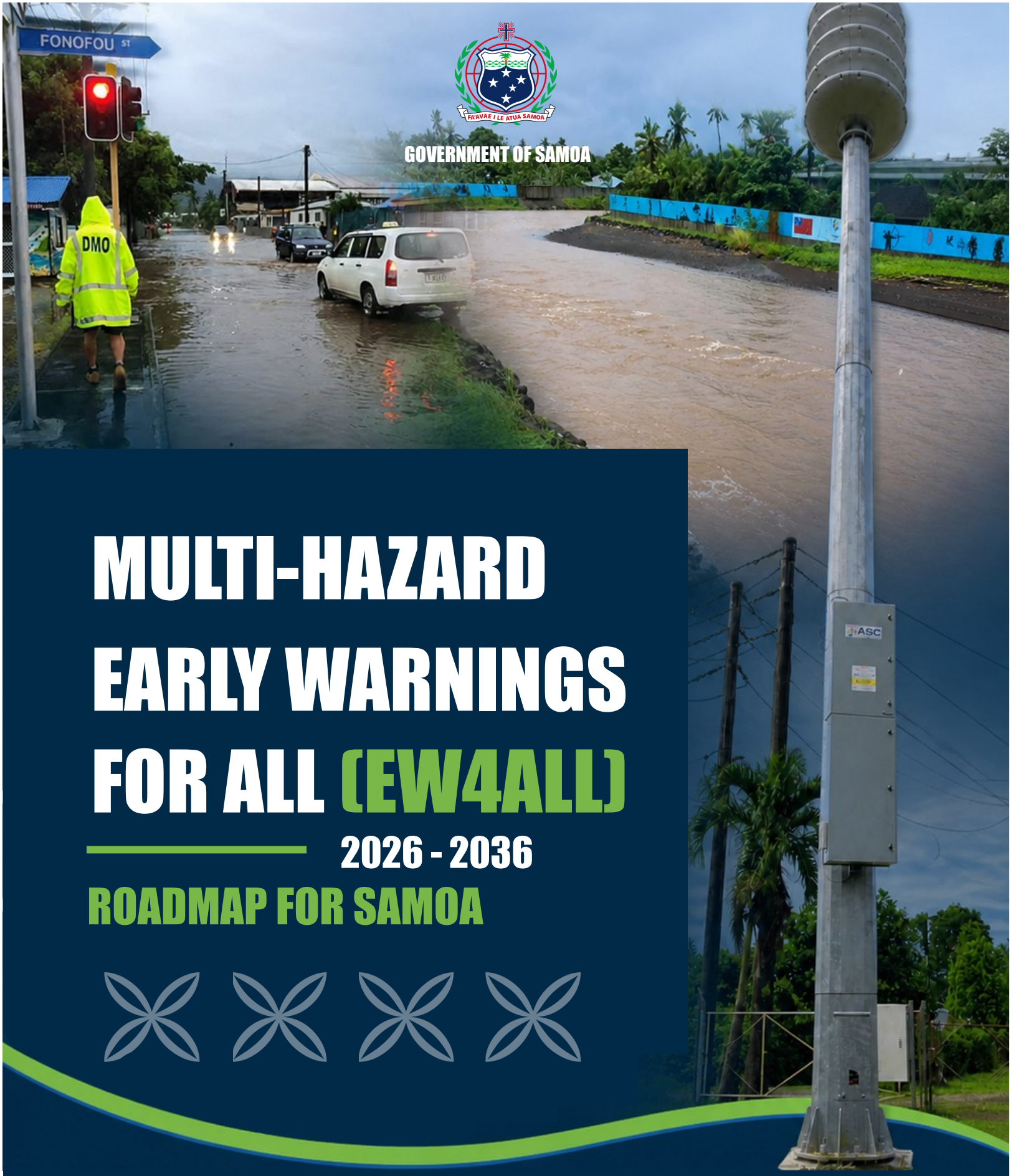

GOVERNMENT OF SAMOA

MULTI-HAZARD EARLY WARNINGS FOR ALL (EW4ALL)

2026 - 2036

ROADMAP FOR SAMOA

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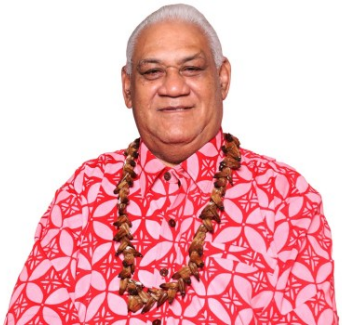
ACRONYMS

ADB	Asian Development Bank
BGAN	Broadband Global Area Network
CAP	Common Alerting Protocol
CDCC	Climate and Disaster Coordination Committee
CEO	Chief Executive Officer
CPD	Climate and Disaster Programme
DAC	Disaster Advisory Committee
DFAT	Department of Foreign Affairs and Trade (Australia)
DMO	Disaster Management Office
DRM	Disaster Risk Management
DRR	Disaster Risk Reduction
EU	European Union
EW4All	Early Warnings for All
EWS	Early Warning System
FFGS	Flash Flood Guidance System
FRDP	Framework for Resilient Development in the Pacific
GCF	Green Climate Fund
GDP	Gross Domestic Product
GEDSI	Gender Equality, Disability and Social Inclusion
HR	Human Resources
ICT	Information and Communication Technology
IFRC	International Federation of Red Cross and Red Crescent Societies
IMF	International Monetary Fund
ITU	International Telecommunication Union
JICA	Japan International Cooperation Agency
M&E	Monitoring and Evaluation
MAF	Ministry of Agriculture and Fisheries
MCIT	Ministry of Communications and Information Technology
MHEWS	Multi-Hazard Early Warning System
MNRE	Ministry of Natural Resources and Environment
MoF	Ministry of Finance
MoH	Ministry of Health
MoU	Memorandum of Understanding
MWCSD	Ministry of Women, Community and Social Development
NAPA	National Adaptation Programme of Action
NDC	National Disaster Council

ACRONYMS

NDMO	National Disaster Management Office
NEOC	National Emergency Operations Centre
NESP	National Environment Sector Plan
NETOP	National Emergency Telecommunications Operational Plan
NGO	Non-Governmental Organization
PCRAFI	Pacific Catastrophe Risk Assessment and Financing Initiative
PCRIC	Pacific Catastrophe Risk Insurance Company
PDS	Pathway for the Development of Samoa
PIMS	Pacific Islands Meteorological Strategy
PPP	Public–Private Partnership
PSLGM	Pacific Sea Level and Geodetic Monitoring Project
RedR	Registered Engineers for Disaster Relief
SADD	Sex, age, and disability disaggregated
SBS	Samoa Bureau of Statistics
SDG	Sustainable Development Goals
SFESA	Samoa Fire and Emergency Services Authority
SIDS	Small Island Developing State
SoE	State of Environment
SOP	Standard Operating Procedures
SPC	Secretariat of the Pacific Community
SPREP	Secretariat of the Pacific Regional Environment Programme
ToC	Theory of Change
ToR	Terms of Reference
UN	United Nations
UNDP	United Nations Development Programme
UNDRR	United Nations Office for Disaster Risk Reduction
UNESCAP	United Nations Economic and Social Commission for Asia and the Pacific
WMO	World Meteorological Organization
WRP	Weather Ready Pacific

FOREWORD



Samoa stands at the frontline of climate and disaster risk. Our islands, people, and livelihoods are increasingly exposed to cyclones, floods, droughts, tsunamis, and sea-level rise. A single event can erase decades of development gains, as witnessed during the 2009 tsunami and Cyclone Evan in 2012. These experiences remind us of the urgent need to act decisively and collectively.

The Multi-Hazard Early Warning for All Roadmap 2026–2036 represents Samoa's commitment to strengthen the protection of all people and communities. The roadmap provides a clear pathway to strengthen risk knowledge, monitoring and forecasting, warning dissemination, preparedness, and governance. Anchored in national policies and aligned with international frameworks such as the Sendai Framework for Disaster Risk Reduction and the Sustainable Development Goals, it integrates modern technology with traditional knowledge to support inclusive and sustainable approaches to resilience.

Developed through extensive consultation with communities, government agencies, civil society, and regional partners, the roadmap is both costed and practical. It promotes people-centered approaches, gender and disability responsiveness, and community ownership. Investments in interoperable ICT systems, inclusive communication channels, and emergency response centres will strengthen Samoa's end-to-end early warning systems and preparedness and response at all levels.

This roadmap reflects Samoa's ongoing commitment to strengthening resilience, safeguarding lives and livelihoods, and supporting sustainable development. I commend this roadmap to all stakeholders and encourage continued collaboration and partnership in achieving its vision of timely, trusted, and effective multi-hazard early warning systems for all people in Samoa.

God Bless Samoa.

Hon. Ale Vena Ale

Minister
Ministry of Natural Resources and Environment

MINISTRY OF NATURAL RESOURCES AND ENVIRONMENT
FAAVAE I LE ATUA SAMOA

Early Warnings for All

PLAN PREPARE PROTECT
KEEP YOUR AIGA SAFE

SAMOA METEOROLOGICAL SERVICES
MNRE

WATER RESOURCES DIVISION

EXECUTIVE SUMMARY

Samoa's Multi Hazard Early Warnings for All (EW4All) Roadmap 2026-2036 provides a strategic framework to strengthen national resilience against disasters and climate risks, building on global commitments such as the Sendai Framework for Disaster Risk Reduction 2015-2030 and the Sustainable Development Goals (SDGs). As one of the world's most climate-vulnerable nations, Samoa faces high exposure to cyclones, floods, droughts, tsunamis, and sea level rise, with disasters regularly causing economic shocks of up to 30% of Gross Domestic Product (GDP)[1]. The roadmap identifies and responds to these risks by modernizing hazard data platforms, strengthening Information, Communication, and Technology (ICT) systems, expanding inclusive communication channels, embedding preparedness through community drills and training, and institutionalizing monitoring and evaluation (M&E). Anchored in national policies, it creates a coherent architecture that links resilience, financing, governance, and inclusivity.

The EW4All Roadmap vision is that by 2030 every person in Samoa will be protected by timely, trusted, and actionable multi-hazard early warning systems (MHEWSs). The roadmap emphasizes people-centered design, inclusivity for vulnerable groups, and integration of science with traditional knowledge. Coordinated action across five pillars—risk knowledge, detection and forecasting, dissemination and communication, preparedness and response, and governance and financing—lays out a clear pathway to build a comprehensive, sustainable, and early warning system (EWS). Its Theory of Change (ToC) identifies key gaps and addresses them through targeted activities such as digitizing maps, installing sensors, expanding communication channels, and strengthening financing, delivering outputs like interoperable ICT, inclusive warnings, and surge-ready emergency centers.

Samoa's national context underscores the urgency of this effort, with climate projections showing rising temperatures, more extreme rainfall, stronger cyclones, and accelerating sea level rise through 2050 and 2100. These trends threaten livelihoods, infrastructure, and ecosystems, amplifying risks of flooding, droughts, erosion, and salinization, while ocean warming and acidification undermine fisheries and coastal protection. To meet these challenges, Samoa, working closely with its partners, has made significant progress in establishing multi-hazard early warning systems and strengthening disaster risk management, climate change, and meteorological policies, supported by strong national coordination and regional partnerships. This positions Samoa to scale up its Multi-Hazard EW4All Roadmap, achieve universal protection by 2027 and beyond, and serve as a regional model for inclusive, resilient disaster governance.

[1] International Monetary Fund. Fiscal Affairs Dept. "Samoa: Technical Assistance Report—Climate Macroeconomic Assessment Program", IMF Staff Country Reports 2022, 083 (2022), accessed 2/16/2026, https://doi.org/10.5089/9798400205569.002 https://www.imf.org/-/media/files/publications/cr/2022/english/1wsmea2022001.pdf

EXECUTIVE SUMMARY

Pillar 1: Disaster Risk Knowledge of the Roadmap identifies the need to strengthen Samoa's ability to anticipate hazards by consolidating fragmented data into a centralized, interoperable platform, modernizing ICT systems, and digitizing hazard maps. It embeds inclusivity through formats such as braille, bilingual translations, and pictorial versions, while enhancing monitoring and statistical systems to produce sex, age, and disability disaggregated data. Traditional knowledge will be documented and integrated with scientific research, supported by scholarships and participatory studies to build national expertise. Budget estimate: USD 16.5 million**.**

Pillar 2: Detection, Observation, Monitoring, Analysis, and Forecasting focuses on expanding observation networks, embedding real time telemetry, and institutionalizing quality assurance standards to strengthen hazard monitoring. Workforce capacity will be built through scholarships, continuous professional development, and retention strategies, while inter-agency coordination will improve via centralized repositories and formalized protocols. Forecasts will be simplified into accessible formats such as infographics and radio scripts, supported by community training and feedback mechanisms. Budget estimate: USD 25.5 million.

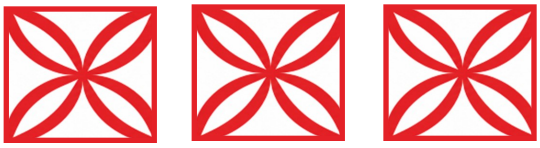
Pillar 3: Warning Dissemination and Communication expands coverage in rural and outer islands through sirens, loudspeakers, and cell broadcast systems, while modernizing radio and SMS networks to create a multi channel platform. Inclusive communication templates in braille, sign language, and pictorial formats will ensure accessibility for all, supported by harmonized Standard Operating Procedures (SOPs), telecom integration, and continuous improvement through feedback loops. Budget estimate: USD 20.25 million**.**

Pillar 4: Disaster Preparedness and Response Capabilities strengthens readiness by updating contingency plans, institutionalizing after action reviews, scaling nationwide drills, and modernizing emergency assets such as telecom stockpiles, backup systems, and rescue equipment. Community ownership will be deepened through disaster risk management (DRM village) committees, non-governmental organizations (NGO) grants, and participatory workshops. Budget estimate: USD 15.75 **million.**

Pillar 5: Governance, Coordination, Advocacy, M&E and Financing unifies disaster governance by clarifying mandates, diversifying financing through disaster funds, levies, public-private partnerships (PPPs), and insurance schemes, and expanding staffing and surge capacity at the National Emergency Operations Centre (NEOC). It embeds inclusivity and accountability through Gender Equality, Disability, and Social Inclusion (GEDSI) mainstreaming, monitoring frameworks, and safeguards. Budget estimate: USD 6.45 million.

The implementation of Samoa's Multi Hazard *EW4All Roadmap* will be led by a MHEWS Task Force chaired by the Chief Executive Officer (CEO) of the Ministry of Natural Resources and Environment (MNRE), with the Meteorology, Geoscience and Ozone Services Division as secretariat, ensuring inclusive

EXECUTIVE SUMMARY



participation from government, state owned enterprises, NGOs, and civil society. Financing will combine domestic resource mobilization—through expansion of the National Disaster Fund, levies, risk transfer mechanisms, and public-private partnerships—with external support from multilateral, regional, and bilateral partners, phased to build fiscal space, blended models, and transparent audits over time. A robust M&E framework, guided by results based management and a ToC, will track progress across all five pillars through annual reporting, quarterly tracking, independent audits, and community feedback. Mid-term and final evaluations will assess sustainability and impact, while public scorecards, executive briefs, and accessible community reports will embed transparency, inclusivity, and accountability into Samoa's disaster governance system.

1. BACKGROUND: THE EARLY WARNINGS FOR ALL (EW4ALL) INITIATIVE

The Sustainable Development Goals (SDGs) and the Sendai Framework for Disaster Risk Reduction 2015-2030 identify strengthened early warning systems (EWSs) as a critical component of building the resilience to disasters and crises and, by extension, contributing to sustainable development.

EWSs are key elements of disaster risk reduction (DRR) and climate change adaptation, as they help reduce or avoid the detrimental impacts of hazardous events. To be effective, EWSs need to be risk-informed, target communities most at risk, disseminate messages and warnings efficiently, ensure preparedness and support early action. EWSs must rely on a sound scientific and technical basis and focus on the most vulnerable people and sectors. This implies the adoption of a system-based approach incorporating all relevant risk factors, whether arising from the climate-hazards or social vulnerabilities, and from short-term or long-term processes.

Early warning systems have four pillars: risk knowledge, monitoring/forecasting, warning dissemination, and preparedness/response.

Multi-sector and multi-stakeholder coordination, involvement of communities at risk, having an enabling institutional and legislative environment, clear roles and responsibilities, and adequate operational capacities, are essential for effective and consistent EWSs.

Early Warnings for All (EW4All) is a special initiative of the United Nations (UN) Secretary General, which aims to spearheading action to ensure every person on Earth is protected by EWSs by 2027. Under the umbrella of EW4All, Samoa aims to scale up prior efforts and strengthen its national EWS.

Samoa is ranked among the world's most climate-vulnerable nations, with a current ND-GAIN vulnerability score of 0.47 (2023), placing it 60th globally[2]. This vulnerability is driven by high exposure to tropical cyclones, floods, droughts, tsunamis, and sea level rise, compounded by sensitivity in housing, agriculture, health systems, and marine ecosystems. As a Small Island Developing State (SIDS), Samoa's limited adaptive capacity and the concentration of 70% of its 200,000 people and infrastructure along low-lying coastal fringes significantly heighten its risk profile.

Disaster risk modeling by the Pacific Catastrophe Risk Assessment and Financing Initiative (PCRAFI) estimates average annual losses of approximately US$10 million from tropical cyclones and earthquakes. Over the next 50 years, Samoa faces a 50% probability of losses exceeding US$130 million and a 10% probability of losses exceeding US$350 million[3]. These figures underscore the severe fiscal risks, with single disasters capable of erasing 20–30% of GDP. Historical events illustrate this vulnerability: the 2009 tsunami resulted in 143 deaths and damages equivalent to 22% of GDP[4], while Cyclone Evan (2012) displaced 7,500 people,

[2]Notre Dame Global Adaptation Initiative. (2025). *Country Index Rankings and Vulnerability Scores*. University of Notre Dame Pacific Catastrophe Risk Assessment and
[3]Financing Initiative (PCRAFI). *Country Risk Profile: Samoa*. September 2011
[4]Global Facility for Disaster Reduction and Recovery (GFDRR). *Samoa – 2009 PDNA assessed total earthquake and tsunami impact at 22% of GDP*. October 2009.

caused 12 deaths, and damages equivalent to 28% of GDP[5]. Over the past 12 years, Samoa has endured nine major disasters, with economic losses ranging from 0.1% to 30% of GDP[6].

