General Assembly

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**Groups of countries in special situations: follow-up
to the Fifth United Nations Conference on the Least
Developed Countries**

Multi-hazard early warning systems in the least developed countries

Report of the Secretary-General**

Summary

　　The present report is submitted pursuant to General Assembly resolution 78/233, in which the Assembly welcomed the call by the Secretary-General to ensure that every person on Earth is protected by early warning systems within five years, and requested the Secretary-General to undertake, with the least developed countries, a comprehensive study involving all relevant United Nations development system entities and other relevant stakeholders on the existing arrangements, lessons learned and gaps identified and to submit it to the General Assembly at its seventy-ninth session for further consideration. The study was conducted drawing on available data and on consultations with the least developed countries, development partners, the United Nations development system and institutions supporting the Secretary-General's Early Warnings for All initiative.

　　The present report presents the key findings and recommendations stemming from the study.

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　　* A/79/150.

　　** The present report was submitted to the conference services for processing after the deadline for technical reasons beyond the control of the submitting office.

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I. Introduction

1.   In the Doha Programme of Action for the Least Developed Countries for the decade 2022–2031,[1] adopted in March 2022, the international community placed high priority on addressing climate change and building resilience by including them among its six priority areas. The Programme of Action contains a call for the reinforcement of comprehensive multi-hazard early warning systems and resilience-building measures for the least developed countries. In it, the international community invited the Secretary-General to undertake a comprehensive study on multi-hazard early warning systems in those countries, including on the existing arrangements, lessons learned and identified gaps. In response to that request, the Office of the High Representative for the Least Developed Countries, Landlocked Developing Countries and Small Island Developing States, in cooperation with the United Nations Office for Disaster Risk Reduction and the World Meteorological Organization (WMO), prepared a study in August 2024 entitled "Status of Multi-Hazard Early Warning Systems in the Least Developed Countries" which will be made available on the website of the Office of the High Representative, at www.un.org/ohrlls/.

2.   The study builds on the work and analysis carried out for the report entitled *Global Status of Multi-Hazard Early Warning Systems 2023*, launched at the twenty-eighth session of the Conference of the Parties to the United Nations Framework Convention on Climate Change, and follows the same broad methodology. To determine the status of those systems in the least developed countries, data was sourced from each of the four pillar leads of the Early Warnings for All initiative, as follows:

(a)   The Sendai Framework monitor of the United Nations Office for Disaster Risk Reduction, which provides data relating to target (g) of the Sendai Framework for Disaster Risk Reduction 2015–2030, namely, to "substantially increase the availability of and access to multi-hazard early warning systems and disaster risk information and assessments to people by 2030", in relation to each pillar of the Early Warnings for All initiative, as well as a compound score for such systems overall and information relating to pillar 1, on disaster risk knowledge and management;

(b)   The Country Hydromet Diagnostics monitoring system developed by WMO (in collaboration with the Alliance for Hydromet Development) and the data and reports stemming from the rapid assessment under pillar 2 of the Early Warnings for All initiative, which provide information on the status of detection, monitoring, analysis, forecasting and warning of the hazards and possible consequences;

(c)   The International Telecommunication Union DataHub and the associated *Facts and Figures* reports on the least developed countries, which were used to ascertain the status of pillar 3, on warning dissemination and communication;

(d)   The Anticipation Hub of the International Federation of Red Cross and Red Crescent Societies, in particular the data presented in the report entitled *Anticipatory Action in 2023: A Global Overview*, which provided insights into the status of pillar 4, on preparedness and response capabilities.

3.   A series of case studies was included in the study to provide real-world examples of how countries, institutions, organizations and communities are designing, implementing and operating early warning systems and multi-hazard early warning systems. The case studies were prepared by members of the Risk-informed Early Action Partnership and implementing partners of the Early Warnings for All initiative and highlight successes and best practices that can inform the global scaling

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[1] General Assembly resolution 76/258, annex.

up of multi-hazard early warning systems to meet the goals of the Early Warnings for All initiative.

4.   To gain insights into and further details about the facts and figures, consultations were undertaken with representatives of the least developed countries[2] and, subsequently, with development partners.[3] Initial findings were presented at the consultations, and participants were invited to comment on the trends observed and offer insights for incorporation into the present report.

