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GENDER-RESPONSIVE AND DISABILITY-INCLUSIVE EARLY WARNING AND EARLY ACTION IN THE PACIFIC REGION

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Citation: United Nations Office for Disaster Risk Reduction. *Gender-Responsive and Disability-Inclusive Early Warning and Early Action in the Pacific Region: Findings and Recommendations for Future Action.* Geneva: 2023.

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Acknowledgements

This scoping study was prepared by the United Nations Office for Disaster Risk Reduction (UNDRR) under the Climate Risk Early Warning Systems (CREWS) Pacific project. The research was conducted in person and remotely and involved a literature review, community consultations and key informant interviews from representatives of the organizations directly involved in the production, implementation and dissemination of early warnings in the Pacific.

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Gender-Responsive and Disability-Inclusive Early Warning and Early Action in the Pacific Region

Findings and Recommendations for Future Action

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ABBREVIATIONS

BCP	Business continuity plan
BMKG	Indonesian Agency for Meteorology, Climatology and Geophysics
CAP	Common Alerting Protocol
COP	United Nations Climate Change Conference
COVID-19	Coronavirus disease
CREWS	Climate Risk and Early Warning Systems
CSO	Civil society organization
DRR	Disaster risk reduction
EWS	Early warning system
GEDSI	Gender equality, disability and social inclusion
HRBA	Human rights-based approach
IASC	Inter-agency Standing Committee
IBFWS	Impact-based forecasting and weather services
IPCC	Intergovernmental Panel on Climate Change
KII	Key informant interview
LDC	Least developed country
MHEWS	Multi-hazard early warning systems
NDMO	National Disaster Management Office
NMHS	National Meteorological and Hydrological Service
OPD	Organization of persons with disabilities
PDNA	Post-disaster needs assessment
SPC	Pacific Community
SPREP	Secretariat of the Pacific Regional Environment Programme
SOGIESC	Sexual orientation, gender identity and expression, and sex characteristics
SOP	Standard operating procedure
TC	Tropical cyclone
UNDRR	United Nations Office for Disaster Risk Reduction
UNEP	United Nations Environment Programme
UNESCAP	United Nations Economic and Social Commission for Asia and the Pacific
UNFPA	United Nations Population Fund
UN Women	United Nations Entity for Gender Equality and the Empowerment of Women
WMO	World Meteorological Organization

Credit to Pacific Disability Forum


Credit to UNWOMEN

EXECUTIVE SUMMARY

Early warning is a critical component of disaster risk reduction (DRR) and an effective system to protect lives and livelihoods. To be effective, early warning systems (EWS) should not only have a sound scientific basis and reliable technology, but also should be people-centred, end-to-end, multi-hazard, trusted and accessible to all. They should consider the unique needs and capacities of different groups, including people who are marginalized or living in vulnerable situations.

Globally, only 40 per cent of the members of the World Meteorological Organization reported having a multi-hazard early warning system (MHEWS) in place. This also means that one third of people in 73 countries that provided information are not covered by adequate early warnings.[1] As the Pacific Small Island Developing States (SIDS) are increasingly affected by the impacts of climate change, there is a greater need for reliable and timely climate information and EWS. Many small islands, especially those with facing the highest risks with the least resources, remain highly challenged in building and sustaining integrated, people-centred, end-to-end EWS that are fully functional across the four interrelated components of EWS: (1) disaster risk knowledge; (2) detection, monitoring, analysis and forecasting of hazards; (3) dissemination and communication; and (4) preparedness and response to the warnings received.[2] Recognizing the importance of EWS, the Secretary-General of the United Nations has called for every person on Earth to be protected by EWS within five years. An Executive Action Plan 2023–2027 for Early Warning for All initiative was launched at the United Nations Climate Change Conference in Sharm el-Sheikh in 2022 (COP27). The Executive Action Plan calls for empowerment and access to information for all, including those who face significant challenges and disabilities. This report seeks to contribute to the implementation of the Executive Action Plan through identifying gaps and opportunities to enhance gender-responsive and disability-inclusive early warning early action in the Pacific.

Furthermore, to complement the outcomes of the Mid-term Review of the Sendai Framework and national consultations in the Pacific, this report provides additional findings and opportunities to advance the implementation of risk-informed early warning early action in the Pacific. It also aims to contribute to the implementation of the regional policy direction set by the Inaugural Pacific Disaster Management Ministers meeting in Nadi, Fiji in September 2022,[3] and to the outcomes of the Asia-Pacific Ministerial Conference on Disaster Risk Reduction in Brisbane, Australia in 2022 that highlighted the need for inclusive and people-centred MHEWS in the Pacific.[4]

Most importantly, the report explores the barriers, challenges and opportunities to strengthening gender-responsive and disability-inclusive early warning early action in the Pacific, focusing on existing policies, practices and knowledge. It seeks to capture evidence on risk perception, warning practices and response mechanisms that could be leveraged to make EWS inclusive and people-centred. The report draws on an extensive literature review on Pacific countries, as well as key informant interviews and community consultations in Fiji, to understand the local reality.

Communities across the Pacific predominantly trust and rely on national governments, traditional and local mechanisms (such as chiefs, heads of villages and chief councils), religious institutions such as churches, word of mouth, and family and community members to receive climate information and warning alerts. However, the warning messages and communication channels are

1 Johannes Cullmann and others, eds., *2020 State of Climate Services: Risk Information and Early Warning Systems* (Geneva, WMO, 2020).
2 IPCC, *Climate Change 2022: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change*, Hans-Otto Pörtner and others, eds. (Cambridge, United Kingdom and New York, Cambridge University Press, 2022).
3 SPC, "Inaugural Pacific Disaster Risk Reduction Ministers Meeting (14th–16th September) 2022". Available from https://gem.spc.int/meetings/inaugural-pacific-disaster-risk-reduction-ministers-meeting-14th-16th-september-2022 (accessed on 9 May 2023).
4 Asia-Pacific Ministerial Conference on Disaster Risk Reduction, "APMCDRR co-chairs' statement, 22 September 2022", 2022.

not always tailored to meet the diverse needs of different users, especially persons with disabilities. Traditional and local knowledge for detecting and monitoring hazards and preparing for and responding to disasters is an integral part of the Pacific communities which play a key role in EWS value chain.

Although communities are often referred to as the "last mile" of the warning system, they should be seen as the "first mile" in designing EWS. The first mile approach involves communities from the beginning of developing an EWS, rather than adding them towards the end of design process.[5] The study found that limited or low engagement of the community members in co-designing the EWS affects the effectiveness of warnings and response to disasters. Some of the risk communication strategies, EWS, response and evacuation measures have not been tested with community members. This can be improved by engaging communities, especially persons with disabilities, in shaping and sustaining EWS and conducting regular drills.

Additionally, to meet the first-mile needs, EWS must recognize and adapt to diverse factors, including the socioeconomic situation, accessibility of basic services and resources, literacy levels, access to communication technologies, cultural values, power dynamics, freedom of movement, and physical location. Increasingly, more focus should be placed on intersectionality, inviting decision makers and practitioners to reconsider how we perceive individual vulnerability and whether EWS will ensure successful outcomes for marginalized individuals and groups.

The findings show that Pacific SIDS have well-established institutional and legislative frameworks for disaster risk management, including action on climate change. There are many initiatives and efforts to achieve a shared vision and commitment across SIDS to mainstream gender and disability inclusion into DRR and EWS. While gender and disability are integrated into and referenced in the national policies and strategies, insufficient information and understanding of the root causes of vulnerability and limited capacity to address them in local disaster management plans and response mechanisms remain challenging. In reality, many tasks remain to effectively implement and apply mainstreaming commitments.

Both policies and practices demonstrate a limited analysis of intersectional vulnerability by gender, age, disability, socioeconomic status, living location, and other factors. There has not been a technically robust investment in the collection of detailed disaggregated data to identify and analyse intersectional vulnerability and how to measure progress on inclusion. This study found limited evidence on measuring the effectiveness of EWS across the Pacific countries. This remains a gap in EWS implementation at any stage of a disaster, and it is especially not a systematic part of post-disaster assessments at the country level. Collecting robust disaggregated data, analysing intersectional vulnerability, conducting an accessibility evaluation of EWS and reviewing the performance of EWS might require technical expertise and a field presence beyond the current staffing level of National Disaster Risk Management Offices (NDMOs) and National Meteorological and Hydrological Services (NMHSs).

Despite significant investments in EWS in the Pacific largely by international and intergovernmental agencies, limited infrastructure, fragmented funding for EWS projects, and the limited capacities of small and underresourced NDMOs and NMHS pose challenges in covering the entire country and reaching everyone through tailored warning messages.

Within the project development phase, it appears that gender equality, disability and social inclusion (GEDSI) analysis and approaches have not been sufficiently mainstreamed into EWS. This has led to a missed opportunity to benefit from available global guidelines, assessment tools, and markers on gender and disability inclusion. When consulted, national authorities highlighted the challenges in analysing and addressing intersectional vulnerabilities in their EWS-related plans and procedures. Consequently, national governments, particularly NDMOs and NMHSs, do not demonstrate the use of practical tools and guidelines on how to

5 Ilan Kelman and Michael Glantz, "Early warning systems defined", in *Reducing Disaster: Early Warning Systems for Climate Change, Zinta Zommers and Ashbindu Singh*, eds. (Dordrecht, Netherlands, Springer, 2014).

integrate a gender-responsive and disability-inclusive approach into their workplans. There were very few examples of warning information in accessible formats (braille, DAISY, sign language, captioned video, pictures, easy-to-understand language, etc.) found through this research. A very limited number of Pacific countries are using sign language interpreters on a regular basis to transmit critical information and warning alerts through national television channels.

Understanding the links between human rights and early warnings will ensure that warnings travel the "first mile" by increasing the accountability of government agencies that are responsible for issuing warnings. Using a human rights-based approach will facilitate participation of vulnerable and marginalized groups in designing and implementation of people-centred and inclusive EWS. Pacific SIDS already have a number of national policies and frameworks that promote gender equality and disability inclusion in DRR; however, more explicit actions, targets and benchmarks on early warnings will enhance the ongoing work.

As Pacific SIDS face increasingly impactful hazards, significant investments in improving the reach and measuring the impact and effectiveness of EWS must be prioritized. This report includes a number of recommendations aimed at strengthening inclusive EWS, and as such is a contribution towards the implementation of the CREWS Pacific project.

01

INTRODUCTION

- Background
- Objective of this research
- Methodology
- Limitations
- Introduction to the terminology used in this report

Credit to Pacific Disability Forum

1.1. BACKGROUND

Climate Risk and Early Warning Systems (CREWS) is an initiative that was established in 2015 at the United Nations Climate Change Conference in Paris (COP21) to protect the lives, assets and livelihoods of people living in the least developed countries (LDC) and Small Island Developing States (SIDS) by increasing their access to early warning on adverse weather conditions and risk information.

CREWS Pacific SIDS 2.0, as it is known, is the second regional CREWS project in the Pacific, and seeks to strengthen existing early warning systems (EWS) that are part of the region's stronger and more comprehensive human security and resilience agenda. The four-year project is jointly implemented by the World Meteorological Organization (WMO), the United Nations Office for Disaster Risk Reduction (UNDRR), and the World Bank Global Facility for Disaster Reduction and Recovery.

The project is structured around five main components:

1. Improved governance structures
2. Enhanced product development and accessibility
3. Enhanced service delivery
4. Enhanced communication and awareness programmes on EWS
5. Improved integration of gender and people living with disabilities across the EWS chain

This scoping study is conducted to contribute to the fifth component to mainstream gender and disability across the EWS chain. The finding will inform the guide and a checklist on how to integrate gender and disability into EWS.

The Sendai Framework for Disaster Risk Reduction 2015–2030 has prioritized early warning as one of its seven targets (Target G), urging countries to substantially increase the availability of, and access to, multi hazard early warning systems (MHEWS) and disaster risk information.[6] Progress towards Target G enables governments to assess the availability of and access to MHEWS. To date, 120 countries have provided information on their Target G status, of which 95 reported the existence of MHEWS (Figure 1). Coverage is particularly low in the SIDS and LDCs – less than half of LDCs, and only one-third of SIDS, have reported existence of MHEWS (Figure 2).[7]

In the Pacific, nine countries (Federated States of Micronesia, Fiji, Kiribati, Marshall Islands, Nauru, Palau, Solomon Islands, Tuvalu and Vanuatu) reported on the existence of MHEWS (Indicator G-1) in 2021. This illustrates that further work is needed to improve countries' reporting on climate information and EWS capacity to obtain a complete picture on the status of MHEWS in the Pacific. In addition to the need to increase the Pacific countries reporting on Target G, measuring the effectiveness of EWS should be prioritized.

1.2. OBJECTIVE OF THIS RESEARCH

This scoping study aims at examining (1) how diverse groups (women, men, children, older persons, persons with disabilities, people with diverse sexual orientation, gender identity and expression, and sex characteristics [SOGIESC]) access, process, disseminate, respond to and act on early warning messages; (2) how their social, cultural, economic and physical environments, including gender norms, roles and relationships, determine their vulnerability to disasters, and their participation in decision-making, planning, monitoring and implementing EWS in the Pacific region; and (3) how well existing EWS consider the specific needs and priorities of various individuals and groups. The research identifies gaps in current policies and practices, knowledge and information, and tools, and provides recommendations to strengthen future actions on early warning and early actions in the Pacific region.

6 United Nations, *Sendai Framework for Disaster Risk Reduction 2015–2030* (2015).
7 Target G-1 represents/combines other indicators. UNDRR, "Sendai Monitor". Available from https://sendaimonitor.undrr.org/analytics/country-global-target/16/8?indicator=33&countries=107 (accessed on 2 May 2023).

Figure 1. Number of countries reporting having MHEWS by year, 2015–2021

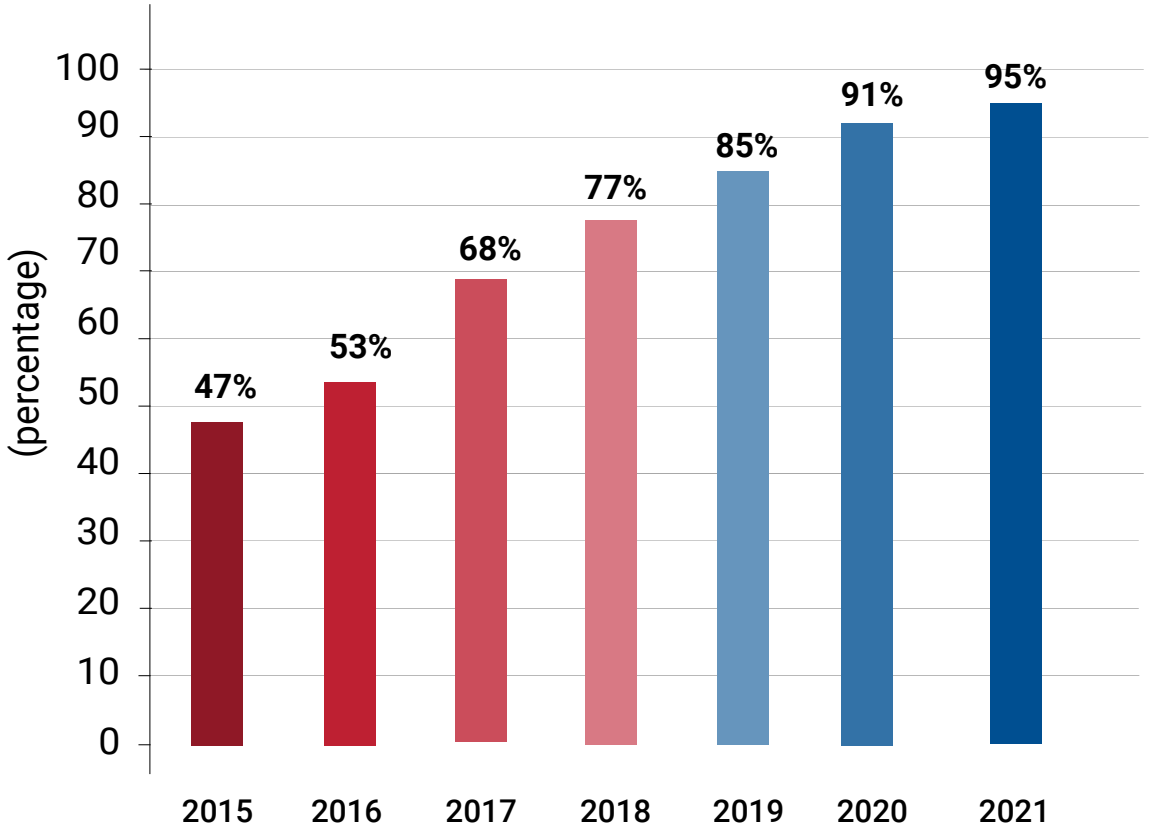
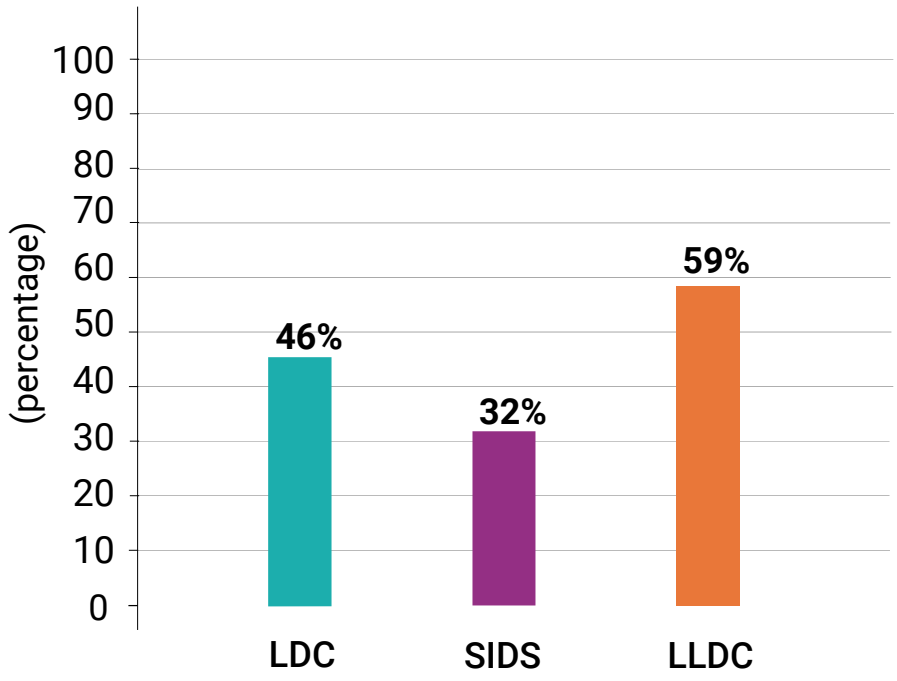


Figure 2. LDCs, SIDS and landlocked developing countries reporting having MHEWS



1.3. METHODOLOGY

This research engaged three modalities: a desk review, community consultations, and key informant interviews (KIIs).