The World Bank Climate Risk Profile (2021) confirms Samoa's high exposure to tropical cyclones, floods, and droughts, with climate change expected to intensify these hazards. Rising sea levels threaten coastal infrastructure, housing, and ecosystems, while health risks include vector-borne diseases and water contamination during floods[7]. Similarly, the Pacific Risk Profile (DFAT, 2020) highlights Samoa's geographic vulnerability, noting that most settlements are concentrated on low-lying coastal fringes, leaving people and assets highly exposed. It emphasizes the country's economic fragility, with disasters regularly causing GDP shocks between 0.1% and 30%[8].

At the community level, the SPREP Community Vulnerability and Adaptation Assessment (2018) shows that while communities are adapting, they face increasing climate extremes. Impacts include crop losses, salinization of coastal springs, poor water quality, and disease outbreaks, with limited coping capacity in rural and coastal villages, especially among vulnerable groups[9].

Institutional arrangements for disaster risk management are established and still evolving. The National Disaster Council (NDC) provides policy oversight, while the Disaster Advisory Committee (DAC) ensures technical validation and evidence-based decision making. The Disaster Management Office (DMO) serves as the operational hub for preparedness, response, and recovery. The Meteorology Division (MNRE) and MCIT lead hazard monitoring and warning dissemination, supported by village councils, churches, schools, and NGOs to ensure warnings reach vulnerable groups.

Samoa's national policy frameworks collectively reinforce the priority of building resilient, inclusive EWSs. The Pathway for the Development of Samoa (PDS 2021/22–2025/26) underscores that intensification of extreme weather will heighten disaster frequency and scale, posing risks to long-term development. To safeguard the economy and communities, the Disaster Risk Financing Policy (2022–2025), developed with the World Bank under the Pacific Resilience Program, introduces instruments to buffer disaster shocks. Complementing this, the National Environment Sector Plan (NESP 2023–2027) identifies EWSs as a critical resilience priority, calling for stronger coordination, integration of science and traditional knowledge, and investment in multi-hazard monitoring. The State of Environment (SoE 2023) report reinforces these priorities, acknowledging progress in Samoa's early warning capacity while highlighting gaps in coverage, inclusivity, and sustainable financing, and urging institutional strengthening and community-centered approaches.

Disaster governance has been further consolidated through recent and emerging frameworks. The Multi-Hazard Early Warning Systems (MHEWS) Policy 2022–2032 establishes an integrated, impact-based forecasting to warnings, emphasizing actionable information, interoperability, and community-centered disse-

[5]Government of Samoa. *Post-Disaster Needs Assessment: Cyclone Evan 2012*. March 2013.
[6]Pacific Catastrophe Risk Insurance Company (PCRIC). *Samoa's Disaster Risk Financing Policy 2022–2025*. March 2025
[7]World Bank & GFDRR. *Climate Risk Profile: Samoa*. Washington, DC: World Bank Group, 2021.
[8]Australian Government Department of Foreign Affairs and Trade (DFAT). *Pacific Risk Profile: Samoa*. Canberra: DFAT, 2020.
[9]Secretariat of the Pacific Regional Environment Programme (SPREP). *Community Vulnerability and Adaptation Assessment in Samoa*. Apia: SPREP, 2018.

mination. The Disaster Risk Management Policy 2024 updates national priorities in line with the Sendai Framework and SDGs, enhancing cross-ministerial coordination, clarifying institutional roles, and embedding resilience into national planning. Building on this, the draft National Disaster Management Plan 2025 expands hazard coverage to climate, health, and human-induced risks, and sets out operational procedures for preparedness, response, and recovery, currently under stakeholder consultation. Together, these frameworks create a coherent architecture that links resilience, financing, governance, and inclusivity, ensuring Samoa's Multi-Hazard EW4All Roadmap 2026-2036 is firmly anchored in national policy and institutional practice.

The EW4All initiative offers Samoa a global framework to scale up national efforts. Under EW4All, Samoa aims to:

- Modernize its multi-hazard data platform and hazard maps.
- Strengthening ICT interoperability to improve data sharing
- Strengthen redundancy systems for backup.
- Expand inclusive communication channels to reach vulnerable groups.
- Embed a culture of preparedness and response through drills, training, and community ownership.
- Institutionalize monitoring and evaluation frameworks to track progress and accountability

1.1. VISION

The EW4All initiative envisions a future where every person in Samoa is protected by timely, trusted, and actionable multi-hazard early warnings. Building on the PDS, NESP, SoE, MHEWS Policy 2022–2032, and DRM Policy 2024, Samoa is strengthening its institutional and technical frameworks to deliver integrated, impact-based warnings that go beyond forecasts from what the weather will *be* to what the weather will *do* to provide clear guidance for households, businesses, and communities. These policies emphasize interoperability, cross-ministerial coordination, and resilience planning, ensuring that warnings are inclusive, community-centered, and aligned with the Sendai Framework and the SDGs.

By 2030 and beyond, Samoa's vision is to embed a culture of preparedness and response across society, supported by modernized hazard data platforms, resilient ICT systems, and sustainable financing mechanisms. Communities — especially vulnerable groups — will be empowered to act early, reducing losses and safeguarding livelihoods. With strong national policies, institutional arrangements, and regional partnerships, EW4All positions Samoa to transform DRM into a cornerstone of sustainable development, ensuring that resilience is not only a technical achievement but a lived reality for all.

1.2. PURPOSE AND OBJECTIVES

Samoa's Multi hazard EW4All Roadmap 2026-2036 serves as a strategic guide to drive initiatives spanning national to local levels, channel investments towards enhancing EWSs for more effective DRR, and facilitate the seamless integration of comprehensive early warning mechanisms. Organizations are encouraged to incorporate these actions into their operational frameworks, aligning with their primary and supportive responsibilities. This harmonization ensures the optimal utilization of resources across the spectrum from

national to local levels.

The primary objective of this Roadmap is to provide the national and local governments with a structured blueprint for fortifying a people-centric EWS in Samoa through targeted actions and resource allocation. This Roadmap stems from an extensive gap analysis of Samoa's EWS, which included comprehensive literature reviews, stakeholders' consultations, one on one and focus groups consultations and workshops. This roadmap presents a set of recommended actions designed to prioritize investments in EWS and DRR, in accordance with Target G of the Sendai Framework, the Framework for Resilient Development in the Pacific (FRDP), the Pathway for the Development of Samoa, and relevant environment and DRR sector policies and plans

Collaboratively crafted with inputs from relevant EWS and DRR stakeholders, this Roadmap was developed by MNRE. It provides a basis for coordinated efforts among diverse national and local agencies, channeling focused programming and resource allocation towards scaling up the national EWS.

The recommendations presented herein are based on identified national gaps, priorities and needs and cover the four pillars as well as the inter-pillar domain of an EWS:

- Pillar 1: Disaster Risk Knowledge
- Pillar 2: Detection, Observation, Monitoring, Analysis, and Forecasting
- Pillar 3: Warning Dissemination, and Communication
- Pillar 4: Preparedness and Response Capabilities

Additionally, the Multi-Hazard EW4All Roadmap takes into account the interpillar domain (Pillar 5), covering aspects around governance, stakeholder coordination, advocacy, M&E and financing for EWSs. This holistic approach guarantees a comprehensive and well-rounded enhancement of Samoa's early warning infrastructure.

1.3. METHODOLOGY AND GUIDING PRINCIPLES

The methodology for developing Samoa's Multi Hazard EW4All Roadmap 2026-2036 combined a thorough literature review, primary data collection, stakeholder consultations, interview (one on one and focus groups) gaps analysis, and stakeholder validation. This process was anchored in guiding principles designed to ensure that EWSs are effective, inclusive, and sustainable.

Institutional buy-in was prioritized, recognizing that strong involvement and support from government agencies, technical institutions, and community stakeholders are essential for ownership and long-term sustainability. The roadmap emphasizes end-to-end EWSs, covering the full chain from hazard detection and risk analysis to the delivery of clear, understandable, and actionable messages that trigger timely response.

At the heart of Samoa's approach is a people-centered design, ensuring that systems empower individuals, households, and communities to act appropriately and reduce harm. This is reinforced by a commitment

to gender and disability responsive systems, which address the specific needs and vulnerabilities of women, men, and persons with disabilities. A child and youth-sensitive lens ensures that the unique capacities and needs of younger generations are integrated into preparedness and response. Finally, the principle of inclusiveness guarantees that early warnings reach all people — including marginalized and vulnerable communities — by tailoring communication channels and approaches to diverse needs and preferences.

Together, these guiding principles ensure that Samoa's Multi Hazard EW4All Roadmap is not only technically robust but also socially responsive, embedding resilience across institutions and communities while aligning with the Sendai Framework and the SDGs.

1.4. THEORY OF CHANGE

The Theory of Change for Samoa's *Multi Hazard Early Warnings for All (EW4ALL)* Roadmap outlines how targeted interventions across five pillars will collectively build a trusted, inclusive, and sustainable multi hazard early warning system. It begins by identifying critical gaps such as fragmented risk data, inadequate observation infrastructure, limited warning coverage, outdated contingency plans, and improvements in governance and financing systems. These gaps are addressed through activities like digitizing hazard maps, installing sensors, expanding multi-channel communication systems, strengthening community preparedness, training and capacity development, and establishing sustainable financing mechanisms. Each activity produces tangible outputs—such as operational data platforms, interoperable ICT systems, inclusive warning formats, and surge ready emergency centers—that feed into intermediate outcomes like integrated risk knowledge, reliable forecasts, community trust, and institutional readiness.

Together, these outcomes lead to pillar-level results: inclusive hazard data blending science and tradition, trusted detection and monitoring, resilient multi-channel communication, community-owned preparedness systems, and unified governance with sustainable financing. The cumulative impact is a comprehensive, people-centered disaster governance system that protects all communities, ensures inclusivity, and enables effective response. In essence, the roadmap provides a clear pathway from addressing systemic weaknesses to achieving a resilient national framework where early warnings are reliable, accessible, and empower communities to act decisively in the face of hazards.

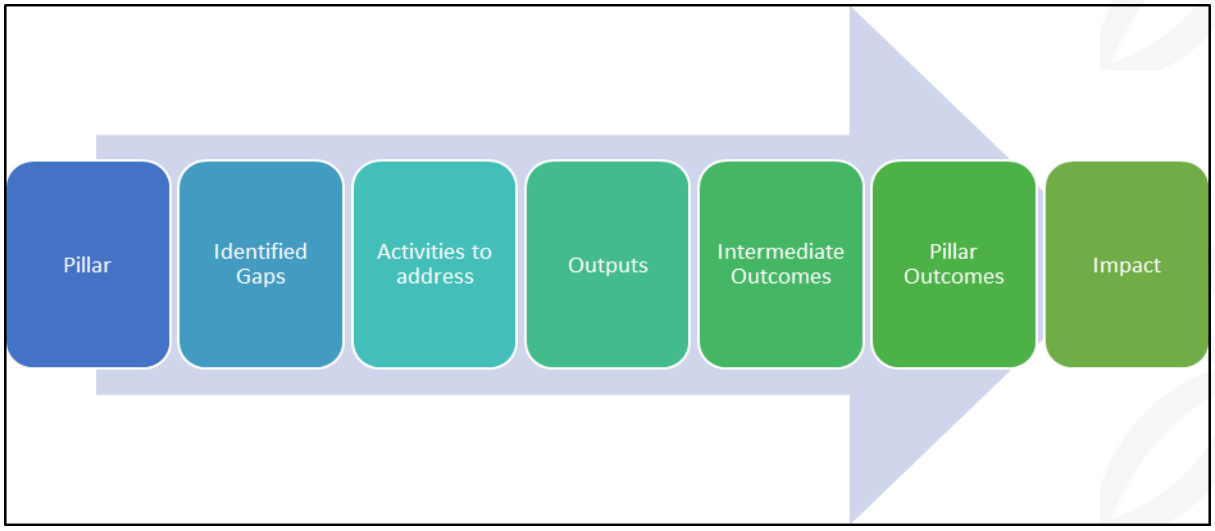


Figure 1: Theory of Change Process

2. SAMOA'S NATIONAL CONTEXT

2.1. CURRENT CLIMATE PROJECTIONS, TRENDS AND IMPACTS

Samoa's climate future is characterized by rising temperatures, more extreme rainfall, stronger tropical cyclones, and accelerating sea level rise through 2050 and 2100, with impacts cascading across environmental, economic, and social systems.

Multiple climate projections indicate that annual mean temperatures in the Pacific, including Samoa, will continue to rise throughout the 21st century under all plausible emissions scenarios. Near-surface temperatures in the South-West Pacific have recently reached record highs, and rising greenhouse gas concentrations will drive persistent warming and more frequent heat extremes. For Samoa, a projected average warming of around 0.6°C (0.4 to 1.1°C uncertainty range) from the 1986-2005 period out to 2020-2039 under all emissions pathways was reported. By 2090, Samoa is projected to warm by 2.0 to 4.0°C for very high emissions (RCP8.5) and 0.3 to 1.2°C for very low emissions (RCP2.6)[10] [11]. Increases in average temperatures will also result in a rise in the number of hot days and warm nights, and a decline in cooler weather[12].

Rainfall patterns are expected to become more variable, with models suggesting a tendency towards wetter wet seasons and drier dry seasons. Extreme rainfall events are likely to intensify, increasing risks of flooding and landslides, while prolonged droughts may occur more often, particularly during El Niño years.

Tropical cyclones may occur less frequently overall, but those that do form are projected to be more intense, with stronger winds and heavier rainfall, amplifying damage potential. Sea levels around Samoa are expected to rise by 0.25–0.60 m by 2100 under moderate scenarios, and up to 1.1 m under high emission scenarios, threatening coastal communities, infrastructure, and freshwater supplies through flooding, erosion, and salinization. Ocean changes will further compound risks: sea surface temperatures are projected to rise by 1–3°C by 2100, driving coral bleaching, while ocean acidification will weaken reef resilience, undermining fisheries and natural coastal protection. Together, these trends pose significant threats to Samoa's livelihoods, ecosystems, and long term development, reinforcing the urgency of robust EWSs and climate change adaptation measures.

[10]CSIRO and SPREP (2021). 'NextGen' Projections for the Western Tropical Pacific: Current and Future Climate for Samoa. Final report to the Australia-Pacific Climate Partnership for the Next Generation Climate Projections for the Western Tropical Pacific project. Commonwealth Scientific and Industrial Research Organisation (CSIRO) and Secretariat of the Pacific Regional Environment Programme (SPREP), CSIRO Technical Report, Melbourne, Australia. https://doi.org/10.25919/p7es-kt49 https://www.rccap.org/uploads/files/3d1f9129-d2c7-4226-a213-6cbb73b0230e/Samoa%20Country%20Report%20Final.pdf\|

[11]IIPCC WGI AR6 Regional Fact Sheet on Small Islands https://www.ipcc.ch/report/ar6/wg1/downloads/factsheets/IPCC_AR6_WGI_Regional_Fact_Sheet_Small_Islands.pdf

[12]https://www.pacificclimatechangescience.org/wp-content/uploads/2013/06/3_PACCSAP-Samoa-10pp_WEB.pdf

2.2. POLICY AND LEGISLATIVE FRAMEWORKS

Samoa's approach to EWSs is firmly anchored in global frameworks such as the 2030 Agenda for Sustainable Development and the Sendai Framework for Disaster Risk Reduction 2015–2030. In particular, Sendai Target (g) calls for a substantial increase in the availability and accessibility of MHEWSs and disaster risk information by 2030, setting clear indicators for measuring effectiveness. This priority builds on earlier commitments under the Hyogo Framework for Action and insights from international conferences on early warning, which emphasized EWSs as a matter of policy and provided practical tools such as the Community Early Warning Systems Toolkit[13] and guidance on impact-based forecasting for early action.[14 15 16]

In 2019, Samoa developed the National Emergency Telecommunications Operational Plan (NETOP), which outlines how telecommunications facilities should be used before, during, and after an incident to prevent, mitigate, and respond to its effects .At the regional level, Samoa's EWS development is guided by the FRDP 2017–2030, which promotes integrated action on disaster resilience and climate change, and the Pacific Islands Meteorological Strategy (PIMS) 2017–2026, which calls for strengthened capacity to implement MHEWS across multiple hazards. Furthermore, Samoa is a Member of WMO in its Regional Association V (South-West Pacific), benefitting from various WMO systems, frameworks, and initiatives in the region.

Nationally, Samoa has embedded EWS priorities into a wide range of policies and strategies, including the Pathway for the Development of Samoa (PDS 2021/22–2025/26), the National Disaster Management Plan (2016–2020, now under review and being updated for 2025), the Samoa Climate Change Policy (2020), the National Emergency Telecommunications Operation Plan and sectoral plans for environment, water, sanitation, and forestry. In addition, Samoa is developing a National Framework for Climate Services (NFCS) with support from the EU-funded ClimSA Programme, which aims to strengthen the production, coordination, and user uptake of climate information services across priority sectors. Complementary legislation such as the Disaster and Emergency Management Act (2007), the Meteorology, Geoscience and Ozone Services Act (2021), and the Village Fono Act (1990) — provides the legal foundation for hazard monitoring, emergency response, and community engagement.

Comparatively, Samoa is regarded as a regional leader in EWS policy and legislative frameworks. Samoa's combination of national legislation, sectoral policies, and community governance structures — reinforced by the MHEWS Policy (2023–2025) — provides one of the most holistic frameworks in the Pacific, ensuring warnings are not only technically sound but also socially inclusive and legally enforceable.