5.   Another consultation was undertaken with more than 50 representatives of the wider United Nations development system,[4] at which participants had the opportunity to provide feedback on the first draft of the study and discuss related issues. The insights gained from that consultation were used to further refine the content, findings and recommendations of the present report.

6.   In the section below, an outline is presented of the key findings and recommendations contained in the study entitled "Status of multi-hazard early warning systems in the least developed countries". Readers are invited to consult the study for a more detailed discussion, including in-depth data analysis, graphs and case studies on individual countries and initiatives, as well as information from the various consultations that were undertaken as part of the preparations.

II.   Key findings and recommendations

A.   Low number of least developed countries reporting on multi-hazard early warning systems
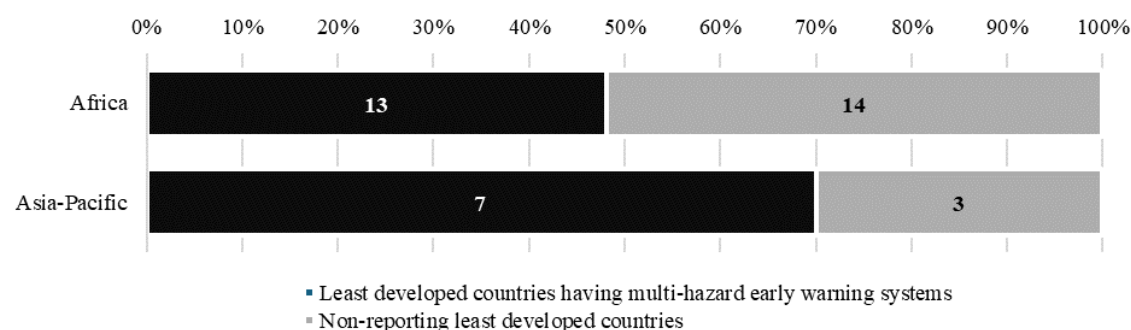
7.   Fewer than half of the least developed countries (20 out of a total of 45, or 44 per cent) have reported the existence of multi-hazard early warning systems, with the lowest proportion reported among the African least developed countries (13 out of 34, or 38 per cent). However, the African continent has shown the greatest improvement over the last decade, despite having started from a low base. Although few of the least developed countries have multi-hazard early warning systems, many of them acknowledge having single-hazard or sector-based early warning systems, often for hydrometeorological hazards. Nonetheless, these systems are not always viewed as a step towards or a precursor to multi-hazard early warning systems. It is recommended that the existence of a single-hazard early warning system should be reported under the Sendai Framework monitor as some form of multi-hazard early warning system, although it may result in a relatively low score in terms of comprehensiveness. Furthermore, the lack of disaggregated data (for example, in relation to sex, age and disability) makes it difficult to identify the actions required to address the existing gaps.

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[2] The majority of representatives of the least developed countries were from national meteorological and hydrological services and national disaster management authorities, with more than 30 participants from 17 such countries joining the virtual consultations, including representatives from Bangladesh, Burkina Faso, Burundi, Cambodia, the Comoros, Ethiopia, the Gambia, Guinea, Liberia, Madagascar, Malawi, Myanmar, Nepal, Senegal, the Sudan, Uganda and the United Republic of Tanzania.

[3] Representatives of the Permanent Missions of Belgium, China, Denmark, Germany, India, Italy, Portugal and Türkiye to the United Nations and of the Delegation of the European Union to the United Nations joined the consultation.

[4] The United Nations development system is defined as the principal organs of the United Nations (the General Assembly, the Security Council, the Economic and Social Council, the Trusteeship Council, the International Court of Justice and the Secretariat) and its specialized agencies, funds and programmes and related organizations.

Figure I
Proportion and number of least developed countries per region reporting the existence of multi-hazard early warning systems compared with global figures

	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%

Africa: 13 | 14

Asia-Pacific: 7 | 3

▪ Least developed countries having multi-hazard early warning systems
▪ Non-reporting least developed countries

Source: Sendai Framework monitor, 1 October 2023.