Desk review: The desk review examined how gender, age, disability and other factors are reflected in EWS policies and strategies across the Pacific, by reviewing existing literature across four main domains:

- **Global and regional guidelines and tools:** Global frameworks, guidelines and toolkits on disaster risk reduction (DRR), gender and disability inclusion were consulted to collect best practice and develop policy recommendations.
- **Global and regional evidence and information:** Wider publications from research documents, workshop reports and published articles on gender-responsive and disability-inclusive DRR, were reviewed to collect evidence, identify further emerging good practice and make context-appropriate policy recommendations for the region.
- **National policies and plans:** The available national policies, strategies and action plans on DRR of the 14 countries and territories in the Pacific region were analysed against the agreed parameters of gender, disability and other vulnerability considerations, for each EWS and associated communication plans.
- **National practice:** Field documentation of any available and relevant reports and review papers on the implementation of EWS in the Pacific region were also reviewed.

The desk review looked at how effectively early warnings are reaching all members in the communities and whether they elicit the intended responses, through posing the following questions:

- Does the national DRR policy/strategy/action plan include an appropriate level of gender, disability and other vulnerability analyses and considerations?
- Is there evidence of considerations of gender, disability and other vulnerabilities on EWS during its design, implementation and any post-disaster phases?
- Are there guidelines or tools and any evidence specially focusing on the gender sensitivity and disaster inclusiveness in EWS?
- Is there a written standard operating procedure (SOP), memorandum of understanding and business continuity plan (BCP) that include intersectional analysis for EWS?
- Are there reported practices of gender-responsive and disability-inclusive EWS, with sound evidence?
- What are the enablers and barriers for implementation of gender-responsive and disability-inclusive EWS?

Community consultations: To further understand the field reality, the research collected information on current practices, perceptions and experiences on EWS across a wide range of individuals with different backgrounds and key stakeholders in each community. In-person community consultations were conducted with women's groups and community members in seven villages of Fiji. The field consultations particularly aimed to collect qualitative information from women, girls, persons with disabilities and older persons, making their voices heard was considered an important priority. The consultation combines individual interviews with focus group discussions and self-assessments. Analyses of the intersectionality of the surveyed community (gender, age, disabilities, ethnic background, location setting, assigned community responsibilities) provided insightful information and facilitated validation of early assumptions made during the desk review.

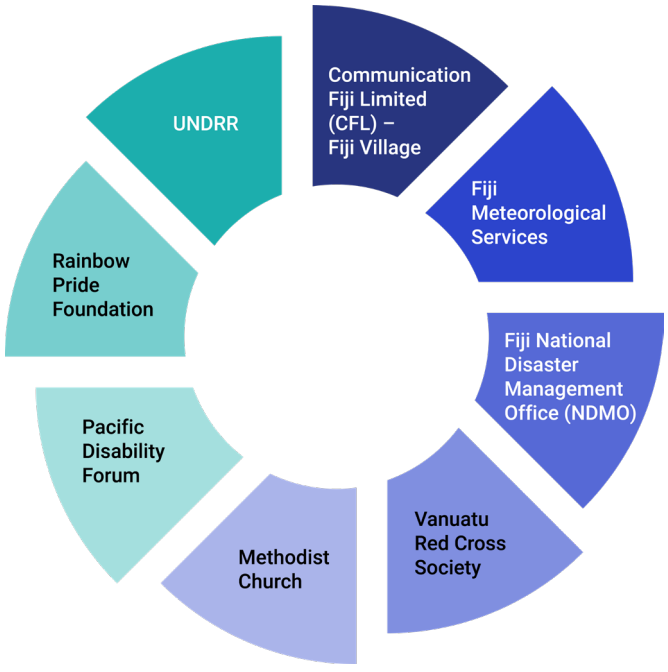
Target communities were carefully selected to include the community environment (urban/rural and coastal/inland), ethnic groups (Fijian and Indo-Fijian, but not others) and their recent exposure to hazards were each considered in the approach. Over two weeks in May 2022, a total of 36 consultations were conducted with the target groups listed in Table 1. The field consultation team led the community consultation process, using structured questionnaires. The target population informants were mobilized by the community chiefs, church groups and other organizations working with women, older persons and persons with disabilities.

Table 1. Locations of the community consultation and the target groups

Type of community	Consulted communities	Women's group	Community members (groups)	Persons with disabilities (individuals)	Older persons (Individuals)	Village chief/local government	Church leader
Urban	Narewa (Fijian)	1			3		1
	Suva (Indo-Fijian)	1	1	1	2		1
Rural	Nadogoloa (Fijian)	1	1	1	1	2	1
	Nawajikuma (Fijian)	1	1				
	Korotale (Indo-Fijian)	1	1	2		1	
Coastal	Qoma (Fijian)	1		3	2	1	
	Kulukulu (Indo-Fijian)	1		1	1		1
Total		7	4	8	9	4	4

KIIs: KIIs were organized to get in-depth insights from the stakeholders working to improve EWS. KIIs were conducted with the following organizations in April and May 2022:

Figure 3. Organizations engaged for KIIs



1.4. LIMITATIONS

Due to COVID-19-related entry restrictions and time limitations, field data collection could only be conducted on one island of Fiji, and not with the other Pacific Island countries (field consultation was also not possible in the other outlying islands of Fiji). The planned consultation with the Kiribati, Samoan and Tongan diasporas living in Fiji was also unfeasible.

The consultation could not reach all planned groups in all locations; however, an additional three consultations with community members were conducted for UNDRR's Anticipatory Action initiative which also focused on EWS. While it was intended to interview youth/young women, most of the surveyed were young mothers and adult women as the younger generation were attending schools at the time of the consultation. For KIIs, the research team identified and contacted several key informants (NDMO/ National Meteorological and Hydrological Services [NMHSs], disability organizations, media, etc.). Not all responded, limiting the number of interviews.

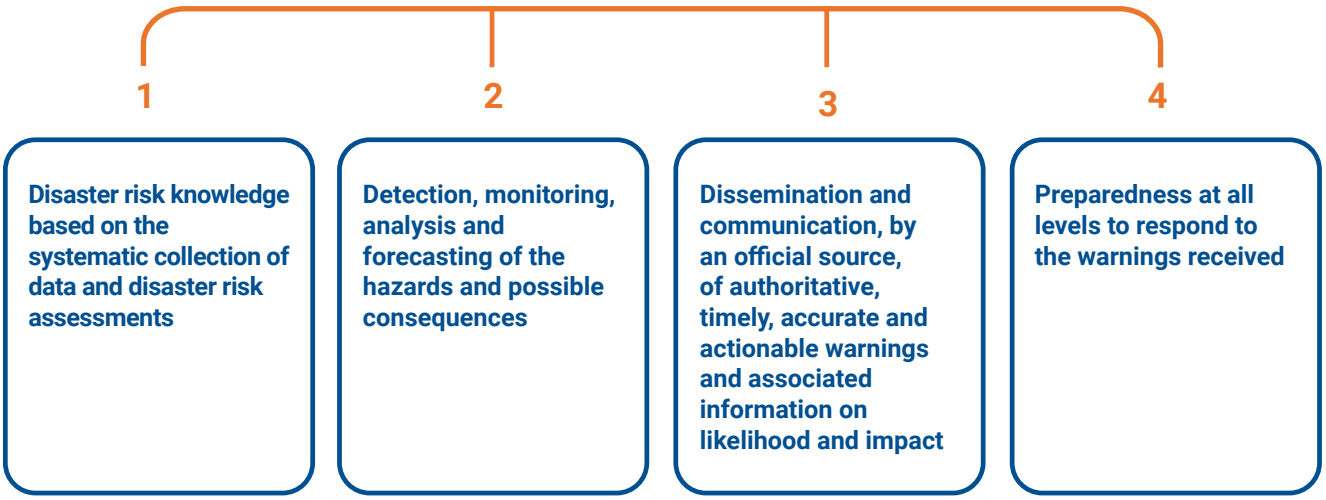
1.5. INTRODUCTION TO THE TERMINOLOGY USED IN THIS REPORT

Early warning is an integrated system of hazard monitoring, forecasting and prediction, disaster risk assessment, communication and preparedness activities, systems and processes that enable individuals, communities, governments, businesses and others to take timely action to reduce disaster risks in advance of hazardous events.[8]

Effective end-to-end and people-centred EWS include four interrelated key elements (see Figure 4).

These four interrelated components need to be coordinated within and across sectors and multiple levels for the system to work effectively and to include a feedback mechanism for continuous improvement.

Figure 4. Four elements of effective EWS



8 A/71/644.

Early action covers the activities that any individual or organization could implement in response to a forecast or early warning, before a hazard has occurred, in order to reduce the impact. These could range from refreshing volunteer and staff training, to strengthening houses or distributing cash or other supplies to help vulnerable populations prepare for and cope with the immediate aftermath of an extreme event.[9] It highlights a shift in conceptualization from reactive emergency response to prevention through clear transmission of potential impact of an incoming hazard.

MHEWS address several hazards and/or impacts of similar or different types, occurring alone, simultaneously, in a cascade or cumulatively over time, and taking into account potential interrelated effects. A MHEWS with the ability to warn of one or more hazards increases the efficiency and consistency of warnings through coordinated and compatible mechanisms and capacities, involving multiple disciplines for updated and accurate hazards identification and monitoring for multiple hazards.[10]

Persons with disabilities include those who have long-term physical, mental, intellectual or sensory impairments which, in interaction with various barriers, may hinder their full and effective participation in society on an equal basis with others.[11]

Gender refers to the social attributes and opportunities associated with being male and female, and the relationships between women and men and girls and boys, as well as the relations between women and those between men. These attributes, opportunities and relationships are socially constructed and are learned through socialization processes. They are context- and time-specific and changeable. Gender determines what is expected, allowed and valued in a woman or a man in a given context. In most societies, there are differences and inequalities between women and men in responsibilities assigned, activities undertaken, access to and control over resources, as well as decision-making opportunities. Gender is part of the broader sociocultural context. Other important criteria for sociocultural analysis include class, race, poverty level, ethnic group and age.[12]

9 Anticipation Hub, "Early action". Available from https://www.anticipation-hub.org/experience/early-action (accessed on 2 May 2023).
10 A/71/644.
11 United Nations, *Convention on the Rights of Persons with Disabilities* (2006). Available from https://www.un.org/development/desa/disabilities/convention-on-the-rights-of-persons-with-disabilities/convention-on-the-rights-of-persons-with-disabilities-2.html (accessed on 2 May 2023).
12 United Nations, Office of the Special Advisor on Gender Issues and Advancement of Women, "Gender mainstreaming: Strategy for promoting gender equality", August 2001.

02

ENSURING EARLY WARNING SYSTEMS REACH THOSE MOST AT RISK


Credit to UNDRR

Pacific SIDS are home to a rich and diverse range of indigenous cultures, languages, traditions and practices that have been sustained for centuries. For thousands of years, traditional and local knowledge played a critical role in understanding the risks, cultivating sustainable livelihoods, and preparing for and responding to climate and disaster risks in the Pacific.[13] The knowledge of past disasters and coping strategies is integrated into the cultures and traditions and passed down from one generation to the next. Women in particular in the Pacific Islands hold valuable traditional knowledge, and their exclusion will result in less robust and equitable climate change programmes and policies.[14]

Local governance structures in the Pacific, such as traditional or chiefly systems, church leaders and representatives from the women's and youth groups, play an essential role in early warning early action. They disseminate warning information to the community members and advise on actions to be taken. However, according to several studies, women, persons with disabilities, and sexual and gender minorities often have limited role in decision-making and discussions on climate change, DRR, EWS or wider development issues.[15] For instance, studies on climate change and traditional knowledge in Vanuatu, found that women, youth and persons with disabilities are largely excluded within the chiefly systems and marginalized in decision-making processes.[17] Research by the Red Cross Red Crescent Climate Centre found that youth in Palau, including those with disabilities, are marginalized and lack confidence and opportunities to engage in early warning early action.[17] A study by the Pacific Disability Forum demonstrated how climate change is impacting the lives and livelihoods of persons with disabilities in the Pacific and exacerbating the existing exclusionary practices.[18] Women with disabilities face additional barriers in accessing resources and opportunities to ensure food security. Oxfam Australia found that people with diverse SOGIESC were largely marginalized and excluded from DRR and humanitarian relief efforts in the aftermath of the tropical cyclone (TC) Winston in Fiji.[19] Other studies also confirmed that people with disabilities and people with diverse SOGIESC were discriminated against and excluded from humanitarian and protection coordination mechanisms following TC Pam in Vanuatu, TC Gita in Tonga and flash floods and TC Liua in Solomon Islands.[20] There is limited research on the impacts of climate and disaster risks on people with diverse SOGIESC in the Pacific.

The intersection of gender, disability and poverty creates a set of challenges and discrimination which often puts women and girls at higher risk during disasters.[21] Due to structural discrimination, stigma, and inequalities certain individuals and groups are more susceptible to the impacts of climate and disaster risks, facing greater risks of losing lives, dwellings, safety and livelihoods. There is a tendency to categorize certain groups as "vulnerable", however, in reality, individual characteristics, social, cultural, economic and political structures, and the environment intersect and overlap, making individuals or groups in certain situations particularly susceptible to disasters, sometimes with multiple cascading effects. The differences in impacts are not necessarily immediate, although sometimes they are. They can also arise from different needs not being met in the early warning and early action.

Intersectionality is an analytical framework that helps understand how an individual's multiple characteristics together connect or intersect to create identity and interactions with power.[22] Intersectionality recognizes that people's lives are shaped by their identities, relationships and social factors.[23] There is an urgent need to explore the intersections between indigenous people, traditional knowledge, and gender as it relates to climate vulnerability and adaptation.[24]

15 Emily Dwyer and Lana Woolf, *Down by the River: Addressing the Rights, Needs and Strengths of Fijian Sexual and Gender Minorities in Disaster Risk Reduction and Humanitarian Response* (Melbourne, Oxfam Australia, 2018). Kate Sutton and others, *Protecting People in Locally Led Disaster Response* (Melbourne, Australian Red Cross and Humanitarian Advisory Group, 2019). Sascha Fuller, Margaret Alston and Nikita Kwarney, "Gender equality, disability and social inclusion (GEDSI) considerations for the Climate Information Services for Resilient Development in Vanuatu (Van-KIRAP) Project", final report (Newcastle, Australia, University of Newcastle, 2021). Available from https://www.sprep.org/sites/default/files/vankirap/Van%20KIRAP_Gender%20Assessment_Final%20Report.pdf.
PDF, *Disability and Climate Change in the Pacific: Findings from Kiribati, Solomon Islands, and Tuvalu* (Suva, 2022). https://pacificdisability.org/wp-content/uploads/2022/08/PDF-Final-Report-on-Climate-Change-and-Persons-with-Disabilities.pdf.

16 Granderson, "The role of traditional knowledge in building adaptive capacity for climate change".
Fuller, Alston and Kwarney, "Gender equality, disability and social inclusion (GEDSI) considerations for the Climate Information Services for Resilient Development in Vanuatu (Van-KIRAP) Project".

17 Viliamu Iese and others, *Community-based Early Warning Early Action (EWEA) in the Pacific: Findings from Palau* (The Hague, Red Cross Red Crescent Climate Centre, 2022).

18 PDF, *Disability and Climate Change in the Pacific*.

19 Dwyer and Woolf, *Down by the River*.

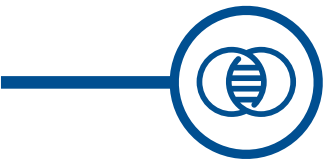
20 CARE Australia, *Tropical Cyclone Gita, Kingdom of Tonga, Rapid Gender Analysis: Sub-focus on Shelter and Food Security and Livelihoods* (Canberra and Melbourne, 2018).
Sutton and others, *Protecting People in Locally Led Disaster Response*.

21 Sanjay Srivasta and others, *Resilience in a Riskier World: Managing Systemic Risks from Biological and Other Natural Hazards. Asia-Pacific Disaster Report 2021* (Bangkok, UNESCAP, 2021).

22 Kimberle Crenshaw, "Demarginalizing the intersection of race and sex: A black feminist critique of antidiscrimination doctrine, feminist theory and antiracist politics", University of Chicago Legal Forum, No. 1 (1989).
CARE Australia, *Tropical Cyclone Gita, Kingdom of Tonga, Rapid Gender Analysis: Sub-focus on Shelter and Food Security and Livelihoods* (Canberra and Melbourne, 2018). Sutton and others, *Protecting People in Locally Led Disaster Response*.

23 UN Women and United Nations Partnership on the Rights of Persons with Disabilities, *Intersectionality Resource Guide and Toolkit: An Intersectional Approach to Leave No One Behind* (New York, 2022).

24 McLeod and others, "Raising the voices of Pacific Island women to inform climate adaptation policies".



Applying the intersectional lens in climate information and EWS could lead to deeper understanding of how the four elements of the EWS can interact and can reduce or reinforce the vulnerability of certain individuals and groups, in particular for:

1. DISASTER RISK KNOWLEDGE

- Local hazards may not be known to people who are very young, new to an area, speak a different language, or use specific communication channels such as sign language or braille.
- People may not be aware of their own and others' vulnerabilities due to age, gender, disability, poverty or their physical location.
- People may accept socially assigned roles in disaster and not consider the associated risks for each group.