Together, these frameworks and instruments ensure that Samoa's EWS is multi-hazard, people-centered, and inclusive, aligning with international best practice while reflecting national priorities.

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[13] International Federation of Red Cross and Red Crescent Societies (IFRC). *Community Early Warning Systems (CEWS): Training Toolkit – Field Guide. https://www.ifrc.org/sites/default/files/1275000-Community-Early-Warning-Systems-Toolkit-EN.pdf*

[14] World Meteorological Organization (WMO). *WMO Guidelines on Multi-hazard Impact-based Forecast and Warning Services* (WMO-No. 1150) https://etrp.wmo.int/pluginfile.php/42254/mod_page/content/18/WMO-1150_multihazard-guidelines_en.pdf

[15] IFRC / Red Cross Red Crescent Climate Centre (with partners incl. UK Met Office). *The Future of Forecasts: Impact-based Forecasting for Early Action* (guide). https://www.climatecentre.org/downloads/files/Standalone_Impact%20based%20forecasting%20guide%202020.pdf

[16] UNESCAP. *Manual for Operationalizing Impact-based Forecasting and Warning Services https://www.unescap.org/sites/default/d8files/knowledge-products/IBFWS%20Manual_FINAL.pdf*

The MHEWS Policy (2022–2032) consolidates these commitments, providing a technical and institutional framework for integrated systems that deliver actionable information, strengthen interoperability, and ensure warnings reach all communities — including women, children, persons with disabilities, and marginalized groups. This comprehensive policy environment positions Samoa to scale up its Multi Hazard EW4All Roadmap and achieve universal protection by 2027 and beyond, while serving as a regional model for other Pacific Island Countries seeking to strengthen their early warning governance.

2.3. INSTITUTIONAL AND COORDINATION FRAMEWORKS

Samoa's institutional framework for Early Warning Systems is anchored in strong national governance. At the apex, the National Disaster Council (NDC) provides strategic oversight and ensures EWS priorities are embedded in national development planning. The Disaster Advisory Committee (DAC) offers technical guidance, while the National Disaster Management Office (NDMO) serves as the operational lead for preparedness, response, and recovery under the Disaster and Emergency Management Act (2007).

The Ministry of Natural Resources and Environment (MNRE), through its Meteorology, Geoscience and Ozone Services Division, leads hazard monitoring and forecasting, while the Ministry of Finance ensures disaster risk financing and integration of EWS into national planning. At the sectoral level, specialized ministries and agencies provide hazard-Specific expertise:

- *Ministry of Health (MoH):* Leads epidemic surveillance, climate-sensitive health risks, and health emergency preparedness.
- *Ministry of Agriculture and Fisheries (MAF):* Addresses droughts, pests, food security, and agricultural resilience.
- *Samoa Fire and Emergency Services Authority (SFESA):* Provides operational emergency response, search and rescue, and supports warning dissemination.
- *Water Resources Division (MNRE)*: Monitors hydrological hazards, including floods and droughts, and coleads preparedness for water security.
- *Ministry of Communication and Information Technology (MCIT): Ensures connectivity and broadband access across the nation by advancing Samoa's telecommunications infrastructure, ICT systems, and enabling digital transformation*
- *Ministry of Women, Community and Social Development (MWCSD)*: Ensures community mobilization and inclusion of vulnerable groups in preparedness and response.
- National and international NGOs—including the Samoa Red Cross Society, Adventist Development and Relief Agency (ADRA Samoa), and Caritas Samoa—support preparedness, early action, relief coordination, and community outreach. These organizations complement government systems by strengthening last-mile connectivity and trust-based communication at village and household levels. [17] [18]

[17] Virginia Pycroft, 2015, Capacity building and disaster response: A case study of NGOs' response to cyclone Evan in Samoa. https://mro.massey.ac.nz/server/api/core/bitstreams/0284396d-b551-45b8-9845-1ccc02656795/content

[18] Samoa Red Cross climate risk & preparedness initiatives. https://ctk.climatecentre.org/downloads/modules/training_downloads/2b%20Samoa%20Red%20Cross%20Society%20factsheet%20on%20climate.pdf

Aligned with the EW4All pillars, Samoa's institutional responsibilities are structured as follows:

- *Pillar 1: Disaster Risk Knowledge* – National lead: NDMO; International lead: UNDRR. Linkage: National risk assessments feed into UNDRR's global monitoring systems.
- *Pillar 2: Detection, Observation, Monitoring, Forecasting* – National lead: MNRE Meteorology Division; International lead: WMO. Linkage: Forecasting systems align with WMO standards for interoperability.
- *Pillar 3: Warning Dissemination and Communication* – National Co- leads: MNRE- DMO and MCIT; International lead: ITU. Linkage: Enhanced warning dissemination channels with ITU support to ensure inclusive and people-centered communication.
- *Pillar 4: Preparedness and Response Capacity* – National leads: MNRE-DMO, Water Resources Division; Key national partners: Samoa Red Cross Society, SFESA, ADRA Samoa, Caritas Samoa, and other accredited NGOs; International lead: IFRC. Linkage: Collaboration strengthens community disaster committees, embeds inclusive preparedness, and scales up early action protocols.

At the community level, Village Councils (Fono) are legally empowered under the Village Fono Act (1990) to enforce preparedness measures and mobilize response. Local structures such as Community Disaster and Climate Committees (CDCCs), alongside churches, schools, and NGOs, act as trusted communication channels to ensure warnings reach households, including vulnerable groups such as women, youth, and persons with disabilities.

Regionally and internationally, Samoa benefits from partnerships with SPREP, SPC, WMO, UNDRR, IFRC, World Bank, DFAT, MFAT and the EU, which provide technical expertise, financing, and capacity building. Frameworks such as the Pacific Islands Meteorological Strategy (2017–2026) and the Framework for Resilient Development in the Pacific (2017–2030) further strengthen Samoa's institutional arrangements by embedding EWS into broader resilience and climate adaptation strategies.

3. SAMOA'S MULTI HAZARD EARLY WARNING FOR ALL ROADMAP

3.1. PILLAR 1: DISASTER RISK KNOWLEDGE

3.1.1. Gaps Identification

Samoa's disaster risk knowledge systems have a strong foundation but there are clear opportunities to enhance coordination and accessibility. Hazard and risk data are currently managed across multiple agencies, which creates room to establish a centralized platform that supports integrated planning. The *UNDRR Disaster Risk Reduction Status Report for Samoa (2022)* notes that data collection is spread across institutions, limiting interoperability—an opportunity to streamline systems and improve accessibility. ICT infrastructure, while functional, could be modernized to improve connectivity and interoperability, especially in rural areas. The *UNESCAP Pacific Digital Transformation Report (2021)* highlights that strengthening ICT systems would allow them to play a more effective role in disaster risk management. Hazard maps, meanwhile, could be updated and digitized to ensure planners and communities have up to date, user-friendly tools. The *National Disaster Management Plan 2017–2020* acknowledges that maps and risk assessments are inconsistently digitized, pointing to the value of systematic updates. Dissemination practices also offer scope for improvement, with the *Samoa National Action Plan for DRM 2017–2021* noting that hazard information does not always reach vulnerable groups—an opportunity to expand formats such as braille, bilingual translations, and pictorial versions.

Monitoring and evaluation capacity is another area where Samoa can grow. A comprehensive national DRR framework and dashboards would strengthen accountability and track progress more effectively. The *UNDRR 2022 Status Report* highlights the absence of such frameworks, suggesting the potential to institutionalize annual review cycles and dashboards. Statistical systems could also be enhanced to produce sex, age, and disability disaggregated (SADD) data, which would support evidence based planning. The *Samoa Bureau of Statistics (SBS) 2020 Review* identified gaps in disaggregated data collection, particularly for disability and gender, underscoring the opportunity to expand training for enumerators and strengthen community partnerships.

Traditional knowledge represents a valuable but underutilized resource. Indigenous forecasting methods are largely oral and at risk of being lost; Pacific regional instruments such as the *Framework for Resilient Development in the Pacific (FRDP) 2017-2030* emphasize inclusive resilience building involving communities, civil society, and local knowledge system. Documenting and validating traditional practices through initiatives such as the SPREP-COSPPac programme[19], which strengthens weather-related traditional knowledge for early warning use, can enrich Samoa's warning protocols by integrating them with scientific systems. Research capacity could also be strengthened by consolidating hazard studies into a centralized

[19]https://www.sprep.org/news/cosppac-traditional-knowledge-database-strengthening-weather-forecasting-and-observations-in-the-pacific

repository, as the *UNDRR 2022* Status Report points out. Building national research skills through scholarships, fellowships, and participatory research would ensure continuity and retention of expertise. *The Samoa National Adaptation Programme of Action (NAPA, 2010)* already identified the need for stronger research capacity and integration of traditional knowledge, providing a clear pathway forward.

3.1.2. Closing The Gaps:

Closing the gaps under **Pillar 1: Disaster Risk Knowledge** requires building a unified, interoperable system that consolidates hazard and risk data across agencies. Establishing a national multi-hazard data platform, upgrading ICT infrastructure, and digitizing hazard maps will ensure that information is reliable, accessible, and continuously updated. Equally important is embedding inclusivity by translating maps and materials into formats that reach vulnerable groups, including braille, bilingual, pictorial, and disability-friendly versions. These steps will transform fragmented datasets into a trusted knowledge base that supports evidence-based decision-making.

Strengthening monitoring, evaluation, and reporting frameworks will institutionalize accountability and learning, while upgrading statistical systems will improve sex and age disaggregated data collection. At the same time, documenting indigenous forecasting methods, integrating traditional knowledge into warnings, and expanding applied research capacity will enrich scientific data with community wisdom. Scholarships, training, and participatory research will build national expertise and ensure continuity. Together, these measures will close the gaps by creating a resilient, inclusive, and well resourced knowledge system that empowers both policymakers and communities to anticipate and respond effectively to disasters.

3.1.3. Pillar 1 Roadmap: Outcomes, Outputs And Activities

Intermediate Outcome 1.1 – Integrated National Multi-Hazard Data Platform The first outcome addresses fragmented hazard and risk data systems by creating a centralized, interoperable platform. Key outputs include an operational national multi-hazard data platform, upgraded ICT infrastructure with trained personnel, updated and digitized hazard maps, and inclusive dissemination formats. In the short term (1–2 years), Samoa will design the platform, draft and sign MoUs, upgrade ICT systems, test interoperability, commission hazard studies, and conduct participatory mapping workshops. In the medium term (3–5 years), activities will focus on digitizing datasets and maps in GIS, delivering training curricula and refresher courses, and rolling out awareness campaigns to promote inclusive formats. By the long term (5+ years), maintenance protocols will be institutionalized, workforce skills monitored, revision policies embedded for hazard maps, and inclusive dissemination formats refreshed regularly.

Pacific Example: The SPC ocean buoy project in Apia Harbour (2022) consolidated fragmented ocean hazard data into a real-time monitoring system tailored for local use. Fiji's GIS based hazard mapping under the Pacific Resilience Partnership (2019–2020) also demonstrated how digitization and interoperability can transform hazard data into actionable planning tools.

Estimated investment: USD 2.1 million.

Intermediate Outcome 1.2 – Strengthened Monitoring, Evaluation & Inclusive Data This outcome strengthens Samoa's monitoring and evaluation capacity and ensures inclusive data collection. Key outputs include a national DRR M&E framework with dashboards, annual DRR review reports, upgraded statistical systems capable of producing sex, age, and disability disaggregated (SADD) data, and inclusive data collection capacity. In the short term, Samoa will draft the M&E framework, secure cabinet approval, collect baseline data, and upgrade statistical software and databases. In the medium term, dashboards will be launched, staff trained, pilot assessments conducted, and annual DRR review reports published with workshops to track recommendations. In the long term, the framework will be institutionalized with regular updates, annual reporting cycles, and sustained monitoring of inclusive data practices.

Pacific Example: The Pacific Data Hub (SPC, 2020) provides a regional model for dashboards and inclusive statistics, enabling countries to collect and share SADD data. In Fiji, community level DRR projects (2024) piloted participatory data collection and reporting, showing how training enumerators and engaging NGOs and schools can strengthen inclu-

Estimated investment: USD 4.5 million.

Intermediate Outcome 1.3 – Integration of Traditional Knowledge & Research The third outcome focuses on documenting and integrating indigenous knowledge with scientific research. Key outputs include documented indigenous forecasting methods, hybrid warning templates that blend science and tradition, an applied research repository, and strengthened national research capacity through scholarships and participatory research. In the short term, oral histories will be collected, bilingual documentation published, awareness materials developed, scholarships rolled out, and hazard research commissioned. In the medium term, validation workshops will be held, hybrid warning templates revised and tested, repositories designed and digitized, and participatory research programs implemented. In the long term, hybrid protocols will be institutionalized, simulation exercises conducted, repositories maintained, and indigenous methods embedded into national research outputs.

Pacific Example: The Solomon Islands case study (AUT, 2022) documented how communities validated indigenous cyclone forecasting methods and integrated them into hybrid warning systems. Likewise, the Pacific Red Cross initiatives in Vanuatu and Fiji successfully embedded traditional knowledge into preparedness activities, improving trust and uptake of warnings.

Estimated investment: USD 5.5 million.

Overall Pillar 1 Investment The total estimated cost for implementing Pillar 1 is approximately **USD 17 million**. These investments will deliver a centralized hazard data platform, modern ICT systems, updated and inclusive hazard maps, strengthened monitoring and evaluation frameworks, and institutionalized integration of traditional knowledge with scientific research. By drawing on similar case studies such as Samoa's ocean buoy system, the Pacific Data Hub, and indigenous knowledge integration in Solomon Islands and Vanuatu, Samoa can adapt proven approaches to ensure its disaster risk knowledge system is scientifically rigorous, culturally grounded, and socially inclusive across short, medium, and long term horizons.

3.1.4. Pillar 1: Costed Implementation Plan

Table 1 PILLAR 1: Coasted Implementation Plan

Workplan Matrix – Pillar 1: Disaster Risk Knowledge								
Pillar 1: Inclusive hazard data blending science and tradition.								
Intermediate Outcome 1.1 – Integrated National Multi-Hazard Data Platform								
Gap	**Output**	**Priority Activities**	**Responsibility**	**Short Term (1–2 yrs)**	**Medium Term (3–5 yrs)**	**Long Term (5+ yrs)**	**Est. Cost (USD)**	**Budget Source**
1.1.1 Fragmented hazard/risk data systems	National Multi-Hazard Data Platform operational	Design & launch platform Digitize datasets & user interface Draft & sign MoUs Conduct workshops Establish maintenance protocols & awareness campaigns	MNRE DMO, MCIT	Platform design & MoUs	Workshops & digitization	Maintenance protocols & awareness campaigns	2,100,000	World Bank PREP, SPC, UNESCAP, GCF
1.1.2 ICT gaps	Interoperable ICT Infrastructure & skilled workforce	Upgrade ICT systems Test interoperability Develop curricula Train focal points Monitor skills application	MCIT , MNRE-DMO, Met, NUS	ICT upgrades & contracts	Training curricula & refresher courses	Skills monitoring & integration	1,500,000	ITU, ADB Digital Pacific, SPC ICT Division
1.1.3 Outdated hazard maps	Updated, digitized, institutionalized maps	Commission studies Participatory mapping workshops Digitize maps in GIS Train planners & communities Draft revision policy & secure budget	MNRE- DMO, MLS, SBS, SRCS	Studies & mapping workshops	GIS digitization & training	Revision policy & institutionalization	2,000,000	SPC GEM, UNDP, Kiwa, DFAT
1.1.4 Limited inclusivity	Inclusive dissemination of maps	Translate maps (braille, bilingual, pictorial) Partner with NGOs, schools, disability councils Awareness campaigns Refresh inclusive formats	MNRE- DMO, MWCSD, SUNGO, MEC, NOLA	Translation & partnerships	Awareness campaigns	Regular refresh cycles	1,400,000	UNICEF, UN Women, Kiwa, Disability Councils
						Subtotal	**7,000,000**	

3.1.4. Pillar 1: Costed Implementation Plan

Intermediate Outcome 1.2 – Strengthened Monitoring, Evaluation & Inclusive Data								
Gap	**Output**	**Priority Activities**	**Responsibility**	**Short Term**	**Medium Term**	**Long Term**	**Est. Cost (USD)**	**Budget Source**
1.2.1 Limited DRR M&E	Strengthened National M&E framework with dashboards	Draft framework & consultations Cabinet approval Training & compliance monitoring Launch dashboards Integrate datasets & update protocols	MNRE- DMO,	Draft framework & approval	Dashboard launch & training	Maintenance & updates	1,200,000	Gov + donors
1.2.2 Inadequate reporting	Annual DRR review reports	Collect data Draft & publish reports Track recommendations Develop training curricula Conduct workshops	MNRE DMO	Data collection & first report	Training & workshops	Institutionalized annual cycle	900,000	Gov + UNDP
1.2.3 Limited SADD data	Upgraded statistics system	Upgrade software/ databases Develop guidelines & MoUs Train staff Revise templates & pilot assessments Validate with communities	MNRE- DMO, SBS	Software upgrade & MoUs	Training & pilots	Institutionalized revision cycle	1,700,000	SPC, UNESCAP
1.2.4 Inclusivity gaps	Inclusive data collection capacity	Develop curriculum National workshops Train enumerators Awareness materials Partner with NGOs/ churches/schools	MNRE DMO, SBS, MWCSD, SUNGO, NOLA	Curriculum & workshops	Enumerator training & campaigns	Monitoring & uptake	700,000	UNICEF, UN Women
						Subtotal	**4,500,000**	