Recommendations

8.   The least developed countries are encouraged to report the existence of any early warning systems under target (g) of the Sendai Framework monitor and should receive the necessary technical support to do so. Wherever possible, the data collected should be disaggregated (by sex, age and disability, as well as other criteria, such as income and literacy), in order to enable informed decision-making regarding priority needs, especially among the most vulnerable communities. Data collection approaches should also take into consideration residents of informal settlements, as well as mobile and displaced populations.

9.   In particular, the least developed countries need support and capacity-building to:

(a)   Integrate pre-existing early warning systems into comprehensive multi-hazard early warning systems covering multiple hazards (including hydrometeorological hazards);

(b)   Design new early warning systems (including pilot systems) – possibly starting with a focus on a single, priority hazard – with the potential to scale up to multi-hazard early warning systems, considering the information, systems and structures (including governance) that are employed.

10.   Development partners are encouraged to take into account the need for integrated multi-hazard early warning systems at the national level and ensure that the design of any early warning system, however small, is country-led, so as to ensure compatibility.

Figure II
Number of least developed countries reporting the existence of multi-hazard early warning systems compared with global figures
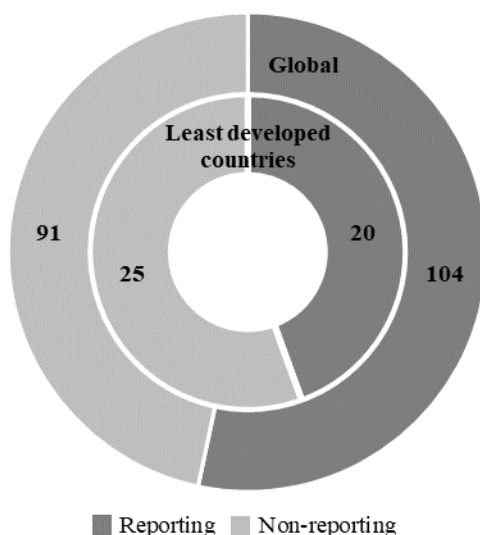
Source: Sendai Framework monitor, 1 October 2023.

B. Strong risk governance across all sectors as a precursor to successful multi-hazard early warning systems

11. Efficient and effective multi-hazard early warning systems depend on clearly defined roles and responsibilities for all stakeholders, including representatives of Governments, the private sector, civil society, academia and climate-sensitive economic sectors. Typically, national disaster management agencies or authorities (or the equivalent) will take the lead on multi-hazard early warning systems, especially in issuing evacuation orders when necessary. Technical support is provided by sector specialists, such as national meteorological and hydrological services for hydrometeorological hazards, and by other experts in fields such as food security, health, water and sanitation and humanitarian assistance. In many of the least developed countries, pre-existing thematic working groups provide a natural entry point for different economic sector experts to contribute to multi-hazard early warning systems. The designation of a single authoritative voice as the source of warnings is especially important and should be supported by all other actors in the system. To enhance the effectiveness of multi-hazard early warning systems, it is essential that all stakeholders understand, acknowledge and support each other in their designated roles. In addition, national policies, strategies and interventions should be risk-informed.

Recommendations

12. The least developed countries are encouraged to:

(a) Establish a national governance framework for multi-hazard early warning systems that clearly defines the roles and responsibilities of all stakeholders, designates a single authoritative voice as the source of warnings and ensures a mechanism for data-sharing. Representation should encompass all economic sectors and societal groups, such as women, young people, religious and traditional groups, including Indigenous Peoples, and humanitarian actors advocating for mobile and displaced populations;

(b) Involve non-public sector actors in the design, development and delivery of multi-hazard early warning systems. Such collaboration should include private, civil society, academic, media and grass-roots organizations, including representatives of Indigenous Peoples, to ensure that warnings are understandable and actionable and that the systems build on existing community resilience and use trusted communication channels.

13. Development partners are encouraged to:

(a) Support and encourage the least developed countries in the development and implementation of an effective governance framework for multi-hazard early warning systems;

(b) Support the least developed countries in building strong and equitable partnerships with non-public sector actors for the delivery of multi-hazard early warning systems.