2. DETECTION, MONITORING, ANALYSIS AND FORECASTING OF THE HAZARDS AND POSSIBLE CONSEQUENCE

- Some people may not learn from previous patterns or may put more weighting on previous experiences, even if hazards have changed since then.
- Community-based warning systems may not be tailored to the specific needs of women working at home, farmers, fishers or persons with disabilities.
- Scientific forecasting and monitoring may not always consider the local and traditional ways of observing and forecasting weather events.

3. WARNING DISSEMINATION AND COMMUNICATION

- Not all people own communication devices such as televisions, radios or phones, or have access to the Internet, as these may be too expensive for some people, or people may live in areas with poor network coverage, especially on small outer islands in the Pacific.
- Not all warning information is available in formats accessible to all. Foreign languages, local dialects, pictures, pictograms, sign language, text messages, audio message and maps should be contextualized to each community.
- Community loudspeakers and sirens may not be well maintained or may not have back-up power to allow them to work properly during power cuts, and they will not be heard by people with hearing disabilities.
- Warning information may be difficult to understand.
- People might not know what action is needed.

4. PREPAREDNESS AND RESPONSE CAPACITIES

- People may hesitate to evacuate after receiving warning information as they do not want to lose their daily wages, or consider that they need to protect their livestock and livelihoods first.
- There may be no transportation or money for diesel or transportation to evacuate families, especially frail older persons, small children and babies, or persons with disabilities.
- Evacuation centres may not be designed for persons with disabilities, older persons or children, or sometimes may be seen as unsafe places for women and girls, and people with diverse SOGIESC to stay.
- Cultural practices and traditions may define how women, men, children, people with diverse SOGIESC and older persons can decide and act on their own.

Achieving the first mile of EWS requires a wide range of actions which certainly goes beyond what NDMOs/NMHSs alone can change. It depends more on how country plans and community-driven processes address marginalization and exclusion issues through development plans and actions. Reducing marginalization and exclusion in EWS can be best achieved through applying both a mainstreaming approach and a targeted approach across the EWS process and beyond.

A human rights-based approach (HRBA) can also help to reach the first mile by ensuring the participation of diverse groups in discussions, decision-making and design of accessible and usable EWS by all persons. As outlined in this section, women, youth, persons with disabilities, older persons as well as people with diverse SOGIESC face numerous challenges and are excluded from participation and decision-making at different phases of disasters and early warning value chain. HRBA ensures that duty bearers and government agencies that issue warnings have a clear duty to ensure that the warning reach all who are affected in a timely and understandable manner, and that rights holders and community members have a responsibility to hold duty bearers to account for the provision of warning. The United Nations Environment Programme (UNEP) further suggests that HRBA can help warnings to reach the first mile by asking a set of questions: Who has been left behind? Why? Who has the duty or responsibility do something about it? And what is needed to take an action? When HRBA is implemented properly, policies and actions will promote equal access to early warnings and enable participation of diverse groups in the discussions and decision-making. HRBA will also facilitate a people-centred approach to EWS rather than a hazard-centred approach.[25]

Credit to UNDP

25 Mushfig Habilov and others, *Early Warning as a Human Right: Building Resilience to Climate-related Hazards* (Nairobi, UNEP, 2015).

Credit to UNDP

03

POLICY REVIEW: INTERNATIONAL, REGIONAL AND NATIONAL POLICY FRAMEWORKS

- International policy frameworks
- Regional policy frameworks
- Findings from the desk review requiring field verification

Credit to UNDRR

3.1. INTERNATIONAL POLICY FRAMEWORKS

The Sendai Framework for Disaster Risk Reduction 2015–2030 prescribes gender and disability inclusion in DRR frameworks. Recognizing the different capacities of countries about data collection and reporting, the indicators for the Sendai Framework Monitor encourage reporting of sex, age, disability and income disaggregated data,[26] but this is not mandatory.[27] Despite its intention, the lack of obligation to report on sex, age and disability disaggregated data, it may have created a culture of non-consideration of gender, age and disability issues in DRR.

There is also often a missing link preventing concrete results across various efforts made on inclusion in DRR. For example, the Dhaka Declarations on Disability and Disaster Risk Reduction (2015 and 2018)[28] and the Incheon Strategy to "Make the Right Real" for Persons with Disabilities in Asia and the Pacific (2012)[29] highlighted the importance of recognizing the exclusion of persons with disabilities and other vulnerable groups in DRR, and to set globally or regionally agreed indicators to measure disability inclusion in DRR. These indicators are not always linked or used in project formulation in DRR, resulting in limited investments for its realization. Similarly, the WMO's *Multi-Hazard Early Warning Systems: A Checklist* provides a comprehensive set of guidance on programme development, including consideration of intersectionality.[30] However, limited evidence was found on how this document has been promoted and used during the elaboration of EWS programmes.

The use of gender and age markers, such as the Inter-agency Standing Committee (IASC) Gender with Age Marker and the European Commission Gender-Age Marker, is increasingly a donor requirement in the humanitarian setting.[31] Many other aspects of existing guidance on gender equality in DRR also remain unused,[32] including those on the prevention of gender-based violence in emergency shelters, and general recommendation No. 37 of the Committee of the Convention on the Elimination of All Forms of Discrimination Against Women (2018).[33] These guidelines and checklists are too often limited to showing "what has to be done", without explaining or showing how to do it.

Finally, the Convention on the Rights of Persons with Disabilities, in particular article 11 on situations of risk and humanitarian emergencies, as well as the guidance provided by the Committee to countries on its implementation, are of significance. Significantly, the Committee is in the process of developing a general comment on article 11, which will contribute to defining the scope of its application, hence relevance for disability-inclusive EWS.

26 Mary Picard, *Beyond Vulnerability to Gender Equality and Women's Empowerment and Leadership in Disaster Risk Reduction: Critical Actions for the United Nations System* (New York and Geneva, UN Women, UNFPA and UNDRR, 2021).
27 UNDRR, "Sendai Framework Monitor: Gaps and current needs", presentation, 28 October 2020.
28 International Disability Alliance, "Bangladesh Second World Conference on Disability and Disaster Risk Management", 23 May. (2015). The declaration was endorsed during the 2017 Global Platform for Disaster Risk Reduction.
29 UNESCAP, "Incheon Strategy to 'Make the Right Real' for Persons with Disabilities in Asia and the Pacific, and Beijing Declaration, including the Action Plan to Accelerate the Implementation of the Incheon Strategy", policy brief (Bangkok, 2019).
30 WMO, *Multi-Hazard Early Warning Systems: A Checklist* (Geneva, 2018).
31 Globally, over 11,000 project applied the GAM in 2020, and 89 per cent of all European Union humanitarian aid integrated gender and age consideration.
IASC, "Gender with Age Marker (GAM) 2020 completion", 10 December 2020.
European Commission, "Gender- and age-sensitive aid: Factsheet". Available from https://civil-protection-humanitarian-aid.ec.europa.eu/what/humanitarian-aid/gender-and-age-sensitive-aid_en (accessed 15 June 2022).
32 Some other sources include:
International Federation of Red Cross and Red Crescent Societies, *The Responsibility to Prevent and Respond to Sexual and Gender-based Violence in Disasters and Crises* (Geneva, 2018).
CARE International and others, "The GBV Accountability Framework: All humanitarian actors have a role to play", 15 May 2019.
Call to Action on Protection from Gender-Based Violence in Emergencies. Available from https://www.calltoactiongbv.com (accessed on 5 May 2023).
Global Shelter Cluster, "GBV in Shelter Programming Working Group – documents". Available from https://sheltercluster.org/group/9027/documents (accessed on 19 May 2023).
33 United Nations, *Convention on the Elimination of All Forms of Discrimination against Women* (2018).

3.2. REGIONAL POLICY FRAMEWORKS

The Framework for Resilient Development in the Pacific: An Integrated Approach to Address Climate Change and Disaster Risk Management (FRDP): 2017–2030 is high-level voluntary policy guidance to enhance resilience to climate change and disaster in the Pacific region.[34] A guiding principle for FRDP is the effective participation of persons with disabilities, children, youth and older persons in the planning and implementation of activities. The Framework has identified strengthening MHEWS as a key priority action for national and subnational governments, regional organizations and private sectors, and encourages early warning language and messages to be accessible to all, especially for vulnerable people.

The Asia-Pacific Action Plan 2021–2024 for Implementation of the Sendai Framework for Disaster Risk Reduction 2015–2030 aims to accelerate risk-informed development by treating risk reduction as a cross-cutting theme and increasing investments in prevention, risk reduction, climate change adaptation and anticipatory approaches.[35] The Action Plan emphasizes the principle of social inclusion and identifies action points needed at the regional, national and local levels to promote inclusive DRR strategies and actions, strengthen impact-based end-to-end EWS, and integration of traditional and indigenous knowledge in resilience-building. The Action Plan further identifies inclusive collection and analysis of disaggregated risk, climate change and disaster impact data as priority action, and calls for making risk information and warnings publicly available in formats that are accessible for children, women, persons with disability, older persons, migrants and ethnic minorities.

The Pacific Framework for the Rights of Persons with Disabilities 2016–2025 is a regional framework to support Pacific governments to promote, protect and fulfil the rights of persons with disabilities.[36] The Framework recognizes that the persons with disabilities and other vulnerable groups face higher risk of death and injury on the account of their exclusion from DRR policies, plans and activities. It identified the inclusion of persons with disabilities in climate change adaptation measures and disaster risk management policies and plans as one of its primary goals. The Framework promotes the development of regional guidelines for disability-inclusive disaster risk management plans, and awareness of disability-inclusive climate change resilience programmes and disaster risk management plans.

The Pacific Platform for Action on Gender Equality and Women's Human Rights 2018–2030 is a road map for achieving gender equality and enhancing the well-being of women and girls; supports actions on national, regional and international gender equality commitments made by the Pacific Island countries and territories; and guides Pacific Island countries and territories, regional agencies and development partners in prioritizing strategic approaches to achieve gender equality.[37]

The Platform outlines the challenges in achieving gender equality in the region and provides a set of strategic objectives and actions for implementation.

34 SPC and others, *Framework for Resilient Development in the Pacific: An Integrated Approach to Address Climate Change and Disaster Risk Management (FRDP), 2017–2030* (Suva, SPC, 2016).
35 UNDRR, *Asia-Pacific Action Plan 2021–2024 for the Implementation of the Sendai Framework for Disaster Risk Reduction 2015–2030* (Geneva, 2021).
36 Pacific Islands Forum Secretariat, *Pacific Framework for the Rights of Persons with Disabilities: 2016–2025* (Suva, 2016).
37 SPC, *Pacific Platform for Action on Gender Equality and Women's Human Rights 2018–2030* (2017).

The Pacific Islands Meteorological Strategy 2017–2026 sets out strategic context and direction for strengthening NMHSs in the Pacific Islands. It seeks to promote development through building capacity within NMHSs, and ensures that support is coordinated and effectively delivered in partnership with governments, international agencies and regional organizations, donors, and technical partners. One of the guiding principles for implementation of the Strategy is supporting the empowerment of women, young boys and girls, people living with disabilities, and vulnerable groups. NMHSs are committed to increasing the engagement of these groups in the development, communication, and implementation of their services. They recognize the importance of women as sources of information, including traditional climate knowledge, and as users of information for the benefit of communities. The Strategy identifies national and regional priority actions that would enhance the public weather services through engaging and understanding the specific needs and requirements of users, including women, children and vulnerable communities; tailoring services and public education to users/community needs; and improving presentation and usefulness of public weather services.[38]

While regional policies and strategies on gender, disability, climate and disaster resilience, and meteorology identify inclusion of diverse and vulnerable groups in disaster preparedness and EWS as key priority actions, the implementation of them at the national and local levels remain a challenge. This is due to the limited financial, human and technical capacities to implement specific actions at the local level. There is also limited evidence of how national governments are implementing and monitoring the progress of the regionally identified priorities and actions.

3.3. NATIONAL POLICY FRAMEWORKS

Countries in the Pacific have national climate change and DRR laws, policies, strategies and action plans with different levels of scope, complexity and comprehensiveness. These national policies and strategies acknowledge that women, children, persons with disabilities, older persons and other marginalized groups are disproportionately affected by climate change and disaster risks. They encourage equal opportunities and participation of diverse groups in policy development, decision-making and implementation of DRR. Yet several reports,[39] post-disaster needs assessments (PDNAs) and gender analysis following TC Pam (2015),[40] TC Winston (2016),[41] TC Gita (2018)[42] and TC Harold (2020),[43] and the COVID-19 pandemic, found that women and persons with disabilities were either excluded from or had limited influence in decision-making. Similarly, people with diverse SOGIESC experienced exclusion and discrimination in the aftermath of disasters in Fiji, Tonga, Solomon Islands and Vanuatu.[44] Their specific needs, priorities and experiences are not fully reflected or referenced in the national policies and plans on DRR and EWS. Despite their commitments, governments and other humanitarian actors have small budget allocations and human resources dedicated to advancing disability inclusion.[45]

38 SPREP, *Pacific Islands Meteorological Strategy 2017–2026: Sustaining Weather, Climate, Water and Ocean Services in Pacific Island Countries and Territories* (Apia, 2017).

39 SPC, *Pacific Platform for Action on Gender Equality and Women's Human Rights 2018–2030*.
Fuller, Alston and Kwarney, "Gender equality, disability and social inclusion (GEDSI) considerations for the Climate Information Services for Resilient Development in Vanuatu (Van-KIRAP) Project".
Humanitarian Advisory Group and others, *Organisations of Persons with Disabilities: Making a Difference in Vanuatu and Solomon Islands* (Melbourne, Humanitarian Advisory Group, 2022).
PDF, *Disability and Climate Change in the Pacific*.
UNDRR, *Disaster Risk Reduction in the Kingdom of Tonga: Status Report* (Geneva, 2022).

40 CARE International, "Rapid gender analysis, Cyclone Pam, Vanuatu", 7 April 2015.

41 Live & Learn Fiji and CARE International, "Rapid gender analysis, Tropical Cyclone Winston, Fiji", March 2016.

42 CARE Australia, *Tropical Cyclone Gita, Kingdom of Tonga, Rapid Gender Analysis*.

43 Megan Williams, *Rapid Gender Analysis of Tropical Cyclone Harold* (Melbourne, CARE Australia, 2020).

44 Dwyer and Woolf, *Down* by the River.
Sutton and others, *Protecting People in Locally Led Disaster Response*.

45 Humanitarian Advisory Group and others, *Organisations of Persons with Disabilities*.

Despite widespread international evidence that the impacts of climate change and disaster events often negatively affect women and gender minorities more than men, attention to gender equality as a concept is still in its early stages in the Pacific, and although recognized in some policies and project designs, it is not well-supported by on-the-ground actions or well-monitored.[46] There are national policies and strategies that promote gender equality; however, they have limited gender context analysis, and limited funding and personnel to implement practical actions. This leads to the conclusion that little attention is being paid to the importance of examining social dynamics and the root causes of vulnerability and unequal distribution of risk.[47]

Strengthening effectiveness of the climate services and EWS were identified as priority actions in majority of the Pacific SIDS's Nationally Determined Contributions to the Paris Agreement, as well as in their Joint National Action Plans on Climate Change and Disaster Risk Management. NMHS and NDMOs, along with other sectoral national agencies, play a key role in implementing these commitments.

A review of the NMHS Strategic Plans that are available online found that upgrading systems and observation networks, enhancing data management, and strengthening staff capacities were the main priority actions. While the Strategic Plans highlight the importance of working together with other government departments and sectors, few of them mention the need to work with local communities. The research did not find standard operating procedures or plans that outline how NMHS or NDMOs are involving women, persons with disabilities, children and older persons in designing, managing and implementing community-based EWS.

Limited information was available on EWS across these national-level policy documents,[48] and few countries described the commitment to measure the impacts and effectiveness of EWS periodically, or to engage communities directly. Apart from a few publications,[49] intersectionality has not been sufficiently analysed, and neither have the specific questions of whether the EWS is reaching vulnerable individuals and to what extent it triggers anticipatory actions.[50] In-depth analysis on EWS and intersectionality is generally missing.

3.3.1. Disaster risk knowledge

The *Global Assessment Report on Disaster Risk Reduction* 2022 notes that societies have more data about risks than ever before, which enables the development of tools and services that reduce climate and disaster risks.[51] However, without a sound understanding of risks and meaningful participation in discussions, local stakeholders and communities cannot make informed decisions on early warnings and disaster response. The literature review conducted for this study has found that Pacific countries have conducted many hazard-specific risk assessments, hazard mapping, vulnerability and impact assessments with the support of the Council of Regional Organisations in the Pacific (CROP), such as the Pacific Community (SPC), the Secretariat of the Pacific Regional Environment Programme (SPREP) and bilateral international partners. Community-based and disability-inclusive disaster management tools[52] have been developed to provide practical approaches on how to engage communities, especially persons with disabilities in the hazard, vulnerability and capacity assessments. While risk assessment tools are available, their application is not a requirement for development planning and implementation, which results in development activities that do not address hazard-related risks and vulnerabilities, according to the TC Winston PDNA.[53] As disaster risk information initiatives were largely driven by projects and international and regional organizations, there is limited evidence on how effectively these risk assessment tools have been used by the national governments after the projects ended.

46 IPCC, *Climate Change 2022*.
47 Picard, *Beyond Vulnerability to Gender Equality and Women's Empowerment and Leadership in Disaster Risk Reduction*.
48 Only Kiribati and Tuvalu provided detailed descriptions of EWS. The documents of other countries which have been mentioned are not available online.
49 Sarah Brown and others, *Gender Transformative Early Warning Systems: Experiences from Nepal and Peru* (Rugby, United Kingdom, Practical Action, 2019).
50 United Nations International Strategy for Disaster Reduction, *Living with Disability in Disaster: UNISDR 2013 Survey on Living with Disabilities and Disasters – Key Findings* (Geneva, 2014).
51 Jenty Kirsch-Wood and others, *Global Assessment Report on Disaster Risk Reduction. Our World Risk: Transforming Governance for a Resilient Future* (Geneva, UNDRR, 2022).
52 Fiji Disabled People's Federation and PDF, *Fiji Disability Inclusive Community Based Disaster Risk Management Toolkit* (Suva, 2013).
SPC, "Palau community based disaster risk reduction toolkit", September 2016.
53 Live & Learn Fiji and CARE International, "Rapid gender analysis, Tropical Cyclone Winston, Fiji".