3.1.4. Pillar 1: Costed Implementation Plan

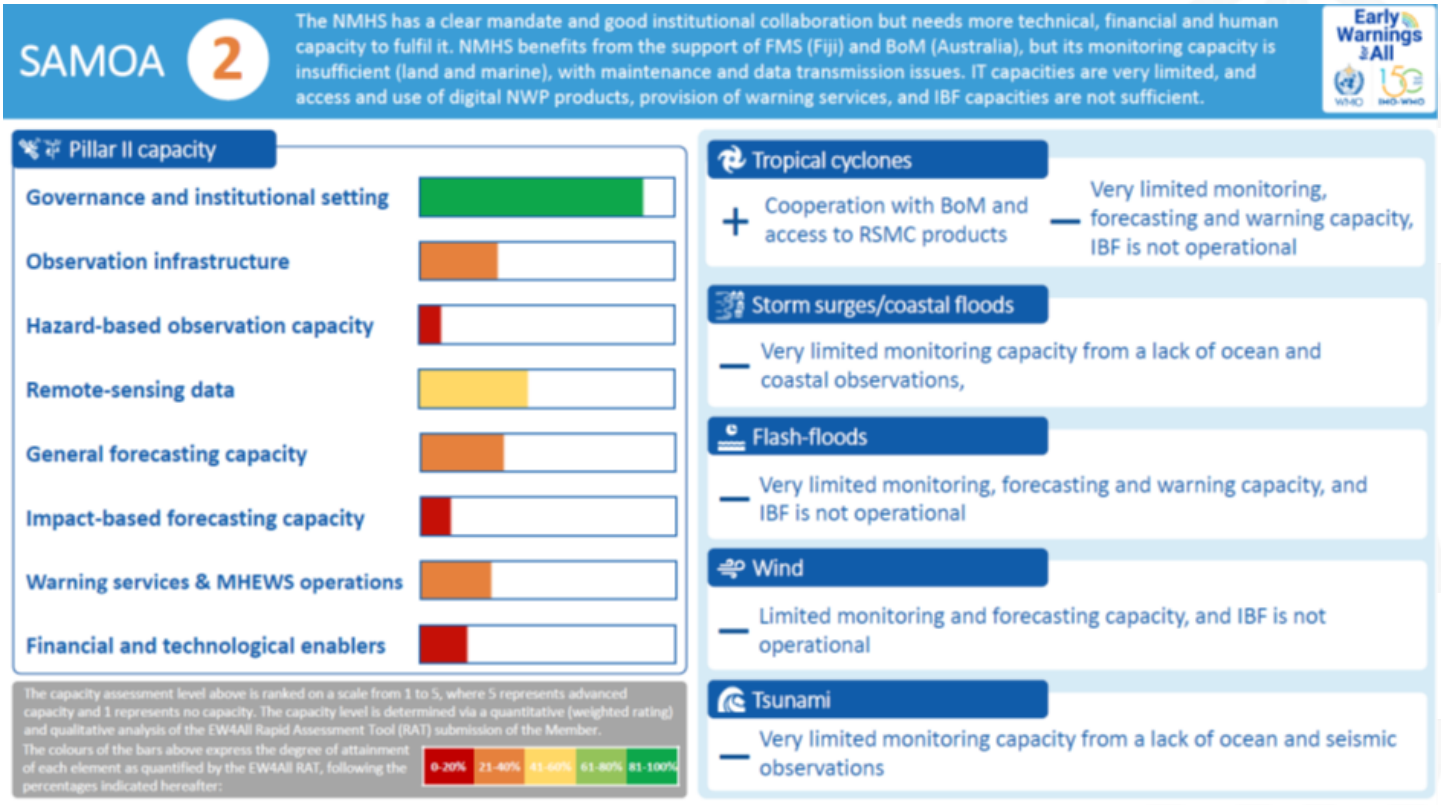
Intermediate Outcome 1.3 – Integration of Traditional Knowledge & Research								
Gap	**Output**	**Priority Activities**	**Responsibility**	**Short Term**	**Medium Term**	**Long Term**	**Est. Cost (USD)**	**Budget Source**
1.3.1 Limited traditional knowledge	Indigenous forecasting documented	Collect oral histories Publish bilingual documentation Community workshops Validate protocols & Cabinet endorsement	MNRE DMO, MWCSD, Communities	Oral histories & documentation	Workshops & validation	Institutionalized hybrid protocols	1,300,000	Kiwa, SPC
1.3.2 Limited integration	Traditional knowledge in warnings	Awareness materials Partner with NGOs/ churches Revise templates Train officers Test hybrid messages	MNRE DMO, MWCSD, Communities	Awareness materials & partnerships	Template revision & training	Simulation exercises	1,000,000	UN Women, SPC
1.3.3 Limited research capacity	Applied research repository	Commission hazard research Publish findings Build repository Digitize existing research Train users	MNRE DMO, SBS, NUS, USP	Commission studies	Repository design & training	Institutionalized repository	1,600,000	World Bank, SPC
1.3.4 Limited research skills	Strengthened research capacity	Scholarships/fellowships Training workshops Participatory research Document indigenous methods Publish hybrid outputs	MNRE DMO, SBS, NUS, USP	Scholarships & workshops	Participatory research	Hybrid outputs institutionalized	1,600,000	UNDP, Kiwa
						Subtotal	**5,500,000**	
						TOTAL	**17,000,000**	

3.2. PILLAR 2: DETECTION, OBSERVATION, MONITORING, ANALYSIS AND FORECASTING

3.2.1. Gaps Identification

Samoa's hazard monitoring systems have made important strides, yet there are clear opportunities to strengthen infrastructure and reliability. Observation networks could be expanded further, as rain gauges, sea level sensors, water level stations, gauges and road monitoring systems are not yet evenly distributed across the country. The *National Action Plan for DRM 2017–2021* notes that monitoring stations are sparse and coverage uneven, which presents a chance to broaden reach and ensure all decision-makers and communities benefit from timely data. Maintenance and calibration processes can also be enhanced, while real-time telemetry capacity offers room for growth. This was illustrated through the installation of ocean observation buoys in Apia Harbour, deployed to strengthen Samoa's early warning capability under the World Bank-funded Pacific Resilience Programme (SPREP), implemented by the Pacific Community (SPC)[20]. The activity highlights both the value of external support and the potential for Samoa to build a more robust national system. Standards and quality assurance mechanisms are emerging but could be further institutionalized to ensure consistency across outputs.

Figure 2 Pillar 2 Rapid assessment results.



Developing workforce capacity is another promising area. Samoa has a dedicated pool of professionals, but the *GFDRR Enhancing Multi-Hazard Early Warning Systems Project (2024)* highlighted that advanced training opportunities and retention strategies remain limited.

[20] https://www.spc.int/updates/blog/2022/10/strengthening-multi-hazard-early-warning-systems-in-samoa

At the regional level, efforts under the Weather Ready Pacific (WRP) programme and partners are advancing the establishment of a World Meteorological Organization (WMO)-accredited Regional Training Centre and Regional Instruments Centre in Fiji, with support from stakeholders including WRP, SPREP and development partners, to provide accredited hydrometeorological training, strengthen technical competencies, and support ongoing professional development across Pacific Island nations[21]. Expanding scholarships, continuous professional development, and career pathways would help sustain expertise and ensure upgraded systems are operated and maintained effectively over time.

Institutional and community dimensions also present opportunities for improvement. Data sharing across agencies is still fragmented, with repositories scattered and coordination mechanisms not fully embedded. The *National Action Plan for DRM (2017–2021)* acknowledges this, pointing to the need for stronger interoperability and streamlined repositories. Forecasts, while technically sound, are often complex and could be translated more consistently into accessible formats such as infographics, radio scripts, or inclusive communication materials. The *UNDRR Pacific Status Report (2022)* confirms that forecasts are not always tailored to community needs, suggesting an opportunity to strengthen trust and uptake through clearer, community friendly communication.

3.2.2. Closing the Gaps

Closing the gaps in **Pillar 2: Detection, Observation, Monitoring, Analysis and Forecasting** requires a comprehensive strengthening of Samoa's hazard monitoring systems. Expanding observation infrastructure is a priority, with additional rain gauges, sea-level sensors, water level stations gauges, and road monitoring systems deployed to underserved areas. Alongside this, investment in real-time telemetry, stress monitoring for critical infrastructure, and standardized sensor protocols will ensure that hazard data is both timely and reliable. Establishing robust maintenance systems, including calibration schedules, spare parts supply chains, and quality assurance audits, will help sustain these investments and build confidence in the accuracy of monitoring outputs.

Equally important is addressing workforce capacity. Developing curricula, expanding scholarships, and formalizing partnerships with universities and regional institutions will create a pipeline of skilled professionals. Continuous professional development programs, retention incentives, and a national roster of experts will ensure that Samoa has the technical staff needed to operate, maintain, and innovate within its monitoring systems. By embedding training and career pathways, the country can reduce reliance on external expertise and strengthen long-term resilience.

Finally, institutional and community dimensions must be reinforced. Establishing clear inter-agency data sharing protocols, centralizing repositories, and institutionalizing coordination workshops will improve collaboration and reduce fragmentation. Forecasts should be simplified and translated into accessible formats such as infographics, radio scripts, and inclusive communication materials to reach all communities.

[21] https://www.sprep.org/news/weather-ready-pacific-holds-talks-to-advance-agenda-for-a-regional-hydro-meteorological-training-centre-rtc-for-the-pacific

Training local committees, piloting feedback mechanisms, and refreshing materials regularly will build trust and ensure that forecasts are actionable. Together, these measures will close the gaps by creating a trusted, resilient, and inclusive hazard detection and forecasting system that empowers communities to act decisively when hazards arise.

3.2.3. Pillar 2 Roadmap: Outcomes, Outputs and Activities

Intermediate Outcome 2.1 – Reliable National Observation System This outcome prioritizes strengthening Samoa's hazard monitoring infrastructure. Key outputs include expanded rain gauges and sea level sensors, real-time telemetry systems, water level monitoring stations, road and infrastructure stress sensors, and national standards for calibration and quality assurance. In this context, the World Bank–supported PREPARE Samoa Project will play a major enabling role through investments in the procurement and installation of water level stations, rain gauges, automatic weather stations, ocean buoys, and seismic monitoring stations, directly contributing to this pillar.

In the short term (1–2 years), efforts will focus on procuring and installing sensors, mapping flood prone rivers, and drafting calibration protocols. In the medium term (3–5 years), actions will expand coverage to underserved areas, train technicians, and integrate telemetry into monitoring centers. By the long term (5+ years), Samoa will institutionalize maintenance protocols, replenish inventories, conduct annual audits, and embed monitoring outputs into resilience planning.

Pacific Example: The Pacific Sea Level and Geodetic Monitoring Project (PSLGM), operating since 1991 across 14 Pacific Island Countries including Samoa, installed sea level gauges and geodetic stations with real time telemetry. This project demonstrates how regional investment can expand observation networks, institutionalize calibration standards, and embed outputs into resilience planning.

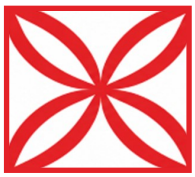
Estimated investment: USD 20 million.

Intermediate Outcome 2.2 – Skilled Workforce This outcome addresses workforce shortages and weak retention of technical expertise. Key outputs include capacity-building programs, scholarships and partnerships, and a national roster of experts. In the short term, priorities involve curriculum design, scholarship rollout, and CPD program development. In the medium term, actions will deliver workshops, formalize partnerships, and establish incentive schemes. In the long term, Samoa will institutionalize training modules, reintegrate graduates, and maintain expert rosters.

Pacific Example: Under the Framework for Resilient Development in the Pacific (FRDP, 2017–2030) and SPC's Disaster & Community Resilience Programme, countries such as Fiji and Vanuatu have implemented technical training, scholarships, and partnerships to build national rosters of experts. These initiatives show how structured curricula and incentive schemes can sustain technical expertise.

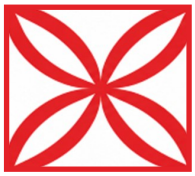
Estimated investment: USD 2 million.

Intermediate Outcome 2.3 – Seamless Data Sharing This outcome focuses on improving inter-agency coordination and data accessibility. Key outputs include formalized data sharing protocols, a centralized repository, and regular coordination workshops. In the short term, Samoa will draft MoUs, design repositories, and roll out workshops. In the medium term, priorities will adopt protocols, train staff, and establish access procedures. In the long term, annual monitoring, repository maintenance, and quarterly coordination cycles will be institutionalized to ensure consistent collaboration.



Pacific Example: The SPC Mapping of Disaster Risk Management Legislation, Policy, and Organisational Responsibility (2024) created a centralized repository of DRM frameworks across the Pacific. This initiative formalized data sharing protocols, improved inter-agency coordination, and provided accessible repositories for governments and communities.

Intermediate Outcome 2.4 – Impact Based Forecasts The final outcome ensures forecasts are clear, actionable, and community centered. Key outputs include impact based forecasting protocols, development of thresholds and triggers for activation, community friendly materials such as infographics and radio scripts, and trained local committees. In the short term, priorities involve drafting protocols, designing materials, and training community leaders. In the medium term, actions will integrate protocols into systems, disseminate materials widely, and pilot feedback mechanisms. In the long term, Samoa will institutionalize impact based forecasts, refresh materials annually, and sustain community feedback loops.



Pacific Example: In 2023, impact based forecasting became operational in Samoa and Tonga, supported by SPC and WMO. Their National Meteorological Services now forecast hazard events and predict impact scenarios for coastal flooding, cyclones, swell waves, rainfall, and tsunamis. Training workshops in Fiji equipped Samoa's meteorological staff with hands on operational experience, ensuring forecasts are actionable and community centered.

Estimated investment: USD 2 million.

Overall Pillar 2 Investment The total estimated cost for implementing Pillar 2 is approximately **USD 25.5 million** over the next decade. These investments will modernize Samoa's hazard detection infrastructure, build and retain a skilled workforce, institutionalize seamless data sharing, and deliver impact based forecasts that empower communities with trusted, actionable information. By drawing on similar Pacific case studies such as the Pacific Sea Level and Geodetic Monitoring Project (PSLGM), FRDP workforce programs, SPC's DRM repository, and operational impact based forecasting in Samoa and Tonga, Samoa can adapt proven approaches to strengthen its national systems.

3.2.4. Pillar 2: Costed Implementation Plan

Table 2 PILLAR 2: Coasted Implementation Plan

Workplan Matrix – Pillar 2: Detection, Observatory, Forecasts & Monitoring								
Pillar 2: Trusted hazard detection, monitoring, and clear forecasts.								
Intermediate Outcome 2.1 – Reliable National Observation System								
Gap Identified	**Associated Outputs**	**Activities**	**Responsible Agencies**	**Short Term (1–2 yrs)**	**Medium Term (3–5 yrs)**	**Long Term (5+ yrs)**	**Est. Cost (USD)**	**Potential Financing**
2.1.1 Inadequate observation infrastructure	Expanded rain gauges & sea-level sensors	Procure & install stations Integrate into national network	MNRE- MET	Procurement & installation	Expansion to under-served areas	Maintenance & upgrades	4,500,000	World Bank PREP II, SPC GEM, WMO CREWS
2.1.2 Poor maintenance capacity	Maintenance protocols & supply chains	Develop calibration protocols Train technicians Establish service contracts Create spare parts inventory	MNRE- MET	Protocol design	Training & contracts	Inventory replenishment	3,000,000	ADB Pacific Resilience, SPC ICT
2.1.3 Weak telemetry	Real time telemetry systems	Procure telemetry equipment Integrate into monitoring centers Conduct quarterly tests	MNRE- MET	Equipment procurement	Integration & testing	Annual refinement	3,000,000	UNESCAP Digital Resilience, ITU
2.1.4 Flood monitoring gaps	Flood stations installed	Map flood-prone rivers Install hydrological stations Train technicians Integrate sensor data	MNRE- MET & WRD	Mapping & procurement	Installation & training	Integration & maintenance	3,500,000	Kiwa Initiative, DFAT Climate Resilience

3.2.4. Pillar 2: Costed Implementation Plan

Table 2 PILLAR 2: Coasted Implementation Plan

Workplan Matrix – Pillar 2: Detection, Observatory, Forecasts & Monitoring								
Gap Identified	**Associated Outputs**	**Activities**	**Responsible Agencies**	**Short Term (1–2 yrs)**	**Medium Term (3–5 yrs)**	**Long Term (5+ yrs)**	**Est. Cost (USD)**	**Potential Financing**
2.1.5 Road hotspot risks	Road monitoring systems	Identify accident-prone segments Deploy cameras/ sensors Train engineers Integrate into transport planning	LTA, MWTI	Hotspot mapping	Deployment & training	Integration into planning	2,000,000	WB Transport Safety, ADB Pacific Transport
2.1.6 Infrastructure stress	Stress monitoring systems	Select priority bridges/buildings Install strain/vibration sensors Train engineers Integrate outputs	MWTI, MNRE	Site selection	Installation & training	Integration into resilience systems	2,000,000	WB Infrastructure Resilience, JICA
2.1.7 Non-standard sensors	National standards adopted	Develop standards with WMO Draft calibration guidelines Secure Cabinet approval	MNRE MET, WMO	Drafting	Approval	Institutionalization	1,000,000	WMO CREWS, SPC
2.1.8 Weak calibration	Calibration schedules	Train technicians Establish calibration schedules Maintain records	MNRE MET, WRD	Training	Implementation	Sustained records	500,000	ITU , SPC ICT