While community-based DRR toolkits are very comprehensive, they contain limited samples of exercises and approaches to be implemented by the local communities to engage persons with disabilities. There is a gap in knowledge and lack of specific guidance on the involvement of organizations of persons with disabilities (OPDs) in preparedness and response.[54] Modifications of this content could transform these guides allowing them to be more accessible to all, or make them more actionable tools. As an example, the Women's Resilience Index of the Economist Intelligence Unit contains a comprehensive set of questions, encompassing economic, infrastructure, social and institutional domains which are highly relevant to be reflected in DRR gender analysis.[55] This includes questions directly related to EWS, and also assesses education level, usage of communication technologies, social mobility, migration patterns, capacity, access, decision-making of women and the perceived roles of media, and its analysis could inform EWS design. Figure 5 shows questions which can be developed using the Women's Resilience Index and are directly related to EWS.

Figure 5. Questions developed from the Women's Resilience Index

- Did you know about existing warning systems in advance?
- Do you trust these warnings and act when you receive them?
- Do you know if a shelter/safe exists for people to seek refuge?
- Is this shelter accessible? Do you feel safe staying there?
- If you received an early warning, would you go to the shelter?
- Do you rely on traditional or local knowledge for preparing, coping with and responding to a disaster?
- Do you know what to do during a disaster? Have you received training?
- Is there a disaster management plan at the community level?

54 Humanitarian Advisory Group and others, *Organisations of Persons with Disabilities*.
55 The Economist Intelligence Unit, *The South Asia Women's Resilience Index: Examining the Role of Women in Preparing For and Recovering From Disasters* (London, New York, Hong Kong and Geneva, 2014).

Engaging local stakeholders and communities in risk assessments will improve understanding of their exposure and vulnerability to risks, acknowledge their needs and priorities, and incorporate their local and traditional knowledge about risks. Communities in the Pacific Islands hold valuable local, indigenous and traditional knowledge, and have long been adapting to changes to their environment,[56] and have as a consequence developed local coping capacities.[57] Traditional knowledge refers to knowledge that has been transmitted intergenerationally within a particular cultural community, primarily through oral means: stories, songs, rituals, memories, experiences and skills, including practical demonstration of agricultural practices.[58] Pacific Islanders have adapted to weather extremes and several sea level changes over centuries through a range of mechanisms, including communal pooling of resources, food and water storage, elevated settlements, and rituals for predicting climatic and environmental variability.[59]

The literature review found many examples of disaster risk knowledge that have been shared and are practised by women, men and persons with disabilities who use traditional knowledge for timing harvesting, food preservation, and protecting their houses and farmland.[60] For instance, people used traditional knowledge to identify signs of drought in Tuvalu and took actions to preserve water.[61] Communities in Vanuatu, Fiji and Tonga use similar traditional warning signs – observing nesting behaviours of bees and hornets, other behaviour changes in particular birds or animals, and changes in currents, tides and wind direction – to monitor tropical cyclones.[62] There are also numerous accounts that members of older generations, who have experienced previous disasters, have effectively used traditional knowledge to observe weather patterns, animal behaviours and plants to detect hazards and alert their families and communities. At the same time, it is acknowledged that recent extreme weather events are more intense than before, and there could be instances where traditional knowledge and past experiences also carry a danger of creating a false sense of safety. The incorporation of local and traditional knowledge into warning systems has been recommended to increase perceptions of reliability,[63] and improve local communities' understanding of climate and disaster risks and address their vulnerabilities that can result in successful community initiatives.[64]

Credit to Pacific Disability Forum

56 Kelman, Mercer and West, "Combining different knowledges".
57 Anna Gero, Kirstie Meheux and Dale Dominey-Howes, "Integrating community based disaster risk reduction and climate change adaptation: Examples from the Pacific", Natural Hazards and Earth System Sciences, vol. 11 (2011).
58 Pierce and Hemstock, "Cyclone Harold and the role of traditional knowledge in fostering resilience in Vanuatu".
59 Granderson, "The role of traditional knowledge in building adaptive capacity for climate change".
60 Dhrishna Charan, Manpreet Kaur and Priyatma Singh, "Indigenous Fijian women's role in disaster risk management and climate change adaptation", *Pacific Asia Inquiry*, vol. 7, No. 1 (2016).
Viliamu Lese and others, Community-based Early Warning Early Action (EWEA) in the Pacific: Findings from Tuvalu (The Hague, Red Cross Red Crescent Climate Centre, 2022).
Pierce and Hemstock, "Cyclone Harold and the role of traditional knowledge in fostering resilience in Vanuatu".
61 Lese and others, Community-based Early Warning Early Action (EWEA) in the Pacific: Findings from Tuvalu.
62 Ingrid Johnston, "Traditional warning signs of cyclones on remote islands in Fiji and Tonga", Environmental Hazards, vol. 14, No. 3 (Fall 2015).
Fuller, Alston and Kwarney, "Gender equality, disability and social inclusion (GEDSI) considerations for the Climate Information Services for Resilient Development in Vanuatu (Van-KIRAP) Project".
63 Johnston, "Traditional warning signs of cyclones on remote islands in Fiji and Tonga".
64 Gero, Meheux and Dominey-Howes, "Integrating community based disaster risk reduction and climate change adaptation".

3.3.2. Detection, monitoring, analysis and forecasting

During the past decade, there has been significant investment in the weather-, climate-, hydrological- and ocean-related capacity and infrastructure in the Pacific region, which has resulted in improvement in the capacity and capabilities of NMHSs according to the feasibility report Weather Ready Pacific – A Decadal Program of Investment (2021). However, the report also found that critical gaps remain in governance arrangements, mandate and strategic plans; that the ability to invest in and maintain modern observational infrastructure is limited; computational infrastructure and capacity is not up to global standards; forecasting systems in use are highly variable in approach and quality; and there are insufficient qualified meteorological and technical staff available to develop and deliver accurate, localized and impact-based forecasts and warnings.[65] Similar institutional and technical challenges in establishing MHEWS were identified in another report by the Indonesian Agency for Meteorology, Climatology and Geophysics (BMKG) and the United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP).[66] This indicates that sustainable and robust investments are needed in enhancing all aspects of MHEWS in the Pacific, including governance arrangements, observation networks and infrastructure, risk information and communication, and capacity-building of NMHS staff to provide impact-based end-to-end warning services to communities.

The Intergovernmental Panel on Climate Change (IPCC) *Sixth Assessment Report* showed in 2022 that while progress has been made in the areas of detection, monitoring, analysis and forecasting of severe weather systems, there is a need to strengthen these areas for other climate-related hazards such as wildfires, intense localized rainfall, floods, heatwaves and droughts. In the 2021 State of the Climate in the South-West Pacific report, the majority of the surveyed WMO Members reported of having inadequate forecasting and warning services for localized riverine flood, flash flood and droughts. In fact, the majority of NMHS in the Pacific prioritized upgrading observation networks, enhancing hazard detection and monitoring, and generating impact-based forecasting as priority actions in their Strategic Plans.[67] There is limited reporting on the status of EWS in the Pacific, as the investments were fragmented, project-driven and hazard-specific. More data from the Pacific SIDS are needed to have a full picture of the capacity of EWS within the region.[68]

Impact-based forecasting or predicting what may be the impact of a given hazard, is an emerging service being provided by NMHS agencies. According to WMO, it will be a paradigm shift for NMHS to move from providing information on what the weather will be, to what the weather will do, which aims to effectively trigger early action based on warnings.[69] Indeed, while providing scientifically accurate forecasting is important, it is also critical to communicate the potential impacts and consequences of the forecasted hazard on people, their livelihoods and assets, which will enable people to take appropriate early actions. Recent studies by the Red Cross Red Crescent Climate Centre found that most people in Tuvalu preferred "action" information as part of an early warning when drought was forecasted, and respondents in Palau reported that lack of clear understanding of the severity of typhoons and lack of awareness on what to do and when to act delayed early action when responding to typhoons.[70]

There is a growing interest from the NMHS and NDMOs in Fiji, Samoa, Solomon Islands and Tonga to implement impact-based forecasting and weather services (IBFWS), which has been supported through capacity-building efforts by the World Bank, WMO and CROP agencies. WMO has developed Guidelines on Multi-hazard Impact-based Forecasting and Warning Services to support its members to develop their forecast and warning services in a manner that allows the consequences of extreme weather hazards to be fully understood by users, and appropriate mitigating actions to be undertaken.[71] While these guidelines provide useful recommendations and successful examples of how to target and engage diverse groups, including children, older persons and persons with disabilities, IBFWS is still in the early stages of implementation in the Pacific, and further work is needed in the design, communication and dissemination of impact-based warning services to reach diverse groups.

65 Pacific Meteorological Council, "Weather ready Pacific – A decadal program of investment", April 2021.
66 Asteria S. Handayani and others, "Strengthening multi-hazards early warning system in the Pacific through BMKG-UNESCAP collaboration pilot projects", *MATEC Web of Conferences*, vol. 229 (2018).
67 WMO, *State of the Climate in the South-West Pacific* (Geneva, 2021).
68 Cullmann and others (eds.), *2020 State of Climate Services*.
69 Ibid.
70 Lese and others, *Community-based Early Warning Early Action (EWEA) in the Pacific: Findings from Tuvalu.*
71 Gerald Fleming and others, *WMO Guidelines on Multi-hazard Impact-based Forecast and Warning Services* (Geneva, WMO, 2015).

Limited information was available on how countries in the Pacific are measuring the effectiveness of their existing warning services, as well as their investments in all four elements of EWS. Recognizing the importance of measuring the effectiveness of EWS, Multi-hazard Early Warning Systems Custom Indicators & Methodologies for Computation was developed by WMO and UNDRR to measure the progress of implementing MHEWS.[72] The custom indicators measure the effectiveness of MHEWS via the Sendai Framework Monitor and focus on the performance of the four elements of EWS with governance and gender- and disability-inclusion aspects of EWS. Similarly, the United Nations Educational, Scientific and Cultural Organization and the Intergovernmental Oceanographic Commission, through their Tsunami Ready Recognition Programme supporting coastal community preparedness, have developed a set of indicators to meet a standard level of tsunami preparedness.[73] These tools are developed to support NMHS and NDMOs to measure the effectiveness and inclusiveness of their existing EWS.

Limited research has been conducted on the cost-benefit analysis of EWS in the Pacific region. Research by Fakhruddin and Schick attempted to demonstrate that investing in early warning services can produce benefits and avoid losses and damages in Samoa. They analysed data from the PDNA of Cyclone Evan that hit Samoa in 2012, and found that investing more in early warning services will enhance resilience and lessen the impact on infrastructure, property, lives and livelihoods when cyclone strikes. The research identified opportunities to strengthen the efficiency of EWS in Samoa by investing in the capacities of NMHS, enhancing accuracy of forecast lead time, and investing in pre-impact assessment of DRR.[74] According to Rogers and Tsirkunov, cost-benefit analysis of EWS must consider the overall operational costs of the system, and the societal and economic losses due to false alarms and the societal and economic savings due to timely action.[75] Further cost-benefit analysis research on EWS in the Pacific is needed.

There are good practices on EWS led by women's organizations in the Pacific,[76] such as Women's Weather Watch in Fiji, Meri Gat Pawa, Meri Gat Infomesen in Papua New Guinea, and Women Wetem Weta in Vanuatu. These initiatives not only provide valuable insights for inclusive, accessible and effective EWS, but also demonstrate the added value of women-led approaches for promoting gender equality and empowering women. It would be helpful to evaluate in detail the effectiveness and efficiency of these initiatives, particularly among the most marginalized women (displaced, ethnic minorities, etc.), prior to scaling up in other countries. These good initiatives have not yet been fully incorporated in national policies, thus limiting the scale to outreach.

As outlined in this section, there have been substantial investments in monitoring, detection and observation networks and infrastructure in the Pacific. However, these investments have been largely fragmented and project-/donor-driven. Enhanced governance arrangements and coordination structures at the regional and national levels will ensure that investments in EWS are targeted, needs-based, and regularly monitored. It will also ensure that warnings are impact-based, end-to-end and tailored to the specific needs of diverse groups.


Credit to Unsplash/Alec Douglas

72 UNDRR, WMO and CREWS, Multi-hazard early warning system custom indicators & methodologies for computation (Geneva).
73 Intergovernmental Oceanographic Commission, "Tsunami Ready Programme". Available from https://ioc.unesco.org/our-work/tsunami-ready-programme (accessed on 9 May 2023).
74 Bapon Fakhruddin and Lauren Schick, "Benefits of economic assessment of cyclone early warning systems – A case study on Cyclone Evan in Samoa", *Progress in Disaster Science*, vol. 2 (July 2019).
75 David Rogers and Vladimir Tsirkuov, *Global Assessment Report on Disaster Risk Reduction: Cost and Benefits of Early Warning Systems* (Geneva and Washington, D.C., United Nations International Strategy for Disaster Reduction and World Bank, 2010).
76 UNDRR, *Inclusive and Accessible Multi-Hazard early warning Systems. Learning from Women-led Early Warning Systems in the Pacific* (Geneva, 2022).

3.3.3. Warning dissemination and communication

According to WMO (2020), only 49 per cent of its members provide products and services (through television, radio, SMS, online applications, etc.), and of these, only 29 per cent use the Common Alerting Protocol (CAP) for disseminating warnings.[77] CAP is a standard message format for all hazards and all media communications. CAP provides consistency in the information delivered over multiple systems and compatible with all kinds of public alerting information systems, including broadcast radio, television and data networks for all types of hazards. WMO developed Guidelines for Implementation of Common Alerting Protocol (CAP)-Enabled Emergency Alerting and is assisting NMHS in the Pacific to develop or enhance their CAP standards.[78] There are good examples of implementing CAP in the region. For instance, NMHS in Tonga and Solomon Islands have improved dissemination of warning by using CAP and incorporating it into standard operating procedures.[79] In Vanuatu, NMHS and Red Cross have further developed a combination of visual and impact descriptions for each of the different cyclone categories, linking the alert scales with the impacts of the weather.[80]

It is widely acknowledged that EWS must have multiple channels to disseminate warning messages. How people receive and act on the warning messages depend on multiple factors, including their age, gender, health, disability, educational level, past experience, and physical, social and environmental factors. Given the population spread across the remote and geographically dispersed islands and limited communication infrastructures, reaching the "first mile" with end-to-end and inclusive warning messages continues to be challenging in the Pacific. The existing communication channels and languages may exclude certain individuals and groups, including people living with hearing disabilities, people with lower literacy levels and/or difficulty in reading, and those living in poverty from receiving warning information. Remote communities may have limited access to television, radio or network coverage, and may need to use alternative channels such as community loudspeakers, sirens or word of mouth. Studies and PDNAs have shown that communities in the Pacific largely rely on word-of-mouth networks that include village heads, chiefs, church leaders, women's groups and family/community members for receiving warnings.[81] For instance, Women's Weather Watch provided daily weather watch updates through a network of rural women leaders to ensure that the voices, needs and priorities of women and other vulnerable groups were considered in humanitarian assistance during TC Winston.[82]

It is also recognized that maintaining siren and loudspeaker systems is expensive, and that these methods of EWS also do not reach people with hearing loss. There are emerging examples of using new technologies such as drones and mobile satellite communication system to reduce communication blackspots and to make EWS more accessible and resilient to communication breakdown.[83] The price of these technologies is expected to continue to fall. In addition, solar-powered energy kiosks are expected to support equity in access to energy among the most marginalized.[84]

Understanding the risk information and warnings is another challenge in ensuring early action. The PDNAs following TC Winston in Fiji[85] and TC Pam in Vanuatu[86] found that public understanding of the characteristics of a category 5 system and associated risks were inadequate, which led to poor preparation and decision-making in relation to evacuation and sheltering. The language used in warning messages is critical for understanding and actioning by users. For instance, a PDNA after TC Pam in Vanuatu recommended the translation of the warning messages into Bislama or other native local languages to make it easier for people to understand and act on warnings.

77 Cullmann and others (eds.), *2020 State of Climate Services*.
78 WMO, *Guidelines for Implementation of Common Alerting Protocol (CAP)-Enabled Emergency Alerting* (Geneva, 2013).
79 Handayani and others, "Strengthening multi-hazards early warning system in the Pacific through BMKG-UNESCAP collaboration pilot projects".
80 Becky-Jay Harrington, *People Centered Early Warning Systems: Learning From National Red Cross and Red Crescent Societies (Geneva, International Federation of Red Cross and Red Crescent Societies*, 2022).
81 Fuller, Alston and Kwarney, "Gender equality, disability and social inclusion (GEDSI) considerations for the Climate Information Services for Resilient Development in Vanuatu (Van-KIRAP) Project".
Iese and others, *Community-based Early Warning Early Action (EWEA) in the Pacific: Findings from Palau*.
82 UN Women Fiji, "Women responding to Tropical Cyclone Winston", UN Women Fiji Snapshot (Suva, 2016).
83 Jon Brodkin, "An AT&T drone is now providing cellular service to people in Puerto Rico", Ars Technica, 11 June 2017.
Docomo, "Telecommunications carriers and the Eighth Regional Coast Guard headquarters conduct joint training on portable mobile base stations", 10 October 2018 (in Chinese). Available from https://www.docomo.ne.jp/info/notice/chugoku/page/181015_00.html.
84 UNEP, *Powering Equality: Women's Entrepreneurship Transforming Asia's Energy Sector* (Bangkok, 2020).
85 Fiji, *Post Disaster Needs Assessment: Tropical Cyclone Winston*, February 20, 2016 (Suva, 2016).
86 SPC, *Tropical Cyclone Pam: Lessons Learned Workshop Report* (Suva, 2015).

Credit to UNDRR

Persons with disabilities face additional barriers to receive warnings in accessible formats. A 2022 study by the Pacific Disability Forum highlighted that warning information is not designed or delivered in a way that reaches individuals with disabilities, and particularly those who are deaf, blind or having visual impairment, or with intellectual or psychological disability. A PDNA following TC Harold and the COVID-19 response in Vanuatu showed that just over half of persons with disabilities could access information about a cyclone through their social network, and only 22.8 per cent of children received information through school.[87] These findings illustrate the importance of improving access to first-hand climate information and warnings in accessible formats by diverse groups. This requires recognition and embracement of diversity and understanding of individual needs of different groups when designing EWS.

A great example of effective and inclusive risk communication for persons with disabilities was developed by the Pacific Disability Forum (PDF) in response to the COVID-19 pandemic. Guidelines on disability-inclusive communication and messaging were developed to show various ways to communicate with persons with disabilities recognizing the different impairments. These guidelines provide recommendations to governments, media, caregivers and other actors involved in the COVID-19 response on specific ways to communicate risks to persons with a variety of disabilities. For instance, the guidelines recommended that authorities broadcast through television or video in order to use sign language; that the information and warnings should be in clear and easy-to-read formats; and that the risk information to be available in braille and large fonts not less than 18 size font.[88] This exemplifies that disability inclusion requires understanding of different types of disabilities, and designing the products and services tailored to their specific needs. These recommendations could be easily incorporated into the risk communication strategies and warning messages for other hazards as well.

The COVID-19 pandemic also provided effective examples of developing common warning information globally, including a set of different warning information messages in multiple formats (video, voices, pictograms, songs, cartoons, braille, etc.) to reach all community residents of different ages, functionalities, literacy levels and languages. For instance, the Human Rights and Anti-Discrimination Commission in Fiji in collaboration with the United Nations Development Programme worked with Fijian Broadcasting Corporation to use sign language interpreters to make the critical information on COVID-19 on Fijian television accessible to people with hearing and speaking impairments. The universality of the need to disseminate the same information to all audiences without contextualization may explain the fast application of the COVID-19 common message.

Another good example on inclusive risk communication was demonstrated by the Fiji Disabled People's Federation. They established an emergency operations centre in 2018, acting as a hub for the dissemination of warning information. Once warning information was received from NDMO and NMHS, the staff and volunteers cascaded warning information to OPDs working with communities, using communication guidelines for the most suitable communication platforms and methods specific to each OPD such as sign language, video conference, phone calls or SMS messages.

National and local media play a fundamental role in DRR, especially in the early warning value chain, to deliver critical information to different audiences. They are also increasingly engaged in public awareness-raising and education on climate and DRR. The media in the Pacific countries closely collaborate with national authorities before, during and after disasters to broadcast advisories, warnings and critical information on evacuation centres, essential services and assistance, through television, radio and social media. CROP agencies such as SPC and SPREP have also been building capacities of media representatives in the Pacific on how to effectively communicate topics on climate change, disaster risks and other related issues. While the media is engaged in different phases of disasters, the risk communication and messaging are not always tailored for persons with disability, especially those who have visual, hearing and cognitive impairment. The media needs to be part of discussions on national disaster preparedness plans, and actively engage in the design and implementation of people-centred EWS.

87 Vanuatu, Department of Strategic Policy, Planning and Aid Coordination, *Post-Disaster Needs Assessment: TC Harold & COVID-19, Vanuatu. Volume A: Summary Report* (Port Vila, 2020).
88 PDF, "Disability inclusive messaging guidelines", Pacific Disability Forum COVID-19 Update, No. COVID-19_PDF_04 (Suva, 2020).

An encouraging initiative is the Asia-Pacific Broadcasting Union's Media for Disaster Prevention Initiative in collaboration with UNDRR, including training for journalists and content-sharing.[89] Such a regional attempt could help Pacific SIDS to benefit from common tools, developing modified warning messages and training on how to disseminate warning messages.

Researchers in the Resilience to Nature's Challenges conducted a study to explore how Pacific communities in Auckland, New Zealand understand potential hazards and respond to them.

The study found that there were four "Rs" related to disaster risk communication, that map across the traditional four Rs of readiness, reduction, response and recovery:

1. **Reach:** the degree to which any communication strategy will get to the person/group of interest
2. **Relevance:** the degree to which any communication is seen as being relevant to the target audience
3. **Receptiveness:** the degree to which engagement is culturally resonant
4. **Relationships:** the way in which two or more people or things are connected, or the state of being connected

The study further elaborated how each of these concepts will ensure that risk information is communicated in effective, inclusive and culturally responsive ways to Pacific communities, and enables meaningful participation in decision-making. The study shows that risk communication strategies should avoid one-size-fits-all approaches and instead consider unique cultural values and protocols, understand the vulnerabilities and experiences of diverse groups, and take into account different communications technologies used by diverse groups.[90]

Making a BCP also helps ensure the continuity of critical infrastructure and communication during and after the disaster. The submarine volcanic eruption in Tonga in 2022 highlighted the fragility of the undersea cable network, which was disrupted by the eruption. The failure of communication infrastructure made it difficult for national response agencies to communicate critical warning information to the communities, especially remote islands. There are no formal and binding agreements between communication providers and the National Emergency Management Office and Tonga Meteorological Services, which could create confusion between roles and responsibilities for disseminating emergency information.[91] Strengthening communication infrastructure, making agreements with communication providers and establishing multiple back-up systems integrated into a BCP will enhance robust communication during emergencies. When communication infrastructure is down, the EWS must be able to be disseminated through other means; however, UNDRR's briefing paper on risk communication of COVID-19 reported that traditional door-to-door campaign among poor, remote or displaced communities was difficult due to physical distancing and related cost requirements.[92]

Risk communication and warning dissemination are fundamental components of EWS and DRR. As highlighted in this section, early warning messages must reach everyone in the community through multiple and trusted communication channels, including traditional ways of communication. The warning messages should be clear and simple to understand, actionable and accessible in multiple formats that will enable appropriate preparedness and response actions by all persons. The communication channels and warning messages should be designed jointly with community members, and tested regularly through disaster preparedness drills and exercises.

3.3.4. Preparedness and response capacities

Effective DRR requires meaningful participation of women, men, children, persons with disabilities, older persons and people with diverse SOGIESC at all levels of disaster risk management, and applies HRBA throughout planning, implementation and monitoring. The national climate change and disaster risk management policies and plans in the Pacific recognize that marginalized groups are disproportionately affected by disasters,

89 Asia-Pacific Broadcasting Union, "ABU launches Media for Disaster Prevention Initiative", 2 May 2021.
90 Jay Marlowe and Andreas Neef, "Church, community and beyond: Effective disaster risk communication with and for Pacific people in Auckland", Resilience to Nature's Challenges, 20 July 2018.
91 Bapon Fakhruddin, "Strengthening emergency communications for complex, cascading and compounding events – lessons learned from the Hunga Tonga-Hunga Ha'apai eruption and tsunami in Tonga", PreventionWeb, 16 February 2022.
92 UNDRR Regional Office for Asia-Pacific, "Risk communication and countering the 'infodemic'", UNDRR Asia Pacific COVID-19 Brief (Bangkok, 2020).

and calls for equal participation in decision-making and implementation of DRR. The Convention on the Rights of Persons with Disabilities calls for countries to ensure protection and safety of persons with disabilities during disasters, armed conflicts and humanitarian emergencies. The Pacific Framework for the Rights of Persons with Disabilities 2016–2025 calls for greater inclusion of persons with disabilities in all aspects of the disaster management cycle, including in the disaster management planning, policy discussions and PDNAs. While existing policy frameworks provide for HRBA and call for national authorities to create an enabling environment for all persons to meaningfully participate in DRR processes, implementing these commitments and actions in reality remains challenging.

Disasters make the situation regarding access to essential services worse for persons with disabilities. PDNAs following major tropical cyclones in the region, including TC Gita, TC Winston, TC Pam and TC Harold found that the needs of persons with disabilities were not met at the evacuation centres. Churches and schools are often used as evacuation centres in the Pacific; they were not always accessible for persons with disabilities, as they lack ramps, bathrooms and facilities that cater for their specific needs. People with psychological and cognitive disabilities faced challenges, as they were less likely to receive timely hazard warnings and make decisions on evacuation and preparedness actions. A report by PDF found that climate change is increasing the negative impacts of the pre-existing exclusion of persons with disabilities from the policy formation and implementation, participation in disaster risk management initiatives, and design of evacuation centres in the Pacific.[93]

Two surveys specially assessing response capacities and preparedness of persons with disabilities (a global survey by UNDRR in 2013 and a Japanese survey in 2021) provide an in-depth analysis, examining the interaction between having disabilities and EWS.[94] Both surveys indicated that a high percentage of persons with disabilities have not participated in community disaster management and risk reduction processes currently in place in their communities, and do not have a personalized plan for preparedness and evacuation. A high percentage of respondents reported not taking action after experiencing an event (due to lack of means to evacuate, inaccessible evacuation centres, discrimination from others, etc.). Their experiences appear to mirror those in the Pacific:

> **"Significant gaps remain in ensuring inclusion of persons with disabilities in humanitarian response in areas of evacuation centres, early warning and accessibility of information, disability disaggregated data and creating awareness about different types of impairments and disabilities including psychosocial disabilities."**
>
> – Pacific Disability Forum[95]

In 2023, UNDRR conducted a 10-year follow-up to a 2013 survey inviting persons with disabilities as well as their caregivers to share their experience of living in disaster prone areas and express their concerns, needs and recommendations. The purpose of the survey is to review whether the 1 billion persons with disabilities living with disaster risk today are more involved in planning and decision-making processes to reduce risk or build resilience than they were in 2015, when the Sendai Framework was adopted. The findings from this survey will be used to influence the remaining seven years of the Sendai Framework's implementation until 2030. It will also help to inform a Mid-term Review which is being carried out by countries, regional organizations and the United Nations.

93 PDF, *Disability and Climate Change in the Pacific*.
94 The UNDRR global survey in 2013 was conducted in 137 countries; from the Pacific region, only two respondents participated in the survey, from Palau and Solomon Islands. The Japan survey in 2021 had 876 respondents.
95 Pacific Humanitarian Protection Cluster, "Disability inclusion in humanitarian preparedness and response workshop" (Suva, 2020).

Evacuation centres often lack gender-segregated facilities and sufficient space, putting certain groups at higher risk. The PDNA following TC Winston identified that sexual violence against women and girls was reported in evacuation centres and domestic violence increased, due to the additional stress during a crisis. People with diverse SOGIESC faced sexual harassment at the evacuation centres following TC Pam in Vanuatu, TC Gita Tonga and flash floods in Solomon Islands.[96] Two reports on Fiji analysed the restricted response and preparedness capacities of women, intersecting decision-making, reliance on natural resources and limited access to land, embedded in the social structure.[97] The same reports also found most evacuation centres were not accessible to people with disabilities, who frequently lack decision-making power and are largely excluded from response activities. However, people with disabilities are increasingly being represented on committees.

Within the very limited literature that has examined SOGIESC issues in DRR,[98] one report collected personal insights from Fiji, reporting that the SOGIESC community was not well informed by warning information.[99] Their major concerns are more related to community rejection, fear of sexual aggression, stigma and discrimination during the evacuation and the recovery phases. Many fears in the Pacific region are amplified by the tendency of some in the faith community to blame SOGIESC communities as the cause of any recent disaster.[100] It has also been noticed that the Pacific SIDS have a high prevalence of violence against women and girls,[101] leading to concerns over safety that may prevent certain groups from fleeing their houses.

Collected good practices highlight that pre-planning and participation are key for successful responses, particularly to reduce vulnerability of the marginalized.[102] To ensure early warning results in early action, it is critical for communities to develop a relevant and effective response plan that reflects the needs of diverse groups and have financial mechanisms that support those actions. Anticipatory action and forecast-based financings are a few tools that could be used at the community level to ensure preparedness measures are in place, including pre-identified warning triggers and pre-arranged financing.

Public education and awareness-raising campaigns on disaster preparedness play an important role in understanding risks, testing warning systems and knowing how to act. When individuals, families and communities are prepared, they have capacities to respond to receive warning information. Applying HRBA in disaster preparedness empowers duty bearers and rights holders to know and claim their rights by giving communities greater opportunities to participate in DRR and shaping and monitoring EWS.[103]

The literature review found that personal safety and access to food, drinking water and other essential supplies at the evacuation centre were main concerns for most of the affected people. If appropriate preparation and adequate resource/supplies were put in place beforehand, this will facilitate better decision-making and early action by all persons affected by natural hazards.

Despite the challenges illustrated in this section, Pacific countries continue making significant progress in disaster preparedness and response, especially at the community level. There are many great examples and lessons learned from the region on how to engage diverse groups, including women, children, persons with disabilities and people with diverse SOGIESC at all stages of the disaster management cycle. Almost all the countries have community-based disaster risk management (CBDRM) policies and programmes that are led by national governments and supported by international, regional and local organizations. The study found that EWS are an integral part of the CBDRM programmes and prioritized by community members and local and national actors in the planning and implementation phases of DRR.

96 Sutton and others, *Protecting People in Locally Led Disaster Response*.
Fuller, Alston and Kwarney, "Gender equality, disability and social inclusion (GEDSI) considerations for the Climate Information Services for Resilient Development in Vanuatu (Van-KIRAP) Project".

97 Charan, Kaur and Singh, "Indigenous Fijian women's role in disaster risk management and climate change adaptation".
Live & Learn and others, "Fiji gender, disability and inclusion analysis: COVID-19, TC Yasa and TC Ana" (Suva, 2021).

98 Brown and others, *Gender Transformative Early Warning System*.
Holly A. Seglah and Kevin Blanchard, *LGBTQIA+ People and Disasters* (London, 2021).
Emily Dwyer, *The Only Way is Up: Monitoring and Encouraging Diverse SOGIESC Inclusion in the Humanitarian and DRR Sectors* (Bangkok, UN Women Regional Office for Asia and the Pacific, 2021).

99 Dwyer and Woolf, *Down by the River*.

100 Picard, *Beyond Vulnerability to Gender Equality and Women's Empowerment and Leadership in Disaster Risk Reduction.*

101 A total of 79 per cent of Tongan, 76 per cent of Kiribati and 72 per cent of Fijian women report being affected by some forms of violence in their lifetime.

102 Disability-inclusive Disaster Risk Reduction Network and CBM, *Disability Inclusive Disaster Risk Management: Voices from the Field & Good Practices* (2013).
Anna Matsukawa and others, "Impact evaluation by propensity score analysis of inclusive disaster drill", *Journal of Social Safety Science*, vol. 35 (2019).

103 Habilov and others, *Early Warning as a Human Right.*

3.4. FINDINGS FROM THE DESK REVIEW REQUIRING FIELD VERIFICATION

The literature review found limited resources and case studies on EWS from certain Pacific countries, including the Cook Islands, the Federated States of Micronesia, the Marshall Islands, Nauru and Niue. There is a possibility that some countries might not have well documented their emerging practices, therefore they have gone underreported. There is limited analysis on interaction between EWS and gender, disability and other demographic, social, cultural and economic vulnerabilities.

- While there are ample global, regional and national policy framework and strategies that prioritize inclusion of vulnerable and marginalized groups in planning and decision-making, women, youth, persons with disabilities, older persons and people with diverse SOGIESC still continue to be excluded at different stages of the disaster management cycle. Further analysis is needed on how to operationalize and implement these policies at the local and community levels.

- There has not been a technically robust investment in the collection of detailed disaggregated data to identify and analyse intersectional vulnerability and how to measure progress on inclusion.

- While there have been significant investments in EWS in the Pacific, critical gaps remain in the governance arrangements and institutional capacity of national governments responsible for issuing warnings. Further analysis is needed to explore how existing policy and regulatory frameworks and institutional arrangements support inclusive and end-to-end MHEWS.

- Gender, disability and social inclusion analysis and approaches have not been sufficiently mainstreamed in the design and implementation of EWS at the national and local levels. This illustrates gaps in inclusive and effective risk communication and lack of warning messages in accessible formats.

- There are limited reports on the how countries are measuring the effectiveness of their existing EWS in the Pacific. It is difficult to measure the efficiency and inclusiveness of warning messages and their reach without sound data and feedback mechanisms. Further analysis is needed on measuring the impact and effectiveness of warning messages on different groups.

- There are good practices and initiatives on disability and gender-inclusive DRR in the region. However, there are limited reports and practical tools on gender-responsive and disability-inclusive EWS with sound evidence. Some good practices are documented but their effectiveness, scale and reach remain unconfirmed. Globally, only a few reports with sufficient sample size have been found reporting on the gender and disability inclusion aspects of EWS.

- OPDs, local women's groups and youth groups play a fundamental role in an EWS value chain. There are many good practices from the region on women-led EWS and guidelines and tools developed by OPDs on disability inclusion. Further support is needed to scale up these initiatives at the national level and across different sectors.

- Persons with disabilities face additional barriers to receiving warnings in accessible formats. Currently, climate information and early warning messages are not designed or delivered in a way that reaches individuals with disabilities, and particularly those who are deaf, blind or have visual impairment, or intellectual or psychological disability. It is important to improve the access to first-hand climate information and warnings of diverse groups by engaging them and co-designing warning services and products.

- Traditional, indigenous and local knowledge is crucial in understanding climate and disaster risks, cultivating sustainable livelihoods, and preparing for and responding to hazard events in the Pacific. Further initiatives on integrating traditional and local knowledge into existing EWS would benefit community-based EWS and enhance trust in warning systems.

- There are limited reports providing cost-benefit analysis of EWS in the Pacific region. Further research in this area will enhance investments in EWS and support decision-making on climate- and DRR-related initiatives.

Credit to UNWOMEN

04

PRACTICE AND PERCEPTION: FINDINGS FROM FIJI

- Disaster risk knowledge
- Warning detection, monitoring, or forecasting of the hazard
- Warning dissemination and communication
- Preparedness and response capacities

Credit to UNDP

This section presents findings from the consultations with seven women's groups, found community groups (mixed group), and individual interviews with persons with disabilities, older persons, chiefs, village heads, and church representatives. The information also reflects KIIs with national authorities, local broadcasting agency and other local stakeholders.