3.2.4. Pillar 2: Costed Implementation Plan

Workplan Matrix – Pillar 2: Detection, Observatory, Forecasts & Monitoring								
Gap Identified	**Associated Outputs**	**Activities**	**Responsible Agencies**	**Short Term (1–2 yrs)**	**Medium Term (3–5 yrs)**	**Long Term (5+ yrs)**	**Est. Cost (USD)**	**Potential Financing**
2.1.9 QA gaps	QA system established	Conduct annual audits Establish QA protocols Partner with regional labs	MNRE MET, WMO	Protocol design	Annual audits	Regional partnerships	500,000	SPC GEM, WMO CREWS
						Subtotal	**20,000,000**	
Intermediate Outcome 2.2 – Skilled Workforce								
Gap Identified	**Associated Outputs**	**Activities**	**Responsible Agencies**	**Short Term**	**Medium Term**	**Long Term**	**Est. Cost (USD)**	**Potential Financing**
2.2.1 Workforce shortages	Capacity-building programs	Develop curricula (including Post Disaster Needs Assessment (PDNA) courses) Deliver workshops Integrate modules into NUS/USP	MNRE MET, CORPORATE, NUS, USP, WMO	Curriculum design	Workshops & integration	Institutionalization	600,000	USP, NUS, SPC GEM
2.2.2 Limited advanced training	Scholarships & partnerships	Provide scholarships Formalize partnerships Track retention	PSC, MNRE, MOF, NUS, USP	Scholarship rollout	Partnerships formalized	Graduate reintegration	800,000	DFAT Scholarships, NZ MFAT
2.2.3 Weak retention	National roster of experts	Establish CPD programs Create retention incentives Maintain roster database	MNRE, PSC, MOF	CPD design	Incentive schemes	Roster maintenance	600,000	UNDP Capacity Building, WB PREP II
							Subtotal	**2,000,000**

3.2.4. Pillar 2: Costed Implementation Plan

Table 2 PILLAR 2: Coasted Implementation Plan

Workplan Matrix – Pillar 2: Detection, Observatory, Forecasts & Monitoring								
Pillar 2: Trusted hazard detection, monitoring, and clear forecasts.								
Intermediate Outcome 2.3 – Seamless Data Sharing								
Gap Identified	**Associated Outputs**	**Activities**	**Responsible Agencies**	**Short Term**	**Medium Term**	**Long Term**	**Est. Cost (USD)**	**Potential Financing**
2.3.1 Weak inter-agency sharing	Data sharing protocols	Develop MoUs Formalize protocols Monitor annually	MNRE MET, DMO, SBS	Draft MoUs	Protocol adoption	Annual monitoring	500,000	UNESCAP Digital Resil-ience
2.3.2 Fragmented repositories	Centralized repository	Establish repository Develop access protocols Maintain updates	, MNRE MET, DMO, SBS, MCIT	Repository design	Protocols & training	Maintenance	500,000	SPC ICT, ITU
2.3.3 Poor coordination	Regular meetings	Conduct quarterly workshops Train staff Disseminate outcomes	MNRE MET, WRD, DMO	Workshop rollout	Training & integra-tion	Institutional-ized cycle	500,000	UNDP Gov-ernance, SPC GEM
						Subtotal	**1,500,000**	
Intermediate Outcome 2.4 – Impact-Based Forecasts								
Gap Identified	**Associated Outputs**	**Activities**	**Responsible Agencies**	**Short Term**	**Medium Term**	**Long Term**	**Est. Cost (USD)**	**Potential Financing**
2.4.1 Complex fore-casts	Impact-based protocols	Translate forecasts Develop protocols Integrate into systems	MNRE- MET, DMO,WMO	Protocol drafting	Integra-tion	Institutionali-zation	700,000	WMO CREWS, SPC GEM
2.4.2 Poor accessibility	Community friendly materials	Develop infographics, radio scripts Disseminate via media Update annually	MNRE- MET, DMO,WMO, MWCSD, COM-MUNITIES, SRCS	Material de-sign	Dissemi-nation	Annual refresh	650,000	UNICEF, UN Women

3.2.4. Pillar 2: Costed Implementation Plan

Table 2 PILLAR 2: Coasted Implementation Plan

Workplan Matrix – Pillar 2: Detection, Observatory, Forecasts & Monitoring								
Pillar 2: Trusted hazard detection, monitoring, and clear forecasts.								
Intermediate Outcome 2.4 – Impact-Based Forecasts								
Gap Identified	**Associated Outputs**	**Activities**	**Responsible Agencies**	**Short Term**	**Medium Term**	**Long Term**	**Est. Cost (USD)**	**Potential Financing**
2.4.3 Weak community uptake	Local committees trained	Train leaders Pilot feedback Conduct refresher training	MNRE- MET, DMO,WMO, MWCSD, COM-MUNITIES, SRCS	Initial training	Feedback pilots	Annual refreshers	650,000	Kiwa Initia-tive, SUNGO
						Subtotal	**2,000,000**	
						TOTAL	**25,500,000**	

3.3. PILLAR 3: WARNING DISSEMINATION AND COMMUNICATION

3.3.1. Gaps Identification

Samoa's warning dissemination system has made important progress, but there are clear opportunities to expand its reach and reliability. For example, tsunami sirens were installed in Apia on the island of Upolu in 2014, yet some of the rural and outer island communities remain less well covered especially in Savaii. Extending siren and broadcast infrastructure to these areas would ensure more equitable access to timely alerts (RedR – The Emergency Sirens of Samoa). Similarly, the Pacific Community's deployment of ocean buoys in Apia Harbour in 2022 shows how external support has helped fill monitoring gaps, while also pointing to the value of building a more robust national telemetry system (SPC – Strengthening Multi-Hazard Early Warning Systems in Samoa). Building on this, the World Bank's Pacific Region Preparedness, Adaptation and Resilience (PREPARE) Project is investing in hazard monitoring, communication, and early warning equipment to improve Samoa's capacity to monitor natural hazards and deliver reliable alerts, underscoring the importance of a more robust national telemetry system and expanded observational coverage. (World Bank PREPARE Project Appraisal; Samoa PREPARE ESMF).[22]

There is also scope to make warning content more inclusive. Current communication practices do not consistently provide accessible formats such as braille, sign language, or pictorial guides, which can limit uptake among persons with disabilities or non-literate groups. The IFRC has noted that stronger integration of protection, gender, and inclusion into disaster law and practice would help ensure warnings reach everyone effectively (IFRC – Strengthening Protection, Gender and Inclusion in Disaster Law: Samoa).

On the institutional side, Samoa has developed protocols for emergency telecommunications, but these remain fragmented and could benefit from harmonization. The National Emergency Telecommunication Operational Plan (NETOP, 2019) identified opportunities to clarify roles, digitize SOPs, and strengthen integration of telecom operators into drills. It also highlighted the importance of streamlining customs clearance for emergency equipment to avoid delays during crises (Office of the Regulator – Samoa NETOP 2019). GFDRR's 2024 project fiche reinforces this, noting that Samoa's early warning systems would be strengthened by more consistent coordination and integration of mobile alerts (GFDRR – Enhancing Multi-Hazard Early Warning Systems in Samoa).

Finally, there is room to build stronger feedback loops with communities. The National Disaster Management Plan 2017–2020 acknowledged that while sirens and coastal infrastructure plans were in place, systematic after action reviews and community feedback mechanisms were not yet embedded (Samoa National Disaster Management Plan 2017–2020). The Ministry of Natural Resources and Environment has also noted that awareness campaigns and committee training are sporadic, suggesting an opportunity to institutionalize regular engagement and trust-building (MNRE – Disaster Management Office).

[22] https://documents1.worldbank.org/curated/en/099063025140037242/pdf/P507749-024e23d5-571e-4054-9a29-3c43974e8f75.pdf

3.3.2. Closing the Gaps

Samoa's warning dissemination system is already functional, but there are exciting opportunities to expand its reach and inclusivity. Coverage in rural and outer islands can be broadened through new sirens, loudspeakers, and through enhanced digital channels such as the ongoing mobile cell broadcast project led by the Disaster Management Office (DMO), which aims to strengthen delivery of early warning messages across all mobile devices.[23] [24] Pilot projects for community-based networks can be scaled nationally, building strong local ownership and last-mile connectivity. Cell broadcast systems provide a major advantage by delivering emergency alerts instantly to all mobile devices in a targeted area without being affected by network congestion, thereby eliminating challenges faced in SMS-based warning dissemination. Investments in radio service upgrades and, introduction of the cell broadcast system will create a truly effective multichannel system, while inclusive templates—designed in multiple languages and formats such as braille, sign language, and pictorial guides—will make warnings accessible to all groups. Together, these steps will transform coverage gaps into a robust, community centered warning system.

The implementation of the Common Alerting Protocol (CAP) standardizes the format for emergency alerts, enabling seamless interoperability across different dissemination platforms and technologies. CAP ensures that warnings can be disseminated simultaneously through multiple channels, such as Cell Broadcast, SMS, radio, television, social media, and sirens, reducing delays and maximizing reach. This harmonization not only improves efficiency and accuracy in warning communication but also supports multilingual and multi-hazard alerts, making EWSs more inclusive and effective.

On the institutional side, Samoa has the chance to modernize its regulatory frameworks and telecom integration. Developing a national communication protocol for mobile alerts will harmonize SOPs and clarify roles, while formalized partnerships with telecom operators will ensure emergency messaging is reliable and interoperable. Customs agreements and accession to the Tampere Convention will streamline the import of emergency equipment and align Samoa with international best practice. Revitalizing the emergency telecom sector through updated membership, coordination meetings, and integration into disaster exercises will strengthen readiness and ensure operators are active partners in resilience.

Continuous improvement is another area of opportunity. Reviewing and harmonizing SOPs, digitizing protocols, and embedding them into the national multi-hazard platform will modernize communication practices. Establishing a post event evaluation framework will institutionalize after-action reviews and feedback loops, ensuring lessons learned are captured and acted upon. Annual reporting cycles and refresher workshops will embed a culture of continuous improvement across agencies.

[23] https://www.facebook.com/DMOSamoa/posts/mobile-cell-broadcast-project-for-samoa-29-october-2025the-mnre-disaster-managem/1217611273731503/
[24] https://www.sprep.org/news/sprep-supports-cook-islands-samoa-solomon-islands-and-kiribati-transformational-roll-out-of-cell-broadcasting-for-hazard-preparedness-and-response

Inclusivity and trust are central to closing the gaps. Developing inclusive warning templates, establishing a reliable mechanism to understand the most appropriate warning dissemination channel, and the availability of alternative channels to reach at-risk communities, and piloting them with communities will ensure messages are clear, actionable, and accessible to all. The Early Waning Connectivity Maps (EWCM) can help identify "cold spots", specific geographic areas where people do not have access to mobile network coverage (2G, 3G, 4G, 5G, and fixed broadband) and thus cannot receive automated early warning notifications through services like Cell Broadcast or SMS. Training officers and community leaders in inclusive communication will build capacity at the local level. Finally, establishing feedback mechanisms, updating the register of alerting authorities, and conducting awareness campaigns will strengthen community trust, creating a two-way flow of information that empowers people to act confidently when hazards arise.

3.3.3. Pillar 3 roadmap: Outcomes, Outputs, and Priority Actions

Intermediate Outcome 3.1 – Reliable Multi-Channel Early Warning Systems Samoa has the opportunity to expand the reach and reliability of its EWS by strengthening coverage in rural and outer islands. In the short term, this involves conducting coverage assessments, developing Early Warning Connectivity Maps (EWCM), and piloting the community-based networks. The Pacific Region Preparedness, Adaptation and Resilience Program (PREPARE) – Samoa project (World Bank) also includes design and procurement of early warning system equipment such as emergency sirens, integrating them with electrical and radio networks, operations and maintenance support, and related training. A targeted feasibility assessment of areas needing sirens—especially on Upolu, which historical tsunami hazard analyses identify as highly vulnerable due to its proximity to the Tonga Trench — would help prioritise investments and maximise risk-reduction effectiveness.[25] [26]

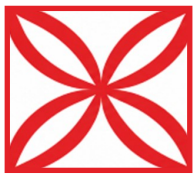
Medium-term priorities include installing sirens and loudspeakers, negotiating MoUs with telecom providers, scaling community networks, and implementing cell broadcast infrastructure. CAP-enabled warning messages ensure consistency across platforms, fostering trust, interoperability, and improved clarity for recipients. Over the long term, these systems will be maintained through regular test broadcasts, national rollout of community networks, and annual refresh of inclusive materials.

Pacific Example: Fiji expanded its siren network after Cyclone Winston (2016), ensuring rural and maritime communities were covered through UNDP's *"When the Sirens Sing"* project. Regionally, SPC's *Multi-Hazard Early Warning Systems Project (2021–2025)* supported 14 Pacific Island Countries, including Samoa, to strengthen institutional governance and community preparedness.

Estimated Budget: USD 10 million.

[25] https://www.mwti.gov.ws/wp-content/uploads/2025/06/250625-PREPARE-ESMF-Updated-Clean.pdf
[26] https://www.gfdrr.org/sites/default/files/GFDRR_Samoa_PDNA_2009_EN.pdf

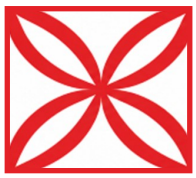
Intermediate Outcome 3.2 – Regulatory Frameworks & Telecom Integration Strengthening Samoa's regulatory frameworks will ensure that warning dissemination is consistent, coordinated, and supported by telecom operators. Short-term actions include reviewing and harmonizing SOPs in line with Samoa's National Emergency Telecommunications Operational Plan (NETOP), drafting customs agreements, initiating accession to the Tampere Convention, and signing MoUs with mobile operators. Medium term priorities focus on training staff, digitizing SOPs, conducting after action reviews, integrating operators into drills, and rolling out customs training. In the long term, Samoa will institutionalize communication protocols, embed evaluation cycles, monitor compliance, and fully integrate Tampere provisions into ICT systems. Revitalizing the emergency telecom sector through updated membership and regular coordination meetings will also be key.



Pacific Example: In 2025, the Solomon Islands launched a *Cell Broadcast Early Warning System* in Honiara, showcased by PITA, which delivers congestion free alerts to all mobile handsets—even without credit or SIM cards. Additionally, the *Telecommunications Emergency Readiness Masterplan (TERM, 2024)* developed for Fiji, PNG, Samoa, and Vanuatu provides a framework for integrating telecom operators into disaster protocols

Estimated Budget: USD 3.2 million

Intermediate Outcome 3.3 – Harmonized SOPs & Continuous Improvement Modernizing and harmonizing SOPs will provide Samoa with a clear, digitized, and continuously updated communication framework. In the short term, comprehensive SOP reviews and digitization will be undertaken, alongside the design of a post-event evaluation framework and annual reporting cycle. Medium term actions will focus on training and harmonization, integrating SOPs into the national multi channel dissemination platform, and embedding feedback from reviews. Over the long term, Samoa will institutionalize protocols, maintain annual updates, and embed continuous improvement through refresher workshops and lessons learned cycles.



Pacific Example: SPC's *Disaster & Community Resilience Programme (DCRP)* has supported Pacific countries in harmonizing DRM SOPs, embedding continuous improvement cycles, and operationalizing the *Framework for Resilient Development in the Pacific (FRDP)*.

Estimated Budget: USD 2.55 million

Intermediate Outcome 3.4 – Inclusive Warning Messages Ensuring warnings are accessible to all communities is a central priority. Short term actions include designing inclusive templates and training officers and leaders in inclusive communication. Medium term priorities involve producing and disseminating formats such as sign language alerts, braille guides, and pictorial versions, alongside piloting and monitoring their effectiveness. In the long term, Samoa will institutionalize inclusive messaging practices, refreshing templates annually and embedding them into national systems.

Pacific Example The *Pacific Disability Forum (2023)* piloted inclusive communication training in Samoa, producing sign language and pictorial messaging for disaster contexts. SPC's *Fostering an Inclusive Pacific (2024)* initiative further emphasized disability inclusion in disaster communication.

Estimated Budget: USD 1.5 million

Intermediate Outcome 3.5 – Community Participation & Trust Building trust and participation at the community level will ensure warnings are acted upon quickly and confidently. Short-term priorities include designing feedback mechanisms and rolling out awareness campaigns. Medium-term actions will focus on monitoring feedback and integrating improvements into communication practices. Over the long term, Samoa will institutionalize these mechanisms, embedding trust building and feedback loops into national disaster risk management systems.

Pacific Example: The *World Bank's Community Resilience Projects* in Vanuatu, Solomon Islands, and Kiribati piloted community driven DRM, embedding feedback loops and awareness campaigns. Similarly, the *Tonga Community Development Trust DRM Project*, funded by Australia, strengthened community participation and trust in warning systems.

Estimated Budget: USD 3 million

Overall Pillar 3 Investment The total estimated cost for Pillar 3 is **USD 20.25 million** over the next decade. By benchmarking against successful Pacific projects— Fiji's siren expansion, launching of the Solomon Islands' cell broadcast system, SPC's SOP harmonization, disability-inclusive communication pilots, and community trust initiatives—Samoa can modernize its warning dissemination systems with confidence, ensuring they are multi-channel, inclusive, and trusted by all communities.

3.3.4. Pillar 3: Costed Implementation Plan

Table 3 PILLAR 3: Coasted Implementation Plan

Workplan Matrix – Pillar 3: Warnings Dissemination & Communication								
Pillar 3: Resilient multi-channel warnings with inclusive communication								
Intermediate Outcome 3.1 – Reliable Multi-Channel Early Warning Systems								
Gap Identified	**Associated Outputs**	**Activities**	**Responsible Agencies**	**Short Term (1–2 yrs)**	**Medium Term (3–5 yrs)**	**Long Term (5+ yrs)**	**Est. Cost (USD)**	**Potential Financing**
3.1.1 Limited warning coverage in rural/outer islands	Expanded rural & outer island warning coverage	Conduct multi-channel coverage assessment Development of the Early Warning Connectivity Maps Train local operators	MNRE, MCIT, DMO, Telecom Operators, MWCSD	Coverage assessment & mapping	Siren Installation & telecom MoUs	Maintenance & test	2,000,000	WB PREP II, ITU , SPC GEM
3.1.2 Weak last mile dissemination at community level	Community-based networks piloted & scaled	Establish pilot community networks Train local institutions Monitor/evaluate pilots Integrate feedback Scale nationally	MCIT, MWCSD, MNRE, SUNGO, NGOs, Village Councils	Pilot networks	Feedback integration & scaling	National rollout	1,000,000	UNICEF, UN Women, Kiwa Initiative

3.3.4. Pillar 3: Costed Implementation Plan

Table 3 PILLAR 3: Coasted Implementation Plan

Workplan Matrix – Pillar 3: Warnings Dissemination & Communication								
Gap Identified	**Associated Outputs**	**Activities**	**Responsible Agencies**	**Short Term (1–2 yrs)**	**Medium Term (3–5 yrs)**	**Long Term (5+ yrs)**	**Est. Cost (USD)**	**Potential Financing**
3.1.3 Critical gaps in the availability of sirens, radio service coverage, and mobile-based warning dissemination	Multi-channel infrastructure operational	Procure/install sirens/ loudspeaker for all rural and urban areas.	MNRE DMO, MCIT, Telecom Operators,	Siren procurement & radio service upgrades and Cell Broadcast Implementation		Annual testing & maintenance	6,600,000	WB PREP II, ITU, Telecom Operators
		Upgrade radio infrastructure						
		Negotiate MoUs with mobile operators						
		Establish a National Policy on CB with its regulatory framework.						
		Develop technical ToRs for CB implementation						
		Pilot CB solution in collaboration with mobile network operators						
		Implementation of cell broadcast infrastructure						

3.3.4. Pillar 3: Costed Implementation Plan

Table 3 PILLAR 3: Coasted Implementation Plan

Workplan Matrix – Pillar 3: Warnings Dissemination & Communication								
Pillar 3: Resilient multi-channel warnings with inclusive communication								
Intermediate Outcome 3.1 – Reliable Multi-Channel Early Warning Systems								
Gap Identified	**Associated Outputs**	**Activities**	**Responsible Agencies**	**Short Term (1–2 yrs)**	**Medium Term (3–5 yrs)**	**Long Term (5+ yrs)**	**Est. Cost (USD)**	**Potential Financing**
3.1.4 Non-inclusive and inconsistent warning content	Inclusive warning content disseminated	Develop multilingual templates Adapt for disability inclusion (audio, braille, sign language, pictorial) Integrate templates into EW4All Disseminate via multiple channels Implement CAP across multiple dissemination channels	MWCSD, MNRE, MCIT, SUNGOs, Disability Councils, NOLA	Template design & CAP adoption	Integration & dissemination	Annual refresh	500,000	UNICEF, UN Women, ITU Disability Councils
						Subtotal	10,100,000	

3.3.4. Pillar 3: Costed Implementation Plan

Table 3 PILLAR 3: Coasted Implementation Plan

Workplan Matrix – Pillar 3: Warnings Dissemination & Communication								
Pillar 3: Resilient multi-channel warnings with inclusive communication								
Intermediate Outcome 3.2 – Regulatory Frameworks & Telecom Integration								
Gap Identified	**Associated Outputs**	**Activities**	**Responsible Agencies**	**Short Term**	**Medium Term**	**Long Term**	**Est. Cost (USD)**	**Potential Financing**
3.2.1 Strengthen capacity and awareness on mandates/ policies for mobile alerts	National Communication Protocol adopted	Review SOPs Harmonize into single protocol Define roles & escalation pathways Train staff via simulations Digitize SOPs	MNRE, MCIT, DMO, Police, Fire Services, MWCSD, PSC, Office of the Regulator	SOP review & harmonization	Training & digitiza-tion	Institu-tionalizati on	800,000	UNDP Govern-ance, WB PREP II
3.2.2 Lack of post-event evaluation	Post-Event Evaluation Framework operational	Establish framework & Indicators Conduct after-action reviews Integrate community feedback Publish annual reports Revise SOPs/templates	MNRE, MCIT, MWCSD, SUNGO, SFESA, Telecom Operators	Framework design	Reviews & reporting	Institu-tionalized cycle	600,000	UNICEF, UN Wom-en, SPC GEM
3.2.3 Strengthen Mobile operators integration	Formalized partnerships & protocols	Negotiate/sign MoUs Establish technical working group Adopt protocols for emergen-cy messaging	MNRE, DMO, MCIT, Digicel, Vodafone, Office of the Regulator	MoUs signed	Protocol adoption	Annual review	600,000	Telecom Opera-tors, ITU

3.3.4. Pillar 3: Costed Implementation Plan

Table 3 PILLAR 3: Coasted Implementation Plan

Workplan Matrix – Pillar 3: Warnings Dissemination & Communication								
Gap Identified	**Associated Outputs**	**Activities**	**Responsible Agencies**	**Short Term**	**Medium Term**	**Long Term**	**Est. Cost (USD)**	**Potential Financing**
3.2.4 Weak operator participation	Operators Integrated into simulations	Integrate operators into drills Test interoperability Document results Implement corrective actions	MNRE-DMO, MCIT, Digicel, Vodafone, PSC, Office of the Regulator	Initial integration	Testing & documenta-tion	Institutionali-zation	600,000	WB PREP II, Telecom Operators
3.2.5 No customs facilitation	Customs clearance institutional-ized	Draft customs agreement Train customs officers Conduct refresher trainings	Ministry of Customs (MCR), MNRE- DMO MCIT	Agreement drafted	Training rollout	Compliance monitoring	600,000	UN OCHA, WB PREP II
3.2.6 Not party to Tampere Convention	Accession & Integration	Initiate accession process Awareness sessions Integrate provisions into ICT protocols	MNRE, MCR, MCIT, MOF, MPMC, Par-liament, Office of the Regulator	Accession process	Awareness & integration	Institutionali-zation	200,000	ITU, UN OCHA

3.3.4. Pillar 3: Costed Implementation Plan

Table 3 PILLAR 3: Coasted Implementation Plan

Workplan Matrix – Pillar 3: Warnings Dissemination & Communication								
Gap Identified	**Associated Outputs**	**Activities**	**Responsible Agencies**	**Short Term**	**Medium Term**	**Long Term**	**Est. Cost (USD)**	**Potential Financing**
3.2.7 Inactive Emergency Telecom Sector	Sector restructured & institutionalized	Update membership Reactivate sector via quarterly meetings Develop action plan	MNRE-DMO, MCIT, Telecom Operators, UN Agencies, Office of the Regulator	Membership update	Coordination meetings	Institutional-ized sector	100,000	ITU, ETC, UNDP, WB PREP II
3.2.8 Weak sector readiness	Sector integrated into disaster exercises	Integrate sector into drills Test readiness Document & implement corrective actions Conduct refresher workshops	MNRE-DMO, MCIT, Telecom Operators	Initial integration	Testing & cor-rective actions	Institutionali-zation	200,000	WB PREP II, UNDP
						Subtotal	**3,700,000**	

3.3.4. Pillar 3: Costed Implementation Plan

Table 3 PILLAR 3: Coasted Implementation Plan

Workplan Matrix – Pillar 3: Warnings Dissemination & Communication								
Pillar 3: Resilient multi-channel warnings with inclusive communication								
Intermediate Outcome 3.3 – Harmonized SOPs & Continuous Improvement								
Gap Identified	**Associated Outputs**	**Activities**	**Responsible Agencies**	**Short Term**	**Medium Term**	**Long Term**	**Est. Cost (USD)**	**Potential Financing**
3.3.1 Outdated SOPs	National Communication Protocol institutionalized	Comprehensive SOP review Harmonize into single protocol Define roles & escalation Train staff via simulations	MNRE, MCIT, Police, Fire Services, MWCSD, PSC	SOP review	Training & harmonization	Institutionalization	1,000,000	UNDP Governance, WB PREP II
3.3.2 Fragmented SOPs	Digitized SOPs integrated	Digitize harmonized SOPs Integrate into multi-hazard platform Maintain/update annually	MCIT, MNRE-DMO, SBS	Digitization	Integration	Annual updates	550,000	SPC ICT, ITU
3.3.3 No post-event evaluation	Post-Event Evaluation Framework	Establish framework Conduct after-action reviews Integrate feedback Document findings	MNRE- DMO, MCIT, Telecom Operators	Framework design	Reviews & feedback	Institutionalization	600,000	UNICEF, UN Women

3.3.4. Pillar 3: Costed Implementation Plan

Table 3 PILLAR 3: Coasted Implementation Plan

Workplan Matrix – Pillar 3: Warnings Dissemination & Communication								
Gap Identified	**Associated Outputs**	**Activities**	**Responsible Agencies**	**Short Term**	**Medium Term**	**Long Term**	**Est. Cost (USD)**	**Potential Financing**
3.3.4 Weak continuous improvement	Continuous improvement institutionalized	Publish annual reports Revise SOPs/ templates Institutionalize lessons learned Conduct refresher workshops	MNRE- DMO, MCIT,	Reporting cycle	SOP revision	Institutionalization	400,000	WB PREP II, UNDP
						Subtotal	**2,550,000**	
Intermediate Outcome 3.4 – Inclusive Warning Messages								
Gap Identified	**Associated Outputs**	**Activities**	**Responsible Agencies**	**Short Term**	**Medium Term**	**Long Term**	**Est. Cost (USD)**	**Potential Financing**
3.4.1 Non-inclusive warnings	Inclusive templates developed	Develop inclusive templates Establish review committee Produce sign language alerts Develop braille guides Create pictorial versions	MNRE, MWCSD, SBS, SUNGO, Disability Councils, NOLA	Template design	Production & dissemination	Annual refresh	900,000	UNICEF, UN Women, Disability Councils

3.3.4. Pillar 3: Costed Implementation Plan

Table 3 PILLAR 3: Coasted Implementation Plan

Workplan Matrix – Pillar 3: Warnings Dissemination & Communication								
3.4.2 Weak inclusive practice	Capacity building & piloting	Train officers & leaders Pilot inclusive messaging Monitor effectiveness	MWCSD, MNRE, PSC, SUNGOs, Village Councils, NOLA	Training rollout	Piloting & monitoring	Institutionalization	600,000	Kiwa Initiative, UN Women
						Subtotal	**1,500,000**	
Intermediate Outcome 3.5 – Community Participation & Trust								
Gap Identified	**Associated Outputs**	**Activities**	**Responsible Agencies**	**Short Term**	**Medium Term**	**Long Term**	**Est. Cost (USD)**	**Potential Financing**
3.5.1 Weak community trust	Feedback & trust mechanisms	Establish feedback mechanisms Conduct awareness campaigns Monitor feedback & integrate improvements	MWCSD, MNRE- DMO, SUNGO, Village Councils, SRCS	Feedback design	Campaign rollout	Institutionalization	3,000,000	UNICEF, UNDP, Kiwa Initiative
						Subtotal	**3,000,000**	
						TOTAL	**20,850,000**	

3.4. PILLAR 4: (DISASTER) PREPAREDNESS AND RESPONSE CAPABILITIES

3.4.1. Gaps Identification

Samoa's disaster preparedness and response systems are built on a strong foundation, but several critical gaps remain that limit their effectiveness. At the preparedness level, hazard-specific contingency plans for cyclones, tsunamis, pandemics, and floods are outdated and not embedded in systematic revision cycles, as confirmed in the *National Disaster Management Plan 2017–2020*. Technical staff capacity is limited, with few opportunities for advanced training or retention, a challenge highlighted by the *GFDRR Enhancing Multi-Hazard Early Warning Systems Project (2024)*. Post-disaster learning is not consistently institutionalized; the *UNDRR Disaster Risk Reduction Status Report 2022* noted that after-action reviews and lessons learned mechanisms were sporadic and not embedded in national systems. Nationwide drills and simulations are also irregular, leaving communities, schools, and NGOs without consistent practice in responding to hazards, again highlighted in the UNDRR report.

Emergency response systems present opportunities for modernization. Samoa does not yet have a stockpile of emergency telecom equipment such as BGANs, routers, and VHF batteries, a gap identified in the *National Emergency Telecommunication Operational Plan (NETOP, 2019)*. Backup communication systems remain underdeveloped, with redundancy architecture still weak. Energy resilience is constrained by reliance on single power sources; this was demonstrated during the April 2025 energy crisis, when Samoa implemented nationwide electricity rationing due to limited generation capacity. Frontline response assets—including fire trucks, rescue boats, generators, and accessibility equipment—are insufficient, with the Samoa Fire & Emergency Services Authority noting the need for external support to procure modern equipment.

Finally, community ownership and trust in disaster systems can be enhanced. Local councils and NGOs are not yet fully empowered to lead resilience initiatives, as noted in the *National Action Plan for DRM 2017–2021*. Public trust in warnings is reduced by communication protocols that are not consistently inclusive or culturally sensitive. The *SPC PREP (2022)* found that hazard forecasts were not consistently tailored to community needs, reducing uptake and trust. Similarly, UNDRR's *Pacific Status Report (2022)* emphasized the need for more inclusive communication protocols to strengthen credibility. Building stronger community DRM committees, participatory workshops, NGO grants, and inclusive communication protocols will help increase credibility and trust, ensuring communities act quickly and confidently when hazards arise.

3.4.2. Closing the Gaps

Samoa can strengthen its preparedness culture by embedding hazard-specific contingency plans into regular revision cycles, ensuring they remain current and actionable for cyclones, tsunamis, pandemics, and floods. Technical capacity will grow through targeted recruitment, training curricula, and refresher courses that sustain expertise. Post-disaster learning will be institutionalized by establishing a national framework for after-action reviews, collecting and analyzing data, publishing lessons-learned reports, and tracking recommendations. Nationwide drills and simulations will be expanded by designing curricula, partnering with schools, NGOs, and churches, and embedding annual monitoring to foster a culture of readiness across all sectors.

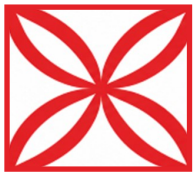
Emergency response systems will be modernized through the establishment of a telecom stockpile, including BGANs, routers, and VHF batteries, supported by clear protocols and training for ICT focal points. Redundancy in communication systems will be built by designing backup architecture, installing systems, and testing them through simulations. Energy resilience will be enhanced by procuring and installing solar systems, integrating tertiary backups, and training facility managers to maintain diversified power sources. Frontline and community-level response capacity will be expanded through the procurement of fire trucks, rescue boats, generators, and accessibility equipment, and lifesaving resources for communities to support evacuation and rescue efforts, alongside training responders and embedding annual drills and maintenance cycles.

Community ownership and trust will be deepened by empowering local councils and NGOs through the establishment of DRM committees, provision of grants, and participatory workshops that integrate local priorities into national frameworks. Inclusive communication protocols will be developed and rolled out, supported by training officers in culturally sensitive messaging and partnering with schools, churches, and NGOs to deliver nationwide awareness campaigns. Monitoring trust through surveys and feedback mechanisms will ensure continuous improvement and credibility of warnings.

3.4.3. Pillar 4 Roadmap: Outcomes, Outputs, and Activities

Intermediate Outcome 4.1 – Hazard Specific Contingency Planning & Preparedness Culture Hazard preparedness will be strengthened by updating contingency plans for cyclones, tsunamis, pandemics, and floods. Short-term actions include reviewing existing plans and drafting updates, followed by validation workshops and Cabinet endorsement in the medium term. Over the long term, revision cycles will be institutionalized to keep plans current. Technical staff capacity will be enhanced through HR assessments, recruitment, and training curricula, with refresher courses sustaining skills over time. Post disaster learning will be embedded by designing a framework for after action reviews, training agencies, and collecting and analyzing data. Lessons learned reports will be published and recommendations tracked to ensure continuous improvement. Preparedness culture will be deepened through nationwide drills, with curricula desig-

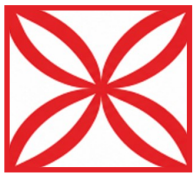
ned in the short term, partnerships with schools, NGOs, and churches rolled out in the medium term, and annual monitoring institutionalized in the long term.



Pacific Example: The Pacific Disability Forum (2023) piloted inclusive communication training in Samoa, producing sign language and pictorial messaging for disaster contexts. SPC's Fostering an Inclusive Pacific (2024) initiative further emphasized disability inclusion in disaster communication.

Estimated investment: USD 2 million

Intermediate Outcome 4.2 – Emergency Telecoms, Energy & Response Assets Emergency response systems will be modernized through investment in telecoms, energy, and frontline assets. In the short term, Samoa will procure emergency telecom equipment such as BGANs, routers, and VHF batteries, supported by protocols and training for ICT focal points. Redundancy will be built by designing backup communication architecture, installing systems, and training operators. Energy resilience will be enhanced by procuring and installing solar systems, integrating tertiary backups, and training facility managers. Frontline response assets—including fire trucks, rescue boats, generators, and accessibility equipment—will be procured and responders trained in their use. By the medium term, these systems will be fully integrated and tested through simulations and drills. Over the long term, annual maintenance, monitoring, and refresher training will institutionalize resilience, ensuring Samoa's emergency systems remain robust and reliable.



Pacific Examples: Solomon Islands launched a *Cell Broadcast Early Warning System* in 2025, delivering congestion-free alerts to all mobile handsets, even without credit or SIM cards. Tuvalu piloted solar-powered backup systems for critical facilities, reducing reliance on single power sources. Vanuatu, with support from JICA, procured modern fire trucks and rescue boats to strengthen frontline response capacity.

Estimated investment: USD 10.75 million

Intermediate Outcome 4.3 – Community Ownership & Trust Community resilience will be strengthened by empowering local councils and NGOs to take a leading role in disaster preparedness. Short-term actions include establishing DRM committees, providing NGO grants, and facilitating participatory workshops to integrate local priorities into national frameworks. In the medium term, these structures will be scaled through NGO workshops and nationwide awareness campaigns, supported by partnerships with schools, churches, and NGOs. Over the long term, community DRM structures will be fully integrated into national systems, ensuring grassroots ownership of resilience. Public trust in warnings will be enhanced by developing inclusive communication protocols, training officers in culturally sensitive messaging, and rolling out campaigns that make warnings credible and accessible. Monitoring trust through surveys and feedback mechanisms will embed accountability and ensure communities act quickly and confidently when hazards arise.