4.1. DISASTER RISK KNOWLEDGE

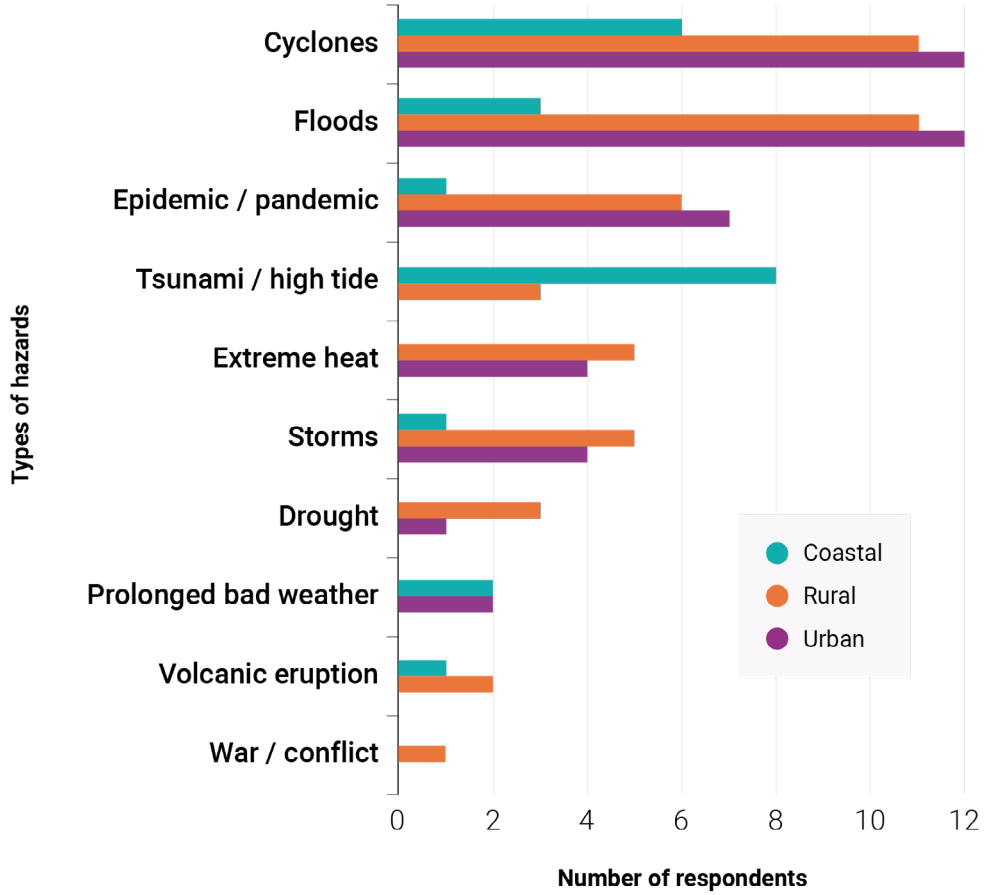
4.1.1. Perceptions of disaster risk knowledge

Overall, the individuals, groups and community members who were consulted had a good understanding of the main disasters they had faced in the past. They knew where hazards are likely to occur, who is likely to be affected, and what impact is most likely to result.

Across all groups, in all locations, cyclones were the most frequently mentioned hazard, followed by floods and the COVID-19 pandemic (Figure 6). All were mentioned with a much higher frequency than any other hazards. Coastal communities tended to focus on cyclones, tsunamis, floods and high tides. One key finding from these consultations was how the participants' education level strongly determined their understanding of risks, likelihood and intensity of specific events, i.e. the impacts of disasters on their lives and livelihoods. The more education people had completed, the better their access to information on hazards, and their ability to access and understand information from different sources in different languages. They were also better in articulating the potential impacts, damage and needs in the aftermath of disasters. Those who had no formal education (those who could not read or write comfortably) relied on informal sources of information such as family and community to seek information on potential disasters. The recent intense cyclones and flooding engraved the risk knowledge and response measures into the population in the Pacific. This may have contributed to overlooking other highly possible and considerably lethal risks such as tsunamis, volcanic eruptions or earthquakes (which in turn would require a completely different set of risk knowledge, preparedness and early actions, even though they may occur at the same time or in close sequence). This reiterates the importance of constantly revisiting and updating risk exposures, even (or especially) if an event has not happened for many years.

> **"People know what to do when disaster strikes. Living with disasters has become a new normal."**
>
> – 87-year-old man in Nawajukuma village, Fiji

Figure 6. Most frequent disasters experienced in the past five years



The respondents had a good understanding of their own vulnerabilities and what type of assistance they might need before, during and after any disasters. Those who had physical or intellectual disabilities, those who were ill, and older persons who lived alone or did not have caregivers, were clearly more vulnerable to disasters because it was not clear how they could receive timely warning information or faced challenges to evacuate. Many expressed a concern that women face difficulties in evacuating safely when water levels are high, noting that their caregiver responsibilities increased their risk.

Specifically, and of concern, people with diverse SOGIESC reported that although they tended not to face difficulty in receiving warning information, their concern was for their safety, and the risk of harassment and discrimination which they reported as being perpetuated during crisis by faith-based organizations.

4.1.2. Post-disaster damage and needs

For persons with disabilities and older persons, evacuation to a safe place was their main concern. Late decision-making and waiting to be evacuated were the main impacts. A lack of psychosocial support for this group was also a main impact after disasters. They expressed concern that they may not be able to understand warning information. Older persons also expressed concerns for their own safety, and the needs for support for their evacuation and for help to access information.

Damage to or loss of housing and the resultant need for shelter were the most frequently mentioned impacts of hazards. Power cuts and water cuts (and the potential risks of waterborne diseases) were also mentioned across most groups and in all locations. The major impacts from disasters were considered to be access to basic services including schools, health centres, transportation, and water and electricity cuts. Some people mentioned the increased responsibility for women and girls; the expectation that they should

take care of their family members and/or secure basic commodities for the family was also noted. Women's groups also listed service disruption, including in medical, transportation and food categories. Some groups were concerned for the safety of children, women, older persons and persons with disabilities. For men, the major concern was destruction of their crops or fields, clearing the mud from their houses and gardens, and road blockages.

Rural and coastal populations were extremely concerned about the direct economic impacts from hazards, such as loss of livestock and crops, damage to plantations, and limited access to fishing. Urban populations were mostly concerned about potential loss of employment.

Finally, the restriction of free movement of women and girls due to insecurity, fear of harassment, disruption of transport and roads, and cultural acceptance was also noted.[104]

4.2. WARNING DETECTION, MONITORING OR FORECASTING OF THE HAZARD

4.2.1 Traditional knowledge for forecasting disasters

Community members emphasized the importance of indigenous and traditional knowledge used to identify and monitor the indicators of potential hazard and communicate them to people. The traditional and indigenous knowledge involves observations of nature's signs, including animal behaviours, atmospheric conditions and plants, to detect potential hazards and respond to disasters. People depend on traditional knowledge that has been passed on for generations. Almost everyone consulted knew at least one or two traditional ways of detecting potential hazards (Figure 7).

Moreover, people in Fiji are aware of the cyclone season (November to April) and know how to prepare for it. Older persons demonstrated broader knowledge on past disasters and experiences, traditional knowledge to observe weather patterns and to warn communities on risks, and knowledge on coping mechanisms. It seems that the younger generation tends to rely on technology for warnings, more than the older generation.

Figure 7. Reported traditional knowledge in Fiji

104 Only 22.2 per cent reported no restrictions on free movement of women and girls.

4.2.2. Community-level monitoring systems

The NMHS is the authorized organization to monitor, forecast and issue warnings. There were no EWS managed by local communities in consulted villages. While there was no or limited official mechanism for EWS users to provide feedback on early warning messages or to share warning signs, community members liaise and communicate with the *Turaga-ni-Koro* or local authorities to receive, clarify and validate warning messages. Only a few people reported they would contact radio stations and share information on any warning signs, or ask questions on warning information.

4.3. WARNING DISSEMINATION AND COMMUNICATION

4.3.1. Communication channels

KIIs confirmed a community-based mechanism of EWS (from district officers to local authorities) has been working very effectively in Fiji, where the local representatives (*Turaga-ni-Koro* and *Mata-ni-Tikina*) and faith organizations play a very important role in disseminating warning information and in evacuating people, often using multiple channels (loudspeakers, phone/SMS, word of mouth, door-to-door warnings, traditional wooden *lali* drums, bells) and issuing updates several times per day.

Community consultations confirmed that people have multiple channels through which to receive warning information. Urban communities have access to more communication channels than rural and coastal communities. Radio, television and phone/SMS are used most frequently, especially in urban communities.

It is significant that the Internet is not mentioned frequently, although this might change in the future, or could be an opportunity to fill in a gap. However, the field consultation team noted that literacy levels, language and the associated socioeconomic status influence access communication channels, with the people with lower literacy level seeming to have lower communication access. Persons with disabilities also tend to have fewer communication channels to receive warning information than other groups, and are heavily dependent on their family/friends to share or translate warning information. Persons with intellectual disabilities rely on their caregivers to understand warning information and take decisions.

Given the size and dispersed nature of the territories in Fiji, there are several reported blackspots for telephone networks and Internet connectivity. This may explain why radio is the most frequently used communication channel to receive warning message among all respondents (followed by television and phone/SMS).

The key stakeholders – Fiji's NDMO, the International Federation of Red Cross and Red Crescent Societies, and PDF – indicated there is a need for improvements to make EWS more accessible.[105] There is a standard format of the warning messages provided for the general public, but none designed for the specific needs of persons with disabilities. A high percentage of persons with disabilities reported not getting warning information directly. People with hearing disabilities who live beyond the reach of television/phone networks often especially depended on indirect sources of information. Supported by the Fijian NDMO, warning information for people with disabilities has been relayed through the emergency operations centre since 2018 in 11 districts.[106]

> **"I live with my grandmother who can't read and write. I depend on her to receive warning information and to make a decision on when and where to evacuate."**
>
> – 18-year-old man who uses sign language

105 Sign language and text captions are broadcast on Fijian national television, and NDMO conferences in Fiji are also accompanied by sign language and captions.

106 Once warning information from NDMO and NMHS is received, the staff and volunteers cascade warning information to OPDs using communications guidelines on the most suitable communication platforms and methods specific to each OPD, such as sign language, video conferences, phone calls and SMS messages.

4.3.2. Access to communication systems

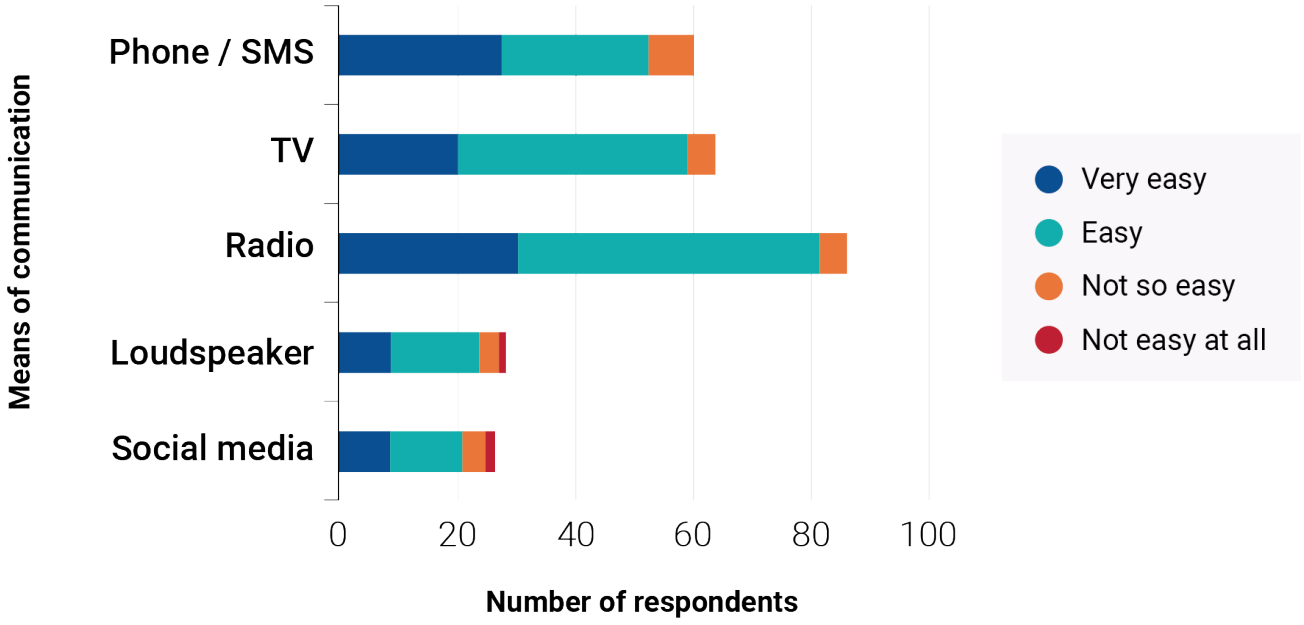
People are concerned about power cuts, network failures and a lack of batteries to run radios[107] for accessing early warning information. Alternatives to produce are wind-up and solar-powered devices. Local government is also concerned that in rural and remote communities the use of Internet is limited due to the low network coverage. In Fijian rural communities the *Turaga-ni-Koro* use loudspeakers or *lali* to warn or make announcements. It is worth noting that in cultural terms, women and girls have equal access to warning information to men, and their difficulty in accessing mobile phones or the Internet derives mainly from financial issues (the high price of devices and data packages) or coverage, rather than societal issues or customs.

4.3.3. Level of understanding of messages

Across all respondents, radio is highly rated for its easiness to understand (easy or very easy), followed by television and phone/SMS. However, the currently available formats of warning information may not be a good fit for some people if they are to understand warning information easily (Figure 8). Those with no access to television or phone/SM, must depend on audio-based information only (radio, loudspeakers, *lali*, etc.), which could present difficulties for persons with hearing disabilities.

KIIs and field consultation revealed that persons with intellectual disabilities are potentially the most marginalized, as they might have difficulty in understanding the warning information itself and how to respond to it. Some respondents noted that warnings and updates on impending hazards that were broadcast through local news channels included sign language, which was helpful for persons with speech impairment.

Figure 8. Ratings of communication channels based on ease of understanding

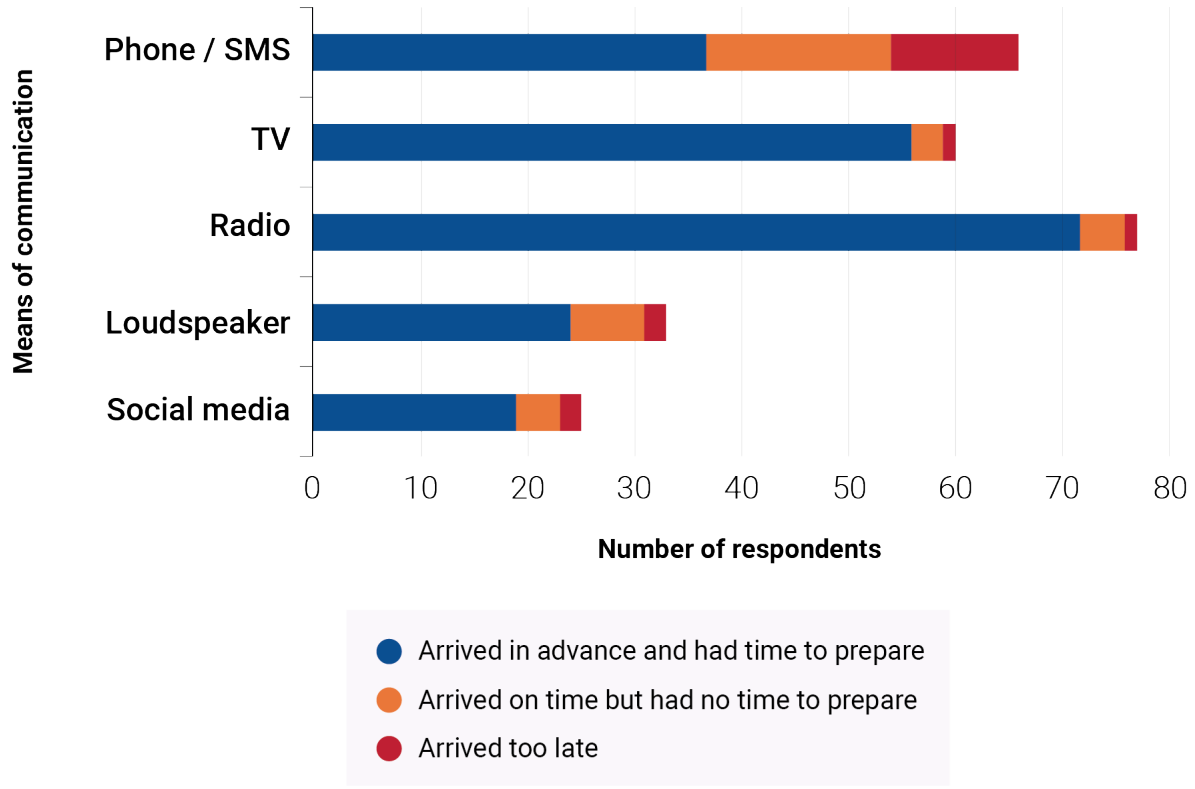


107 A limited number of persons with various disabilities were consulted for this survey, potentially limiting their answers on required support for accessible communication.

4.3.4. Timeliness of warning messaging

Radio is also highly rated for its timeliness. Radio information arrives earlier, and people reported that they had more time to prepare and take actions (Figure 9). The second most timely was television. People are more critical of the timeliness of phone/SMS messaging. A significant percentage (43 per cent) noted that SMS messages arrived on time but left no time to react for specific hazards such as flash floods. Warning through loudspeakers is considered timely in remote places where network coverage is limited.

Figure 9. Ratings of the timeliness of early warning messages

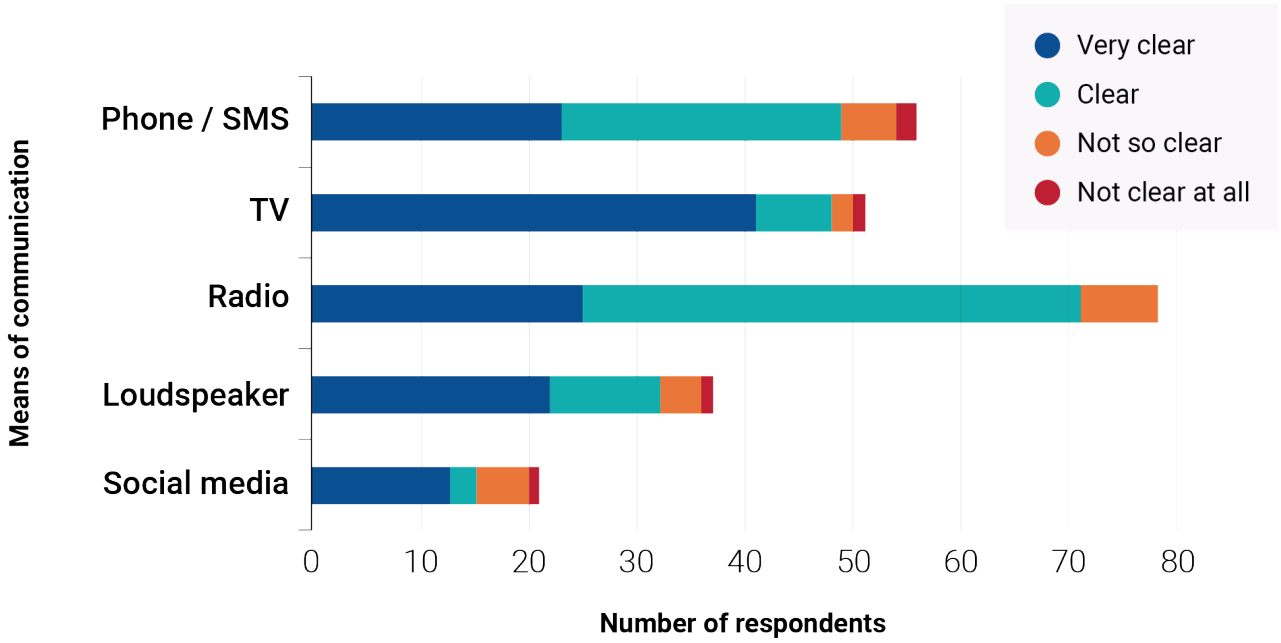


4.3.5. Clarity of warning messaging

Although most respondents commented positively on the clarity of early warning information through radio, 80 per cent marked television with the a "very clear" rating, including sign language and captions. Loudspeakers were marked with the second highest percentage of clarity (59 per cent very clear) as the warning is passed on to community members by *Turaga-ni-Koro*s using vernacular language (Figure 10).

A majority of community members noted that the warning message is not always clear. For instance, it was difficult to understand different categories of cyclones and their potential impact on people and their livelihoods. For instance, if a warning was given on a category 3 cyclone with maximum sustained wind speed of 96–112 knots, it was difficult to understand what the impact would be on people and their livelihoods. This is identified as one of the reasons why people do not take timely action upon receiving a warning. Some warning messages lack impact information and do not provide suggestions for early action, and would thus benefit from further clarification.

Figure 10. Ratings of the clarity of early warning messages




Credit to Unsplash/Miguel A Amutio

4.3.6. Accuracy of information

Radio and television are also highly rated for information accuracy. This contrasts with social media. In an admittedly limited sample, 25 per cent consider information on social media as either not so accurate or not accurate at all (Figure 11).

4.3.7. Usefulness for people to take actions

Most people found that radio, television and phone/SMS are useful in order for people to respond (Figure 12). Phone/SMS is particularly highly rated among women and girls (94 per cent), while they remain critical of its timeliness (see Figure 9). While radio is highly rated, 13 per cent consider it is not so useful or not useful at all for people to take actions, indicating radio information may not be sufficient to trigger prompt early action among its listeners.

Figure 11. Ratings of the accuracy of warning messages

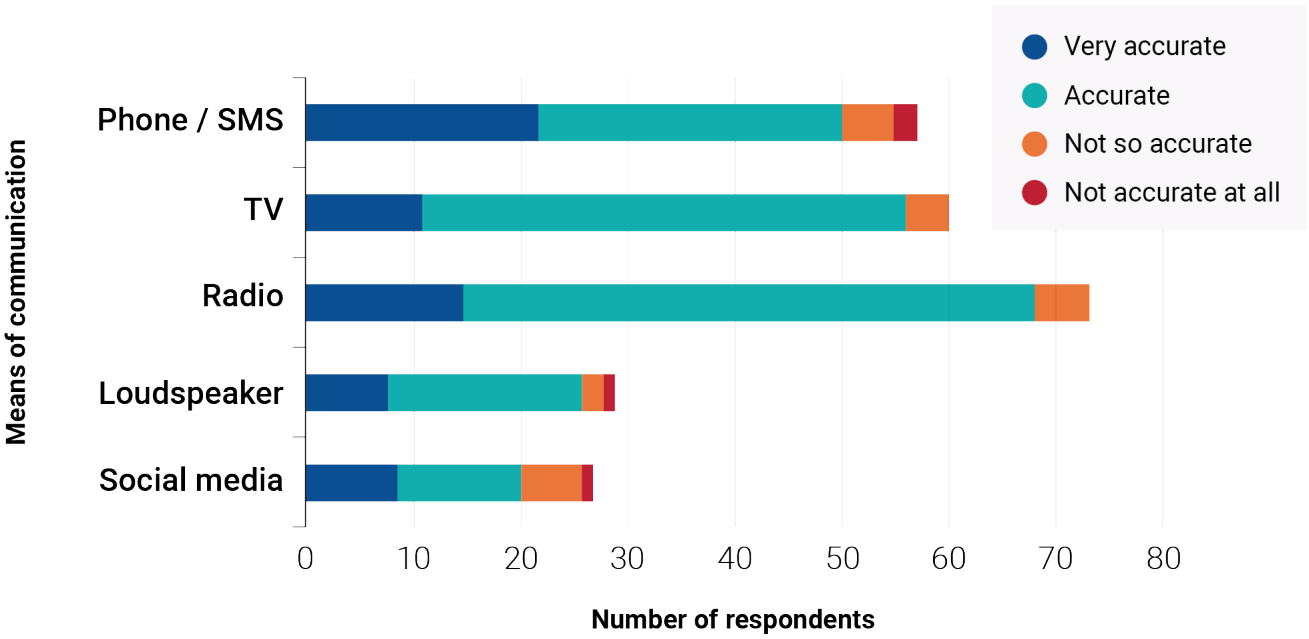
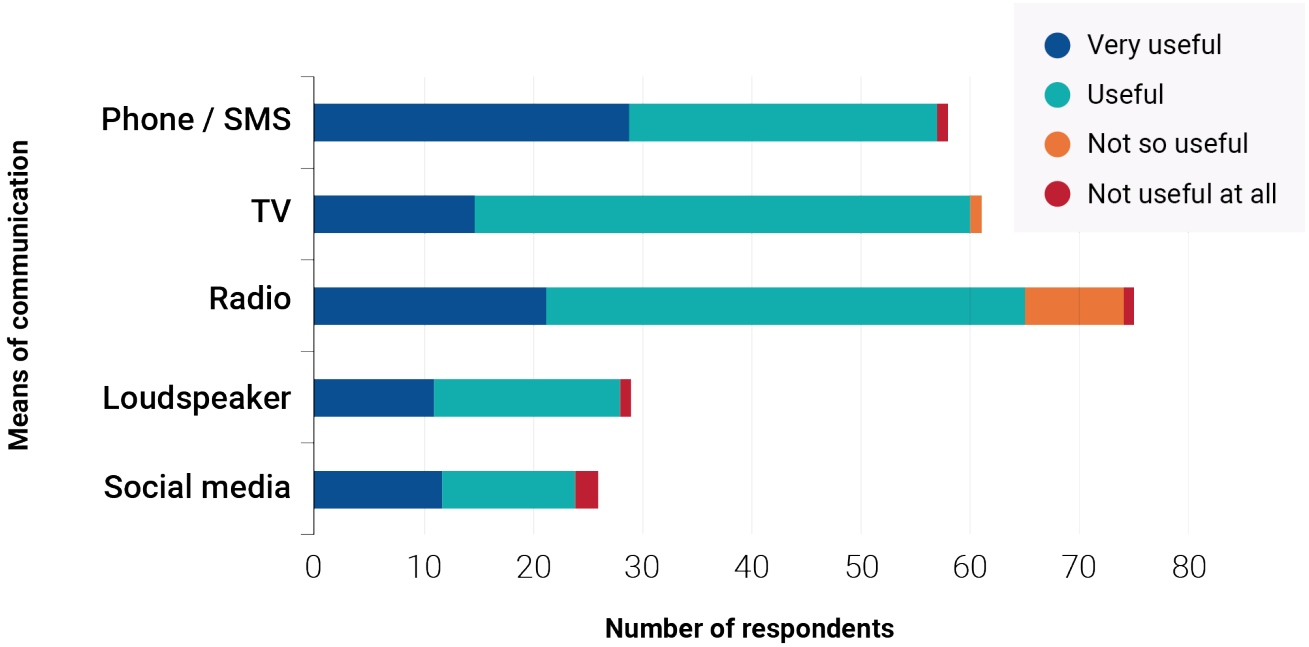


Figure 12. Ratings of the usefulness of warning messages



4.3.8. Level of trust for specific channels

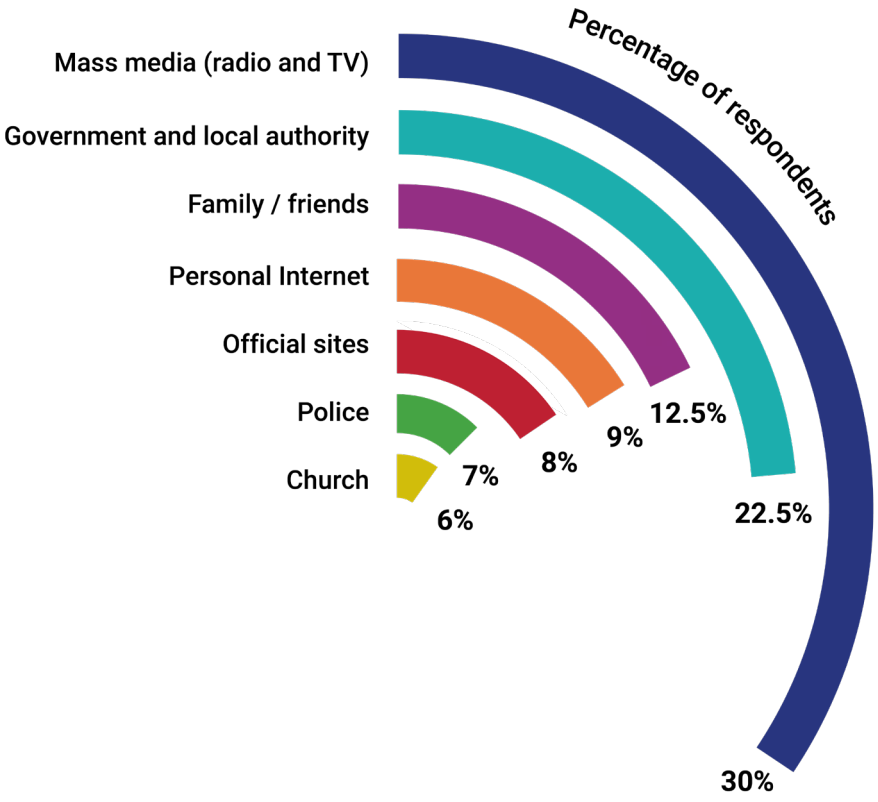
Mass media, specifically national radio and television, are the most trusted warning information source (96 per cent). Most people regard this as the most effective way to reach people, followed by national/local authorities (70 per cent) (Figure 13). Community chiefs and church representatives tend to trust public/official information sources. Official announcements from radio are considered as the most effective among the persons with disabilities, who also rated word of mouth as an effective way of communication for them (42 per cent). They also requested receiving "easy-to-understand" information.

The majority of the respondents noted that they prefer easy-to-understand and actionable warning messages in local languages. Some respondents emphasized that image-orientated information would help children and persons with disabilities to understand the content. Fewer are in favour of receiving audio-based information.

Media plays an important role in disseminating warning information and building risk knowledge, particularly radio, given the dispersed nature of territories. Media can help the national authority to develop easy-to-understand messaging in partnership with communities and community-based organizations.

One of the interviewed local broadcasting companies in Fiji operates 24/7, broadcasts in three languages (iTaukei, Hindi and English) and covers all the outer islands. The well-established partnership with the NMHS facilitates their access to timely and accurate warning message which they broadcast on hourly basis. They play a connecting role between local authorities and affected communities to provide further information on warnings, evacuation centres and availability of relief items, as the station has hotline for their recipients. The broadcasting company emphasized the need for stronger coordination among key national authorities and media, especially during and after the events; the need for localized, simplified and actionable warnings; and capacity-building for media on disaster preparedness. Further interviews with the mass media could provide more information on the accessibility of the warning messages for people who might use different communication methods.

Figure 13. Ratings of the trustworthiness of sources of information



4.4. PREPAREDNESS AND RESPONSE CAPACITIES

Respondents emphasized that disaster preparedness should be prioritized through community-based disaster preparedness initiatives and drills which could also leverage existing networks to enhance EWS. Consulted village heads, community chiefs and church representatives described their current community-based early warning arrangements for disseminating warnings as effective. Meanwhile, they highlighted the importance of preparedness plans, trainings and drills to enhance community early action and preparedness practices.

4.4.1. Decision-making

In rural communities, the *Turaga-ni-Koro* (village head) calls for a village meeting to inform people about any potential hazard, and advises them on whether an evacuation is needed. However, where and when to evacuate is decided at the household level. Most women's groups reported that they decide and act on their own after receiving the warning message. Persons with disabilities would wait for the decisions of their families or community chiefs to evacuate.

> **"Women have the knowledge and wisdom to prepare for disasters and take proper preparedness actions."**
>
> – Indo-Fijian coastal community

Credit to UNDRR

> **"Women respect traditions, but during disasters they act independently in order to protect their family and their livelihoods."**
>
> – A community chief of a rural Fijian community

However, a smaller percentage of women themselves, as well as community members, believe women are at risk of waiting for their male family members to evacuate or make decisions together.

> **"Some women wait for their men (husband, father or brother) to decide whether they should evacuate or not. Men know when it is safe to evacuate and when it is safe to stay home."**
>
> – Indo-Fijian women's group in rural community

4.4.2. Early action

The field consultation confirmed that people take mitigating measures and prepare for an incoming disaster after receiving initial warning information. However, persons with intellectual/cognitive disabilities and some older persons face difficulties in accessing, understanding and acting on warning information. Although they might receive warning information, they may not be able to translate it into actionable information, and cannot decide to evacuate unless instructed by their caregivers or family members. All surveyed persons with disabilities reported that they need assistance to evacuate or take preparatory actions. Respondents also highlighted that pregnant woman, women with small children, female-headed households and older persons will need transportation to evacuate.

The field consultation also highlighted that people are more informed on their response actions, rather than prevention and mitigation actions for each individual hazard. While some high-risk hazards in the Pacific may be difficult to prevent, however, there are certainly effective mitigation measures which require further planning.

Most older persons and persons with disabilities reported the need for support for evacuation after receiving warning information, and that they depend on their families to take them to a safe place. Both groups confirmed a supportive community environment, and that they believe that in general communities are willing to offer help/support to them. Community members commented that they know where people with special needs live. During disasters, young people go out and look for people in need of assistance, which is a common practice in communal settings in Fiji.

> **"I always prefer staying home during a disaster. I feel safe at home."**
>
> – 61-year-old Indo-Fijian woman with speech difficulty

> **"We know everyone in our village. We know where persons with disabilities or older person live, and we understand that they need support during disasters. Young people go from house to house to help those in need, especially persons with disabilities."**
>
> – Women's group in coastal Fijian community

People with diverse SOGIESC reported that they usually do not go to evacuation centres after receiving warning information, in fear of discrimination and harassment.

4.4.3. Resources for early action

There are emerging initiatives of allocating resources in Asia, especially pre-arranged financing for early action, releasing a dedicated fund to take preventative actions, evacuation or for quick relief before the disaster strikes.[108] Such a resource allocation is also an emerging initiative in the Pacific. However, in the consulted communities, there were no particular practices reported on pre-arranged financial resources at the household and community levels.

Within the limited sample,[109] a higher percentage of persons living with disabilities mentioned a lack of required support for their evacuation, particularly in communication. Some women require transportation for safe evacuation and sometimes need make chaperones to support their evacuation.[110] Apart from transportation, women and girls did not report any lack of support or resources.

108 Association of Southeast Asian Nations, *ASEAN Framework on Anticipatory Actions in Disaster Management* (Jakarta, 2022).
109 Less than 50 per cent of the persons with disabilities answered this question.
110 A total of 56 per cent of the groups mentioned that they have needed male chaperones for their evacuation, while only 11 per cent said that there was no need of a male chaperone.

4.4.4. Simulation exercises and planning

NDMOs regularly conduct tsunami siren tests to verify the functionality of the system and improve public readiness for a tsunami. Simulation exercises are mostly community-driven, often supported by civil society organizations (CSOs) and national governments. Only one coastal community described a simulation exercise in collaboration with a CSO, while others either did not participate in any such exercise or there was no such an exercise.

> **"Indo-Fijian communities respond to disasters differently compared to iTaukei communities. iTaukei Fijians tap into their communal experience and resource; they evacuate together and help one another. We Indo-Fijians evacuate individually."**
>
> – Community representative in rural Indo-Fijian community

Overall, the majority of respondents reported that their local authorities have no plan and neither do their own families, but that they know what to do when a hazard is approaching. Persons with disabilities believe that local authorities do not have specific plans accommodating their needs.

Only one women's group from a Fijian urban community reported being familiar with official plans; however, they had not participated in any simulation exercise as they had been busy at their workplaces. In one community, children had been trained on child-centred DRR for two days in 2021. One local administration said they had been working on standard operating procedures for a disaster.

> **"A non-governmental organization conducted an evacuation drill two years ago. Having regular drills would enhance our village's preparedness capacity."**
>
> – Women's group in coastal community

Faith plays an important role in people's survival and coping strategies during disasters among persons with disabilities. This reliance in spiritual belief during disaster was a common answer across different groups.