*Pacific Examples***:** The *Tonga Community Development Trust*, funded by Australia, established village DRM committees and participatory workshops that integrated local priorities into national frameworks. Fiji partnered with the Fiji Disabled Persons Federation to produce inclusive warning formats in sign language and pictorial versions. Vanuatu's awareness campaigns after Cyclone Harold (2020) built credibility by partnering with churches and schools to deliver culturally sensitive messaging.

Estimated investment: USD 3 million

Overall Pillar 4 Investment The total estimated cost for Pillar 4 is **USD 15.75 million** over the next decade. These investments—benchmarked against successful Pacific case studies—will close governance, preparedness, asset, and community trust gaps, building a disaster system that is unified, resilient, and community owned.

3.4.4. Pillar 4: Costed Implementation Plan

Table 4 PILLAR 4: Coasted Implementation Plan

Workplan Matrix – Pillar 4: Disaster Preparedness & Response

Pillar 4: Resilient community owned disaster system.

Intermediate Outcome 4.1 – Hazard-Specific Contingency Planning & Preparedness Culture

Gap Identified	Associated Outputs	Activities	Responsible Agencies	Short Term	Medium Term	Long Term	Est. Cost (USD)	Potential Financing
4.1.1 Outdated contingency plans	Updated cyclone, tsunami, pandemic, flood plans	Review existing plans Draft updated plans Validation workshops Cabinet endorsement Institutionalize revision cycle	MNRE- DMO, ALL SECTORS	Plan review & drafting	Validation & endorsement	Institutionalized cycle	500,000	WB PREP II, SPC GEM
4.1.2 Limited HR capacity	Strengthened technical staff	HR needs assessment Recruit technical staff Develop training curricula Conduct workshops Monitor skills	MNRE DMO, PSC, MOF	HR assess-ment & re-cruitment	Training rollout	Monitoring & refresher cours-es	500,000	UNDP, USP/ NUS
4.1.3 Weak post-disaster learning	After-action review mechanism	Develop framework Train agencies Collect/analyze data Publish lessons-Learned report Track recommendations	MNRE- DMO, PSC, SUNGOs	Framework design	Data collection & reporting	Institutionalized cycle	500,000	UNDP, WB PREP II
4.1.4 Limited drills	Nationwide training & simulation	Design curricula Conduct nationwide drills Partner with schools, NGOs, churches Run sectoral simula-tions Monitor culture	MNRE- DMO, ALL SECTORS, SCCI, Village Councils	Curriculum design	Drills & part-nerships	Annual moni-toring	500,000	UNICEF, Kiwa Initiative

3.4.4. Pillar 4: Costed Implementation Plan

Table 4 PILLAR 4: Coasted Implementation Plan

Workplan Matrix – Pillar 4: Disaster Preparedness & Response

						Subtotal	**2,000,000**	
Intermediate Outcome 4.2 – Emergency Telecoms, Energy & Response Assets								
Gap Identified	**Associated Outputs**	**Activities**	**Responsible Agencies**	**Short Term**	**Medium Term**	**Long Term**	**Est. Cost (USD)**	**Potential Financing**
4.2.1 Lack of telecom stockpile	Emergency telecom equipment	Procure BGANs, routers, VHF batteries Establish stockpile protocols Train ICT focal points Annual maintenance/ testing	MNRE DMO, MCIT, FIRST RESPONDERS	Procurement	Protocols & training	Annual maintenance	1,000,000	ITU, WB PREP II
4.2.2 Weak redundancy	Backup communication systems	Design redundancy architecture Install backup systems Train operators Test via simulations	MNRE DMO, MCIT, FIRST RESPONDERS	Architecture design	Installation & training	Annual testing	2,500,000	UNESCAP Digital Resilience
4.2.3 Limited energy resilience	Diversified power sources	Procure/install solar systems Integrate tertiary backup Train facility managers Maintenance & monitoring	EPC, MNRE-DMO, MCIT, EPC, MWTI (ENERGY SECTOR), MOF	Procurement	Integration & training	Annual monitoring	2,250,000	ADB Pacific Energy, WB PREP II

3.4.4. Pillar 4: Costed Implementation Plan

Table 4 PILLAR 4: Coasted Implementation Plan

Workplan Matrix – Pillar 4: Disaster Preparedness & Response								
Pillar 4: Resilient community owned disaster system.								
Intermediate Outcome 4.2 – Emergency Telecoms, Energy & Response Assets								
Gap Identified	**Associated Outputs**	**Activities**	**Responsible Agencies**	**Short Term**	**Medium Term**	**Long Term**	**Est. Cost (USD)**	**Potential Financing**
4.2.4 Resource shortages	Frontline response assets	Procure fire trucks, rescue boats, generators, first aid kits, accessibility equipment Establish asset protocols Train responders Annual drills/ maintenance	Fire & Emergency Services, Police, MNRE, MOH, MOF, SRCS	Procurement	Training & protocols	Annual drills	5,000,000	JICA, WB Infrastructure Resilience
						Subtotal	**10,750,000**	
Intermediate Outcome 4.3 – Community Ownership & Trust								
Gap Identified	**Associated Outputs**	**Activities**	**Responsible Agencies**	**Short Term**	**Medium Term**	**Long Term**	**Est. Cost (USD)**	**Potential Financing**
4.3.1 Limited community ownership	Local councils & NGOs empowered	Establish DRM committees Provide NGO grants Facilitate participatory workshops Integrate local priorities into DRM framework	MWCSD, MNRE-DMO, SUNGO, Village Councils, SRCS	Committee establishment	NGO grants & workshops	Integration into national DRM	1,500,000	UNICEF, UNDP, Kiwa Initiative

3.4.4. Pillar 4: Costed Implementation Plan

Table 4 PILLAR 4: Coasted Implementation Plan

Workplan Matrix – Pillar 4: Disaster Preparedness & Response

Gap Identified	Associated Outputs	Activities	Responsible Agencies	Short Term	Medium Term	Long Term	Est. Cost (USD)	Potential Financing
4.3.2 Low public trust	Credibility of warnings strengthened	Develop inclusive communication protocols	MNRE, DMO, MWCSD, NGOs, Media Council, SRCS	Protocol development	Training & campaigns	Monitoring and Evaluation	1,500,000	UNICEF, UN Women, WB PREP II
		Train officers in culturally sensitive messaging						
		Partner with churches, schools, NGOs						
		Nationwide awareness campaigns						
		Monitor trust via surveys						
						Subtotal	**3,000,000**	
						TOTAL	**15,750,000**	

3.5. PILLAR 5: PILLAR 5: INTERPILLAR- GOVERNANCE, COORDINATION, ADVOCACY, M&E ANDFINANCING FOR EWS

3.5.1. Gaps Identification

Samoa's disaster governance framework is strong in intent but still faces challenges that limit efficiency. Mandates across agencies overlap, and coordination can be fragmented, which slows decision-making during emergencies. For example, the National Disaster Management Plan (2017–2020) noted that responsibilities across 14 sector coordination units were not always clear, leading to duplication and delays in response. A national coordination framework needs to be strengthened to clarify roles, streamline responsibilities, and embed regular cross-agency collaboration so that institutions work as one system rather than in silos.

Financing remains another critical gap. Current disaster risk management relies heavily on donor support, with limited domestic mechanisms to sustain long term resilience. The Disaster Risk Financing Policy (2022 –2025) highlights that Samoa experiences average annual disaster losses of about US$10 million from cyclones and earthquakes, yet recovery is often funded through ad hoc donor support and budget reallocations. Samoa has yet to fully establish a disaster fund or diversify financing instruments such as levies, insurance, or public private partnerships. Without these, the system is vulnerable to external shocks and donor cycles, underscoring the importance of building a sustainable, homegrown financing base.

Institutional and operational readiness also requires strengthening. The National Emergency Operations Centre (NEOC) is under staffed, and surge capacity is not formalized through rosters or regular training. This was evident during the April 2025 national energy crisis, when Samoa declared a 30day State of Emergency and had to rely on rental generators shipped from New Zealand to maintain power supply. Continuity planning across ministries is inconsistent, leaving essential services exposed during crises. Updated sectoral contingency plans, integrated into the national DRM framework and tested through simulations, would ensure readiness and resilience across government.

Finally, crosscutting priorities need to be embedded more systematically. Monitoring and evaluation frameworks are fragmented, limiting accountability and evidence based adjustments. While Samoa has taken steps to integrate gender consideration-such as through the DMO Gender in DRM Policy (2015)- this policy now requires updating and more systematic implementation to ensure it remains aligned with current GEDSI standards and operational realities. Gender equality, disability, and social inclusion (GEDSI) are not consistently mainstreamed across all components of the system, leaving vulnerable groups underrepresented in planning, decision-making, and early warning dissemination. A Pacific Infrastructure GEDSI report (2025) noted that inclusivity in disaster planning and infrastructure delivery remains uneven across ministries. Safeguards for environmental and social impacts are also not applied uniformly, raising risks of unintended consequences. Addressing these areas will ensure that governance and financing reforms are not only technically sound but also inclusive, transparent, and trusted by communities.

3.5.2. Closing the Gaps

To strengthen governance and coordination, Samoa can strengthen its existing National Coordination Framework. This framework should clearly define mandates, streamline responsibilities, and embed quarterly coordination meetings across ministries. Over time, legislation can institutionalize these arrangements, ensuring that disaster governance operates as a unified system rather than fragmented silos.

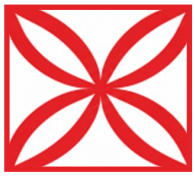
For financing, the priority is to operationalize the Disaster Risk Financing Policy (2022–2025) by creating a permanent disaster fund with annual budget allocations. Diversification of financing instruments — such as levies on utilities or tourism, expanded insurance coverage through the Pacific Catastrophe Risk Insurance Company (PCRIC), and public-private partnerships with telecoms and energy providers — will reduce donor dependence. Transparent annual reporting and audits will build confidence among both citizens and partners, ensuring predictable and sustainable funding.

Institutional and operational readiness can be strengthened by expanding staffing at the NEOC and formalizing surge capacity through rosters and regular training. Updated sectoral contingency plans should be drafted, tested through simulations, and integrated into the national DRM framework. Annual drills and continuity plan revisions will embed resilience across ministries and guarantee that essential services remain functional during crises.

Cross-cutting priorities must be embedded into every activity. A unified M&E framework with baseline indicators and annual scorecards will ensure accountability. GEDSI guidelines should be mainstreamed, with agencies trained to integrate inclusivity into drills, contingency plans, and communications. Environmental and social safeguards need to be consistently applied, supported by compliance audits. Together, these measures will ensure that governance and financing reforms are not only technically sound but also inclusive, transparent, and trusted by communities.

3.5.3. Pillar 5 Roadmap: Outcomes, Outputs, and Activities

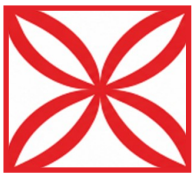
Outcome 5.1 – Strengthened Governance & Coordination To unify disaster governance, Samoa will strengthen its existing National Coordination Framework for DRM that clarifies mandates and streamlines responsibilities. In the short term (1–2 years), agencies will conduct an institutional review and review the framework. By the medium term (3–5 years), Cabinet endorsement and rollout will embed quarterly coordination meetings across ministries. In the long term (5+ years), coordination will be fully institutionalized through legislation and practice, ensuring agencies act as one system.



Pacific Example: Fiji and Solomon Islands established a Risk Governance Technical Working Group under the Pacific Resilience Partnership to clarify mandates and strengthen legal frameworks. Samoa's framework can draw on this model to ensure clarity and efficiency.

Estimated Budget: USD 1,000,000

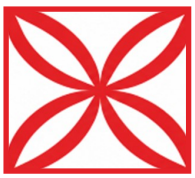
Outcome 5.2 – Sustainable Financing & Resource Mobilization To reduce reliance on donors, Samoa will establish sustainable domestic financing mechanisms. Short-term actions (1–2 years) include fiscal space analysis to identify opportunities. Medium-term priorities (3–5 years) are the creation of a disaster fund and development of financing instruments such as levies, PPPs, and insurance schemes. In the long term (5+ years), annual reporting cycles and audits will institutionalize transparency and accountability in disaster financing.



Pacific Example: Tonga's National Emergency Fund combines government and donor contributions, reducing reliance on ad hoc support. Similarly, the Pacific Islands Forum Disaster Risk Financing Roadmap (2023) provides guidance on diversifying instruments such as insurance and PPPs, which Samoa can adapt.

Estimated Budget: USD 1,200,000

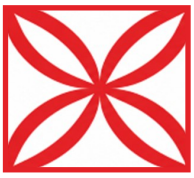
Outcome 5.3 – Institutional & Operational Readiness To strengthen readiness, Samoa will build a surge ready National Emergency Operations Centre (NEOC) and update sectoral contingency plans. In the short term (1–2 years), HR needs assessments and recruitment will expand staffing, while ministries begin drafting continuity plans. Medium term actions (3–5 years) include establishing surge rosters, training staff, and integrating continuity plans into the DRM framework. In the long term (5+ years), annual surge testing, simulations, and plan revisions will embed resilience across government and ensure essential services remain functional during crises.



Pacific Example: Vanuatu's NEOC Strengthening Project (UNDP, 2021) expanded staffing, introduced surge rosters, and tested continuity plans through national simulations. SPREP and JICA's Capacity Building on Climate Resilience Programme also delivered training to strengthen NEOC capacity across the region, offering models Samoa can replicate.

Estimated Budget: USD 3,500,000

Outcome 5.4 – Cross Cutting Elements To embed accountability, inclusivity, and safeguards, Samoa will implement three frameworks. A unified monitoring and evaluation (M&E) framework will be drafted in the short term, rolled out with dashboards and mid-term evaluations in the medium term, and institutionalized through annual scorecards and independent audits in the long term. GEDSI guidelines will be developed and piloted early, rolled out with agency training in the medium term, and embedded through annual audits and inclusivity scorecards in the long term. Environmental and social safeguards will be introduced through checklists and baseline reviews, expanded with training and monitoring in the medium term, and institutionalized through annual compliance audits in the long term. Together, these measures will ensure reforms are inclusive, transparent, and trusted.



Pacific Example: SPC's Hydrology Support for Flash Flood Early Warning Systems integrated GEDSI into disaster planning, while DFAT's GEDSI Pathways to Resilience mainstreamed inclusivity across Pacific climate programs. ADB's Pacific Safeguards Programme provides a model for embedding environmental and social safeguards consistently.

Estimated Budget: USD 750,000

Overall Summary – Pillar 5 Pillar 5 positions Samoa to achieve Unified Disaster Governance & Sustainable Financing by closing gaps in coordination, financing, operational readiness, and cross-cutting accountability. The roadmap invests **USD 6.45 million** over 10 years into this pillar. By drawing on proven Pacific examples — such as Fiji's governance reforms, Tonga's disaster fund, Vanuatu's NEOC strengthening, and SPC/DFAT GEDSI initiatives — Samoa's Pillar 5 builds on regional best practice while tailoring solutions to national needs. This ensures disaster systems are not only technically robust but also inclusive, transparent, and financially sustainable.

3.5.1. Pillar 5: Costed Implementation Plan

Table 5 PILLAR 5: Coasted Implementation Plan

Workplan Matrix – Pillar 5: Disaster Preparedness & Response								
Pillar 5 Outcome – Unified Disaster Governance & Sustainable Financing								
Outcome 5.1– Strengthened Governance & Coordination								
Gap Identified	**Associated Outputs**	**Activities**	**Responsible Agencies**	**Short Term (1–2 yrs)**	**Medium Term (3–5 yrs)**	**Long Term (5+ yrs)**	**Est. Cost (USD)**	**Potential Financing**
5.1.1 Fragmented mandates and overlapping roles.	Strengthened National Coordination Framework	Institutional review of mandates Draft coordination framework Cabinet endorsement Quarterly coordination meetings	MNRE, DMO, DAC	Review & drafting	Endorsement & rollout	Institutional-ized coordination	1,000,000	WB PREP II, UNDP Governance
						Subtotal	**1,000,000**	
Outcome 5.2 – Sustainable Financing & Resource Mobilization								
Gap Identified	**Associated Outputs**	**Activities**	**Responsible Agencies**	**Short Term (1–2 yrs)**	**Medium Term (3–5 yrs)**	**Long Term (5+ yrs)**	**Est. Cost (USD)**	**Potential Financing**
5.2.1 Donor dependence and insufficient domestic financing	Sustainable domestic financing mechanisms	Fiscal space analysis Establish disaster fund Develop financing instruments (levies, PPPs, insurance) Publish annual reports	MNRE-DMO, MOF	Fiscal analysis	Fund establishment & instruments	Annual reporting cycle	1,200,000	WB PREP II, IMF, ADB
						Subtotal	**1,200,000**	

3.5.1. Pillar 5: Costed Implementation Plan

Table 5 PILLAR 5: Coasted Implementation Plan

Workplan Matrix – Pillar 5: Disaster Preparedness & Response								
Pillar 5 Outcome – Unified Disaster Governance & Sustainable Financing								
Outcome 5.3 – Institutional & Operational Readiness								
Gap Identified	**Associated Outputs**	**Activities**	**Responsible Agencies**	**Short Term (1–2 yrs)**	**Medium Term (3–5 yrs)**	**Long Term (5+ yrs)**	**Est. Cost (USD)**	**Potential Financing**
5.3.1 Insufficient NEOC staffing and weak continuity planning	Surge-ready NEOC;	HR needs assessment	MNRE-DMO,PSC, MOF	HR assessment & recruitment	Surge roster & training	Annual surge testing	1,500,000	WB PREP II, UNDP Capacity
		Recruit permanent staff						
		Establish surge roster						
		Train surge staff						
		Test surge capacity						
	Sectoral contingency plans.	Draft continuity plans	MNRE-DMO,ALL SECTORS	Drafting & work-shops	Integration & testing	Annual revi-sions	2,000,000	UNDP, UNICEF, DFAT
		Sectoral workshops						
		Integrate into DRM framework						
		Test via simulations						
		Annual monitoring						
						Subtotal	**3,500,000**	

3.5.1. Pillar 5: Costed Implementation Plan

Table 5 PILLAR 5: Coasted Implementation Plan

Workplan Matrix – Pillar 5: Disaster Preparedness & Response								
Pillar 5 Outcome – Unified Disaster Governance & Sustainable Financing								
Outcome 5.4: Cross cutting Elements								
Gap Identified	**Associated Outputs**	**Activities**	**Responsible Agencies**	**Short Term (1–2 yrs)**	**Medium Term (3–5 yrs)**	**Long Term (5+ yrs)**	**Est. Cost (USD)**	**Potential Financing**
5.4.1. Cross-cutting gaps	Unified M&E Framework	Develop unified M&E framework for all pillars	MNRE-DMO, MOF	Draft M&E framework Baseline indicators	Mid-term evaluation Rollout of dashboard	Institutionalize annual M&E cycle	250,000	WB Govern-ance, UNDP, SPC
		Establish baseline indicators				Independent audits		
		Produce annual progress reports & scorecards						
		Commission independent audits						
	GEDSI Mainstreaming Guidelines	Develop GEDSI guidelines	MNRE-DMO, MWCSD, NGOs	Draft GEDSI framework	Rollout of GEDSI guidelines	Annual GEDSI audits	250,000	UNICEF, UN Women, SPC
		Train agencies on gender, disability & social inclusion		Capacity building workshops	Agency training	Community feedback surveys		
		Integrate GEDSI into contingency plans, drills, and communi-cation protocols						
		Conduct annual GED-SI audits						
		Publish inclusivity scorecards						

3.5.1. Pillar 5: Costed Implementation Plan

Table 5 PILLAR 5: Coasted Implementation Plan

Workplan Matrix – Pillar 4: Disaster Preparedness & Response								
Pillar 5 Outcome – Unified Disaster Governance & Sustainable Financing								
Outcome 5.4: Cross cutting Elements								
Gaps Identified	**Associated Output**	**Priority Activities**	**Responsible Agencies**	**Short Term (1–2 yrs)**	**Medium Term (3–5 yrs)**	**Long Term (5+ yrs)**	**Est. Cost (USD)**	**Poten-tial Fi-nancing**
	Environmental & Social Safeguards	Develop safeguards checklist	MNRE-DMO, MWTI- PU-MA, MOF,	Draft safeguards checklist	Rollout of safeguards	Annual safeguards compliance audits	250,000	WB, ADB, UNDP
		Train agencies on safeguards compliance						
		Conduct baseline environmental & social impact reviews		Baseline compliance review	Training programs			
		Roll out safeguards monitoring						
		Institutionalize annual safeguards audits						
						Subtotal	**750,000**	
						TOTAL	**6,450,000**	

4. IMPLEMENTATION STRUCTURE AND APPROACH

Implementation Arrangements: The roadmap will be implemented under the existing implementation arrangements for the Multi-Hazard Early Warning Systems Policy whereby a Multi-Hazard Early Warning System (MHEWS) Task Force, chaired by the Chief Executive Officer of the Ministry of Natural Resources and Environment (MNRE), will be established under the auspices of the Disaster Advisory Committee and the National Environment Sector Steering Committee.

The MNRE Meteorology Division will serve as the Secretariat to the Task Force, responsible for preparing and submitting the Terms of Reference (ToR) for approval and adoption.

Membership of the Task Force will comprise representatives from relevant Government ministries, State-Owned Enterprises, Non-Government Organisations (NGOs), and Civil Society Groups, ensuring broad-based participation and inclusivity.

The Task Force will provide strategic oversight of the implementation, coordination, monitoring, and evaluation of the national MHEWS policy, ensuring alignment with Samoa's disaster risk management framework and sectoral priorities.

Financing Structure The financing strategy for Samoa Multi-hazard Early Warning for All Roadmap combines domestic resource mobilization with external support. The National Disaster Fund, managed by MOF, will be expanded to cover EW4All investments, with annual budget allocations. Samoa will also explore sector-specific levies (e.g. utilities, tourism), risk transfer mechanisms through PCRIC, and public-private partnerships with telecoms, energy providers, and financial institutions to co-finance resilience infrastructure.

External financing will be sourced from multilateral partners including the World Bank (PREPARE), ADB, IMF, UNDP, and ITU ; regional mechanisms such as PCRIC, SPC, and the Kiwa Initiative; and bilateral donors including DFAT, JICA, EU, and USAID.

The financing approach is phased: short-term actions (1–2 years) will focus on fiscal space analysis, fund expansion, and donor pipeline mapping; medium-term priorities (3–5 years) include establishing levies, PPP agreements, and blended financing models; and long-term actions (5+ years) will institutionalize annual reporting, audits, and transparent financing dashboards. This structure ensures predictable, diversified, and accountable funding for sustained disaster governance.

1. MONITORING AND EVALUATION

To achieve the 10- year vision of Samoa's Multi Hazard *Early Warnings for All (EW4ALL)* initiative, it is essential to establish a robust system for tracking progress, informing decision-making, and demonstrating results. This framework is grounded in Samoa's national priorities, institutional capacities, and commitment to inclusive resilience.

A comprehensive monitoring and evaluation framework will be implemented, drawing on the data systems and technical expertise of national agencies, village councils, and regional partners. Guided by results -based management principles, it reflects Samoa's governance structures, community engagement practices, and disaster risk landscape.

A *Theory of Change* (ToC) has been developed to map how interventions to address the key gaps across five pillars will lead to the desired outcomes and impact.

Building on this, the M&E framework includes jointly agreed KPIs providing a balanced mix of executive-level measures (headline indicators for donors and Cabinet) and technical-level measures (secondary indicators for agencies and communities). Together, they ensure Samoa's Multi Hazard EW4ALL Roadmap is measurable, inclusive, and accountable, while enabling adaptive management and continuous improvement.

Table 6: M&E Pillar Indicators

Pillar	Headline Indicators (Donor/Executive)	Secondary Indicators (Internal/Technical)
Pillar 1: Inclusive Hazard Data	1. % of hazard/risk datasets digitized and integrated into the National Multi-Hazard Data Platform (USD 1.6M) 2. % of national territory covered by updated, digitized hazard maps accessible to planners/communities (USD 2M)	• Proportion of hazard maps available in inclusive formats (braille, bilingual, pictorial) • # of validated hybrid protocols combining indigenous forecasting with scientific data
Pillar 2: Trusted Hazard Detection, Monitoring & Forecasts	3. % of territory/population covered by operational rain gauges, sea level sensors, and flood monitoring stations (USD 8M) 4. % of local disaster committees trained and disseminating impact based forecasts in accessible formats (USD 2M)	• Proportion of observation stations transmitting real-time data to monitoring centers • # of agencies regularly contributing to centralized hazard data repository
Pillar 3: Resilient Multi Channel Warning & Communication	5. % of rural/outer island communities with operational sirens, loudspeakers, and cell broadcast coverage (USD 4M) 6. # of after-action reviews conducted annually and % of recommendations integrated into SOPs (USD 2.55M)	• % of warning messages available in inclusive formats (multilingual, braille, sign language, pictorial) • % of community disaster committees actively engaged in feedback mechanisms

Pillar	Headline Indicators (Donor/Executive)	Secondary Indicators (Internal/Technical)
Pillar 4: Community Owned Preparedness & Response	7. % of frontline facilities equipped with telecoms, diversified power sources, and critical assets (USD 10.75M) 8. % of villages with active DRM committees integrated into the national DRM framework (USD 1.5M)	• % of national contingency plans reviewed, validated, and institutionalized • # of technical staff recruited, trained, and retained in DRM agencies
Pillar 5: Unified Governance & Sustainable Financing	9. % of annual disaster financing sourced from domestic mechanisms (trust fund, levies, PPPs, insurance) (USD 1.2M) 10. Annual publication of progress reports and scorecards across all EW4ALL pillars, with independent audits (USD 0.25M)	• % of contingency plans, drills, and communication protocols integrating GEDSI and safeguards, verified through annual audits

Monitoring and Evaluation Plan The Monitoring and Evaluation (M&E) plan for Samoa's EW4ALL Roadmap is designed to track progress toward the ten-year goals, provide evidence for informed decision making, and ensure accountability, inclusivity, and adaptive management. It is structured around the five EW4ALL pillars, with headline indicators tailored for executive reporting, and secondary indicators focused on technical and internal monitoring. This dual layered approach ensures that both high-level outcomes and detailed operational progress are captured, strengthening transparency and responsiveness across all levels of governance.

Monitoring will be carried out through a clear schedule: headline indicators reported annually to Cabinet and executive partners, while secondary indicators are tracked quarterly by technical agencies. Data will be drawn from the National Multi-Hazard Data Platform, DRM agency reports, telecom operators, village councils, MoUs, training records, and after-action reviews, with verification through independent audits, field surveys, dashboards, and community feedback. Responsibility is shared across institutions, with MNRE/DMO leading coordination, working with other relevant agencies on monitoring and evaluation components of the plan and, thereby embedding resilience and accountability into Samoa's disaster governance system.

The Roadmap's Monitoring and Evaluation plan ensures accountability and learning through a mid-term evaluation in Year 5 to review progress, gaps, and lessons, followed by a final evaluation in Year 10 to assess outcomes, sustainability, and impact. Annual community feedback via surveys and village council consultations will validate inclusivity and trust, while adaptive learning integrates recommendations into SOPs, contingency plans, and donor reports. Reporting is structured through an annual public scorecard showing progress by pillar, executive briefs highlighting key indicators and financing, and simplified community reports in accessible formats such as radio, infographics, and bilingual summaries.

Table 7: Roadmap KPIs Monitoring Plan

Pillar	Headline Indicators (Executive/Donor)	Secondary Indicators (Technical/Internal)	Data Source & Verification	Frequency	Responsible Agencies
Pillar 1: Inclusive Hazard Data	1. % of hazard/risk datasets digitized and integrated into the National Multi-Hazard Data Platform (USD 1.6M) 2. % of national territory covered by updated, digitized hazard maps accessible to planners/ communities	• Proportion of hazard maps available in inclusive formats (braille, bilingual, pictorial) • # of validated hybrid protocols combining indigenous forecasting with scientific data	Data platform, GIS maps, MoUs	Quarterly (secondary), Annual (headline)	MNRE, MCIT, SBS
Pillar 2: Trusted Detection & Forecasts	3. % of territory/ population covered by operational rain gauges, sea level sensors, and flood monitoring stations (USD 8M) 4. % of local disaster committees trained and disseminating impact based forecasts in accessible formats (USD 2M)	• Proportion of observation stations transmitting real time data to monitoring centers • # of agencies regularly contributing to centralized hazard data repository	telemetry, training records, repository logs	Quarterly	MNRE, MCIT, SPC, WMO
Pillar 3: Multi Channel Warning & Communication	5. % of rural/outer island communities with operational sirens, loudspeakers, and cell broadcast coverage (USD 4M) 6. # of after-action reviews conducted annually and % of recommendations integrated into SOPs (USD 2.55M)	• % of warning messages available in inclusive formats (multilingual, braille, sign language, pictorial) • % of community disaster committees actively engaged in feedback mechanisms	Telecom MoUs, siren tests, SOP reviews, community surveys	Quarterly (secondary), Annual (headline)	MCIT, MWCSD, SUNGO, Telecom Operators

Table 7: Roadmap KPIs Monitoring Plan

Pillar	Headline Indicators (Executive/Donor)	Secondary Indicators (Technical/Internal)	Data Source & Verification	Frequency	Responsible Agencies
Pillar 4: Community Preparedness & Response	7. % of frontline facilities equipped with telecoms, diversified power sources, and critical assets (USD 10.75M) 8. % of villages with active DRM committees integrated into the national DRM framework (USD 1.5M)	• % of national contingency plans reviewed, validated, and institutionalized # of technical staff recruited, trained, and retained in DRM agencies	Facility audits, DRM committee records, HR reports	Bi-annual	DMO, PSC, MNRE, MOH, MWCSD
Pillar 5: Governance & Financing	9. % of annual disaster financing sourced from domestic mechanisms (trust fund, levies, PPPs, insurance) (USD 1.2M) 10. Annual publication of progress reports and scorecards across all EW4ALL pillars, with independent audits (USD 0.25M)	• % of contingency plans, drills, and communication protocols integrating GEDSI and safeguards, verified through annual au-dits	MOF reports, audit scorecards, inclusivity surveys	Annual	MOF, MNRE, PSC, MWCSD

2. THEORY OF CHANGE

Table 8: Theory of Change

Pillar	Gaps	Activities	Outputs	Intermediate Outcomes	Pillar Out-come	Impact
Pillar 1: Disaster Risk Knowledge	• Fragmented hazard/risk data • ICT gaps, outdated maps • Limited inclusivity • Weak DRR M&E, inadequate reporting • Limited SADD data • Limited traditional knowledge &research	• Launch multi-hazard data platform • Upgrade ICT systems • Digitize maps & inclusive formats • Strengthen M&E dashboards & annual DRR reports • Upgrade statistics & inclusive data collection • Document indigenous forecasting • Build research repository & scholarships	• Operational data platform • Interoperable ICT • Updated maps & inclusive dissemination • Strengthened M&E & annual reports • Upgraded statistics & inclusive data collection • Indigenous forecasting documented • Applied research repository • Strengthened research capacity	1.1 Integrated National Multi-Hazard Data Platform 1.2 Strength-ened Monitoring, Evaluation & Inclusive Data 1.3 Integration of Traditional Knowledge & Research	Inclusive hazard data blending science and tradition	Samoa sustains a trusted, inclusive multi-hazard early warning system that protects ALL and enables effective, community-centered response.
Pillar 2: Detection, Observato-ry, Forecasts & Monitor-ing	• Inadequate observation infrastructure • Poor maintenance, weak telemetry • Flood monitoring gaps, road hotspot risks • Workforce shortages, poor retention • Poor data shar-ing, fragmented repositories • Complex forecasts, poor accessibility	• Procure/install sensors • Calibration protocols, telemetry systems • Flood/road monitoring, stress sensors • QA audits, national standards • Curricula, scholarships, CPD programs • MoUs for data sharing, centralized repository • Impact-based protocols, infographics, community training	• Expanded observation infrastructure • Real-time telemetry • Flood/road/stress monitoring systems • National standards & QA systems • Skilled workforce • Data sharing protocols • Centralized repository • Impact-based forecasts • Accessible materials • Trained committees	2.1 Reliable National Ob-servation System 2.2 Skilled Workforce 2.3 Seamless Data Sharing 2.4 Impact-Based Forecasts	Trusted hazard detection, monitor-ing, and clear forecasts	Samoa sustains a t rusted, inclusive multi-hazard early warning system that protects ALL and enables effective, community-centered response.

2. THEORY OF CHANGE

Table 7: Theory of Change

Pillar	Gaps	Activities	Outputs	Intermediate Outcomes	Pillar Outcome	Impact
Pillar 3: Warnings Dissemination & Communication	• Limited rural coverage • Weak last-mile dissemination • Critical gaps in sirens/radio/SMS • Non-inclusive content • Outdated/ fragmented SOPs • Weak community trust	• Coverage assessments • Siren installation, telecom MoUs • Pilot community networks, radio upgrades, SMS expansion • Multilingual/ disability-inclusive templates • Harmonized SOPs, digitized protocols • Post-event reviews, inclusive training, feedback mechanisms	• Expanded rural coverage • Multi-channel infrastructure • Inclusive warning content • National communication protocol • Post-event evaluation framework • Digitized SOPs • Inclusive templates • Community feedback mechanisms	3.1 Reliable Multi-Channel Early Warning Systems 3.2 Regulatory Frameworks & Telecom Integration 3.3 Harmonized SOPs & Continuous Improvement 3.4 Inclusive Warning Messages 3.5 Community Participation & Trust	Resilient multi-channel warnings with inclusive communication	Samoa sustains a trusted, inclusive multi-hazard early warning system that protects ALL and enables effective, community-centered response.
Pillar 4: Disaster Preparedness & Response	• Outdated contingency plans • Limited HR capacity • Weak post-disaster learning • Limited drills • Lack of telecom stockpile • Limited energy resilience • Low public trust	• Update contingency plans • HR recruitment & training • After-action review framework • Nationwide drills • Procure telecom/ energy assets, backup systems, solar power • Strengthen frontline response assets • DRM committees, inclusive communication protocols, awareness campaigns	• Updated contingency plans • Strengthened technical staff • After-action review mechanism • Nationwide drills • Emergency telecoms & backup systems • Diversified energy • Frontline assets • Empowered councils & NGOs • Strengthened credibility of warnings	4.1 Hazard-Specific Contingency Planning & Preparedness Culture 4.2 Emergency Telecoms, Energy & Response Assets 4.3 Community Ownership & Trust	Resilient, community-owned disaster system	Samoa sustains a trusted, inclusive multi-hazard early warning system that protects ALL and enables effective, community-centered response.

2. THEORY OF CHANGE

Table 7: Theory of Change

Pillar	Gaps	Activities	Outputs	Intermediate Outcomes	Pillar Outcome	Impact
Pillar 5: Unified Governance & Sustainable Financing	• Coordination gaps • Donor dependence • Insufficient NEOC staffing • Weak continuity planning • Cross-cutting gaps in M&E, GEDSI, safeguards	• Institutional review • Coordination framework • Fiscal space analysis • Disaster fund, financing instruments • HR recruitment, surge roster • Continuity plans • Unified M&E framework • GEDSI guidelines • Safeguards checklist	• National Coordination Framework • Sustainable financing mechanisms • Surge-ready NEOC • Sectoral contingency plans • Unified M&E • GEDSI mainstreaming • Safeguards institutionalized	5.1 Strengthened Governance & Coordination 5.2 Sustainable Financing & Resource Mobilization 5.3 Institutional & Operational Readiness 5.4 Cross-Cutting Elements	Unified disaster governance and sustainable financing	Samoa sustains a trusted, inclusive multi-hazard early warning system that protects ALL and enables effective, community-centered response.