> **"I noticed that I could not evacuate and had to take a shelter in place, and so relied on my faith and my belief in God for protection."**
>
> – A person with physical disability in a coastal community

4.4.5. Preparedness

Overall, the respondents described various response actions, including preparing for evacuation, storing water and food, preparing for potential power cuts, and offering counselling. Fewer respondents mentioned mitigating measures (reinforcing houses with ropes, cutting cassava leaves, moving household items to a safe place, installing water tanks, etc.). The respondents could also identify preventative measures, such as training, raising disaster awareness, preparing/coordinating response plans, building seawalls and installing drainage systems. In addition, persons with disabilities reported peer support within their communities, including informing other persons with disabilities, as well as their neighbours in case they need neighbours' help.

The majority of the respondents are aware of evacuation centres in their communities or close to their houses. Only a small number reported that there is no evacuation centre. As designated evacuation centres are public infrastructure such as churches, schools or individual houses, which are not equipped adequately for persons with disabilities, some people with disabilities might decide not to go to them. Furthermore, the SOGIESC community often choose not to go to evacuation centres that are not adequately equipped to accommodate them. Officials in charge of evacuation centre management often lack knowledge about the SOGIESC community, the evacuation centres have no privacy, and toilet and shower facilities must be set up for their usage.

4.4.6. Participation

Across all communities consulted, it seems that persons with disabilities, older persons and children have had limited or no participation in the EWS process. One key informant considered that a gender- and disability-inclusive approach is not yet standard in the Pacific region. While women's involvement had progressed, and more female representation was happening at the community level, it was still hard to secure meaningful participation of women. This was reaffirmed and witnessed during field consultation.[111] While persons with disabilities are increasingly represented in local committees, their safe and meaningful participation remain a challenge, which could potentially result in the disempowerment of persons with disabilities.

4.4.7 Capacities among NDMO/NMHS and CSOs

The consulted CSOs recognized that strong partnerships should be formed with NDMOs/NMHS. They are increasingly working through dissemination, training and advocacy with their government counterparts. For example, the SOGIESC organization (Rainbow Pride Foundation) is closely working with NDMO on community-based disaster preparedness and response.[112]

While the enhanced partnerships with women's organizations, OPDs and organizations for people with diverse SOGIESC such as PDF, Rainbow Pride Foundation and Women Weather Watch are widely acknowledged, CSOs felt that gender and disability inclusion are still not yet mainstreamed in the EWS process. NDMOs/NMHS have limited capacities for recognizing and addressing the different intersectional needs of individuals and communities at the local level. Similarly, despite significant achievements made by CSOs to raise their agenda during discussions on EWS, their technical and operational capacities are still limited, and obstacles remain to scale-up at the community level, partially conditioned by the distances between and cost in reaching the diverse territories. Key informants reported ongoing initiatives of training on gender, disability and SOGIESC, issues among national DRR focal points, police, media and first responders.[113] However, these trainings seem still generic, not focusing on a relationship with DRR/EWS. No performance review of EWS has been conducted by the NDMO in Fiji, and no accessibility assessment of the EWS system or evacuation centres has been conducted in the past to inform how to improve EWS design.

Most communities have focal points for women, older persons and persons with disabilities, but only two communities reported having received training on how to work with these groups in emergencies. The majority reported that they have regular coordination with organizations for women and persons with disabilities, and that older persons and persons with disabilities are represented in village meetings.

111 When women were interviewed separately from men, they were more vocal and open in sharing their views and experiences. In mixed groups with men present, women tended to follow traditional protocol and respond only when they were asked directly.
112 Fiji Department of Information, "Strengthening disaster preparedness coordination for Nadroga Navosa province", *The Fiji Times*, 16 July 2020.
113 In Fiji, over 300 people were trained annually on a five-day DRR training course, which included a simulation exercise.

Opportunities to build more connections come from the following:

- The Fiji National Cluster System, in which key agencies involved in DRR meet monthly, with three subcommittees on emergency, prevention and preparedness. An online dashboard was set up to enhance coordination for responses.

- In most cases, the countries experience challenges in capturing and analysing quantitative data even when some qualitative data may exist. The lack of a national integrated database or data-sharing protocols across line ministries creates obstacles for NDMOs/NMHS to draw profiles of communities and to identify both individual and communal capacities and vulnerabilities, which compromises the timeliness of targeted EWS.[114]

- Several technical working groups set up under the Pacific Resilience Partnership at the regional level (risk governance, disaster risk financing, human mobility, information management and localization), which could address intersectionality in EWS.

Credit to UNWOMEN

114 Fiji can generate a list of pre-identified vulnerable groups at the community level, to be used as a baseline.

05

CONCLUSIONS

Pacific SIDS have well-established institutional and legislative frameworks for disaster risk management, including action on climate change. There are many initiatives and efforts to achieve a shared vision and commitment across SIDS to mainstream gender and disability inclusion into DRR and EWS. While gender and disability are integrated into and referenced in national policies and strategies, the implementation in practice remains challenging. This is due to the limited financial, human and technical capacities to implement specific actions at the local level. There is a need to translate the commitments in policy frameworks into action and allocate dedicated and sustained budget for implementation and monitoring progress.

Despite significant progress and investments in disaster preparedness and response, especially at the community level, people continue to be left behind. The study found that women, youth, persons with disabilities, older persons and people with diverse SOGIESC are still excluded from discussions, planning and decision-making on climate and disaster resilience. Inclusive DRR requires a sound understanding of how gender, disability and other socioeconomic characteristics intersect with other social, physical, cultural and environmental vulnerabilities. There are opportunities to build on existing policies and practices to ensure inclusive DRR.

There has been significant investment in EWS capacity and infrastructure in the Pacific region, which has resulted in improvement of the capacity of NMHS. However, EWS should not only have a sound infrastructure and technical basis, but should also be people-centred, end-to-end, trusted and accessible to all. To achieve the "first mile", EWS must recognize and embrace diverse factors including the socioeconomic situation, literacy levels, cultural values, power dynamics, freedom of movement and physical location. Risk communication and warning dissemination are fundamental components of EWS and DRR. Warning messages must reach everyone in the community through multiple and trusted communication channels, including traditional ways of communication. The warning messages should be clear and simple to understand, actionable, and accessible in multiple formats that will enable appropriate preparedness and response actions by all persons. The communication channels and warning messages should be designed jointly with members of the community and be tested regularly through disaster preparedness drills and exercises.

Understanding the links between human rights and early warnings will ensure that warnings reach the "first mile" by increasing the accountability of government agencies responsible for issuing warnings. Using HRBA will facilitate participation of vulnerable and marginalized groups in the design and implementation of people-centred and inclusive EWS. Pacific SIDS already have a number of national policies and frameworks that promote gender equality and disability inclusion in DRR; however, more explicit actions, targets and benchmarks on early warnings will enhance the ongoing work.

Traditional and local knowledge for detecting and monitoring hazards and preparing for and responding to disasters is an integral part of the Pacific communities, which play a key role in the EWS value chain. The incorporation of local and traditional knowledge into warning systems may increase perceptions of reliability and improve local communities' understanding of climate and disaster risks and address their vulnerabilities.

Credit to UNWOMEN

06

RECOMMENDATIONS


Credit to UNDRR

The four elements of EWS must be systematically linked, tested, reviewed and improved with wider participation of its users. Critically, it must be individuals and communities who sit at the centre of EWS and connect all four elements.

Support for national and local authorities

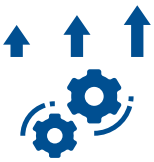
- Support strengthening governance and institutional arrangements to enhance people-centred and inclusive MHEWS.
- Support the capacities of national and local authorities to collect and analyse a wide range of disaggregated quantitative and qualitative risk and vulnerability data in collaboration with both traditional and non-traditional DRR actors (line ministries, departments and sectors, CSOs, business associations and schools), particularly with the direct involvement of marginalized groups in designing EWS.
- Build wider partnership on regional emergency communication plans and capacity-building for warning broadcasting.
- Support national authorities to engage CSOs strategically, supporting their capacity-building in a structured manner to ensure sustainability, or partner with agencies that are specialized in civil sector development.
- Systematically link funding for climate adaptation and DRR with EWS plans and strategies.

Resource/tool/knowledge developments

- Invest in developing hands-on tools for integrating gender, disability and other intersectional vulnerabilities in EWS, and provide this training and information online.
- Consolidate global and regional efforts and experiences in drafting accessible and easy-to-understand CAPs (images/pictogram/audio) for each hazard, for global distribution and country contextualization.
- Collect in-depth analysis of COVID-19 experiences, especially focusing on dissemination of accessible warning information and experiences of building community prevention/response capacities.
- Further research should be encouraged to explore how EWS interact with gender, disability and other socioeconomic vulnerabilities to better understand the specific needs of diverse groups and develop tailored warning messages.
- Co-develop easy-to-understand warning messages and communications channels in partnership with people at risk that will enable them to make decisions and take actions.
- Involve national and local media in co-designing warning messages (easy to understand, multiple formats) and their dissemination.
- Modify existing tools and guidelines into easy-to-understand and easy-to-act formats for wider usage at the local level.
- Regularly evaluate and verify the accuracy, timeliness and effectiveness of warning messages with the support of people and media, to ensure the effectiveness of warnings.
- Incorporate traditional and indigenous knowledge on early warning into the existing EWS.

Laws, policies and strategies

- Strengthen EWS elements in legal, policy and institutional frameworks on disaster risk management including climate change. Specifically, identifying roles and responsibilities, actions and standard operating procedures that would enable usage and operationalization of EWS.
- Establish data-sharing arrangements among different government agencies involved in early warnings to provide timely and accurate information that allow people at risk to take action.
- Ensure well-established coordination and procedures are in place among broadcasters, local media, NDMO and NMHS and other stakeholders to enable timely, accurate and tailored broadcast of warnings to the public during emergencies.



System enhancements

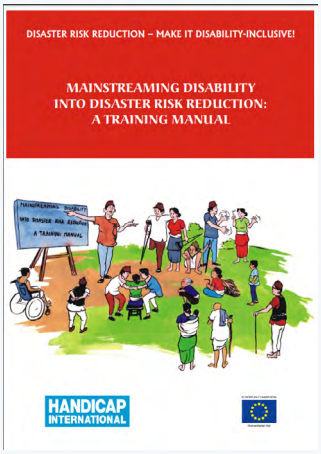
- Strengthen existing community-based, -owned and -managed MHEWS, including locally secured dissemination channels such as radio and phone/ SMS networks.
- Strengthen capacities to conduct simulation exercises to test EWS and provide support to develop detailed response plans accommodating different needs for evacuation and communication.
- Engage local communities, schools, CSOs, OPDs, faith-based organizations and media to periodically conduct performance reviews of the existing EWS, potentially through online tools to collect their feedback.
- Develop an approach for seamless information-sharing concerning persons and groups at heightened risk across different line ministries.
- Develop community feedback mechanisms through engaging community members, as well as the mass media.

Engagements with CSOs, OPDs and communities

- Work closely with the existing village committees, women's groups, churches and youth groups to integrate women, children, older persons and persons with disabilities in their disaster management activities, including EWS, and ensure their feedback is reflected and considered within the community plans.
- Engage community-based organizations strategically, and aim at building their technical and management skills, which they can contribute to sustainability of EWS.
- Encourage people at risk to develop preparedness and response plans and required arrangements to plan anticipatory actions better individually and collectively.

ANNEXES

ANNEX I: GOOD PRACTICES AND GUIDELINES

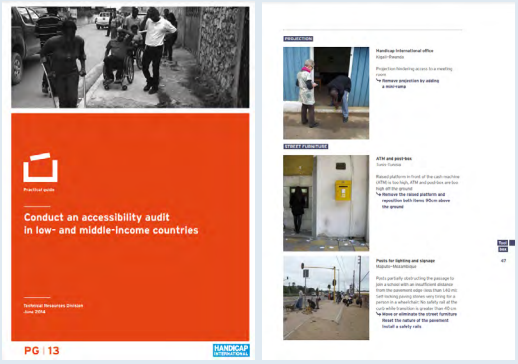


Mainstreaming Disability Inclusion into Disaster Risk Reduction

(Handicap International)

Handicap International in Nepal developed a comprehensive training manual for mainstreaming disability into DRR management. This manual contains a series of hands-on tools to understand in-depth interaction between disability and DRR:

- Disability and disaster situation analysis
- Vulnerability and capacity assessment
- Screening form for persons with disabilities

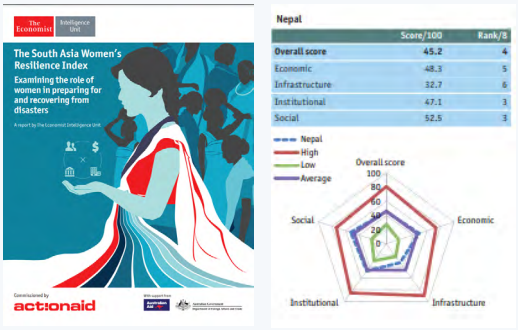


Conduct an Accessibility Audit in Low- and Middle-income Countries

(Handicap International)

Handicap International developed comprehensive guidelines and a toolbox for conducting a physical accessibility audit in low- and middle-income countries.

The toolbox contains a checklist, sample images and photos from low- and middle-income countries, and provides easily modified solutions.



Women's Resilience Index

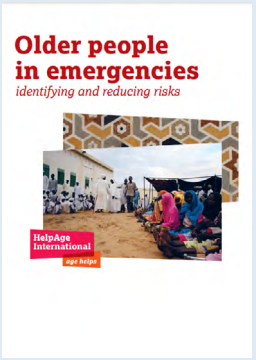
(The Economist Intelligence Unit)

The Women's Resilience Index contains a comprehensive set of questions, encompassing economic, infrastructure, social and institutional domains which are highly relevant for DRR gender analysis. This includes questions directly related to EWS. Its analytical tool can show strong or weak domains, which could apply to women, men and community elders (see page 34 above).

In addition, the tool also includes questionnaires which will assess education level, usage of communication technologies, social mobility, migration patterns, capacity, access, decision-making of women and perceived roles of the media, and its analysis could inform the EWS design.

Disability Inclusive Disaster Risk Management
(Disability-inclusive Disaster Risk Reduction Network and CBM)

Eleven good practices of disability- and vulnerability-inclusive DRR have been gathered that show concrete, practical examples of how persons with disabilities have been active participants in various DRR interventions.



Older People in Emergencies: Identifying and Reducing Risks
(HelpAge International)

Clearly presented collection of risks which older people may face in emergencies, in different sectors. It introduces key actions to reduce risks.

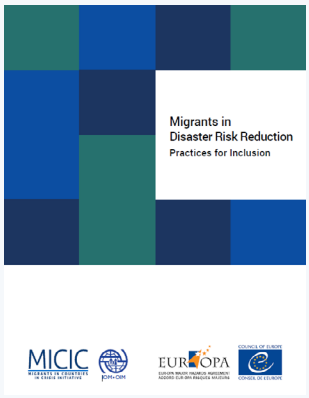
Card game to learn for DRR
(Save the Children Japan)

Based on hearings with children and their caretakers on their experiences during past disasters, Save the Children Japan developed a card game and cartoon book which people can use to better understand risk information and anticipatory action.

The National Secretariat of the Disaster Safe Education Unit of the Ministry of Education and Culture in Indonesia has also developed a board game to learn DRR.

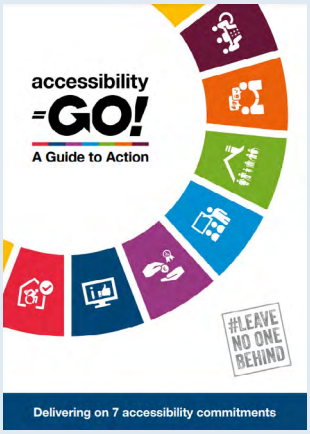
Mimamori receipts
(Save the Children Japan)

Based on hearings with children and their caretakers on their experiences during past disasters, Save the Children Japan developed a card game and cartoon book which people can use to better understand risk information and anticipatory action.



Migrants in Disaster Risk Reduction: Practices for Inclusion | IOM Publications Platform
(International Organization of Migration)

Introduce key risk factors in DRR for migrants, with some country examples.



Accessibility GO! A Guide to Action
(CBM and World Blind Union)

It provides practical supports on approach towards accessibility through seven commitments on the following themes:

1. Built environment
2. Information and communication
3. Procurements of goods and services
4. Training and capacity development
5. Programming
6. Meetings and events
7. Recruitment and HR management

E-accessibility Policy Tool Kit for Persons with Disabilities
(International Telecommunication Union and G3ict)

ANNEX II: CASE STUDY: PROACTIVE ENGAGEMENTS OF MEDIA IN EWS

Driven by annual fatal disasters including floods, tsunamis and cyclones, a public broadcasting agency took a drastic review of its disaster broadcasting. Japan's public broadcasting agency (Nippon Hoso Kyokai) is an example of a good practice for the media's role in EWS. In its approach to disasters, it now focuses on being understood by people instead of alerting people. The following are concrete examples of this good practice.

- There is a dedicated centre for 24/7 response to potential disasters, with two sub-hubs for disaster broadcasting (for radio and television), in case the main centre in Tokyo is down. The coverage of these centres is multilingual.
- Daily simulation exercises are conducted in the television sub-hub. Announcers are trained on different types of hazards.
- There is a focus on triggering anticipatory actions, using the language of "do", "don't" and "avoid" when hazards are approaching, not just providing the information of hazard details.
- A 100-page handbook has been developed on anticipatory actions, corresponding to different types of hazards (floods, storms, volcanic eruptions, earthquakes, nuclear disasters, etc.).
- The announcers have weather forecaster qualifications, and can translate technical data into impact information and convey real-time information.
- The broadcasting impact of each disaster is reviewed, comparing causality data, gathering data from people who received the warning information, and revising the warning information or the format of how information was displayed/broadcast.
- As detailed data/forecast become increasingly accurate, localized alerts become possible, identifying the exact locations at risk in order to warn local residents and prompt anticipatory actions.

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