C. Weak disaster risk knowledge across the least developed countries

14. Although, globally, pillar 1, on disaster risk knowledge, is lagging behind the other pillars, proportionally fewer least developed countries report having the necessary risk information. The situation is most acute in Africa. Disaster risk knowledge forms the foundation of multi-hazard early warning systems; the other pillars are dependent upon it. Without comprehensive disaster risk knowledge, the implementation of best practice approaches, such as impact-based forecasting, becomes very challenging.

Recommendations

15. The least developed countries are encouraged to assess hazards (including non-hydrometeorological hazards), vulnerability and exposure, in order to identify priority risks at the national level, the most at-risk communities and potential hotspots. Wherever possible, the data collected should be disaggregated by sex, age and disability, as well as other criteria, such as income and literacy.

16. The least developed countries are encouraged to use existing platforms and portals that host risk-related data and tools, such as the Economic and Social Commission for Asia and the Pacific Risk and Resilience Portal.

17. Development partners are encouraged to support the least developed countries in the collection, management and analysis of detailed, disaggregated disaster risk knowledge through a combination of technical and financial support, so as to provide the systems and skills required to undertake and maintain disaster risk knowledge, including data on loss and damage. Investments should be focused on making data available, accessible and interoperable, and on strengthening or adapting existing systems, as opposed to on the creation of new systems, especially those that rely on sophisticated information and communications technology infrastructure, which many of the least developed countries do not have.

D. Limited use of impact-based forecasting approaches in the least developed countries

18. Although impact-based forecasting approaches represent a powerful tool for multi-hazard early warning systems, very few of the least developed countries are using them. Typically applied to the prediction of hydrometeorological hazards, impact-based forecasting combines an assessment of the likelihood or probability of a hazard occurring with the impact that it could have, in order to provide an overall assessment

of risk for an area or location and a specified time. The benefit of the impact-based forecasting approach is that the focus is shifted from what the weather will be like to what the weather will cause to happen, thereby guiding the actions that should be taken, while recognizing that both the impact and the actions required may differ significantly across economic sectors. The use of probability means that there is the potential to give lower-level risk warnings several days in advance, with the level of certainty about the extent, potential impact, likely location and timing of the hazard improving over time, allowing the overall level of risk to lives, assets and livelihoods to be increased or decreased accordingly. Despite the potential of impact-based forecasting, few of the least developed countries are issuing forecasts or warnings produced using such approaches, in part because of a lack of hazard information and training. Because a multi-sectoral approach is implicit in impact-based forecasting, a lack of collaboration between national meteorological and hydrological services and representatives of the different economic sectors may be another limiting factor. The situation in the least developed countries is further compounded by the frequent lack of technologies and the weak state of observation networks (required for monitoring hazards) and forecasting systems (to analyse data and generate warning products).

Recommendations

19.   The least developed countries are encouraged to take action to gain access to and implement impact-based forecasting approaches within their institutions, especially national meteorological and hydrological services, and collaborate with representatives of climate-sensitive economic sectors, such as agriculture, energy, health, water, infrastructure and transport, to define impact thresholds, exposure and vulnerabilities. Intersectoral data collection and sharing should be promoted as a foundational activity for impact-based forecasting.

20.   Development partners are encouraged to support the least developed countries in their implementation of impact-based forecasting by leveraging opportunities to collect disaster risk information, develop and install systems that support impact-based forecasting and provide both training and skills opportunities and technical support for staff.

E.   Dissemination of warnings to the first or final mile remains a challenge

21.   Despite recent advances in the coverage and uptake of mobile and Internet technology worldwide and in the least developed countries, it remains challenging to reach some of the most vulnerable communities, especially those in rural areas where gaps in access and usage persist. Although there is a promising trend in the uptake of mobile technology among younger generations, there is a persistent gap between genders. Even in countries with good network coverage, the cost of mobile Internet, in terms of both devices and data, renders this technology out of the reach of the poor. This means that multi-hazard early warning systems cannot rely solely on digital technology, including mobile applications and social media channels, to disseminate actionable warning messages, and that text messages and voice calls are still essential channels, especially in rural areas. Non-digital channels, such as television and radio, are also important, although they may still fail to reach rural communities, meaning that more traditional communication networks, such as community groups, and no-tech solutions, such as loudspeakers and flags, should be part of multichannel multi-hazard early warning systems. To ensure that all the intended populations, including the most marginalized groups residing in rural areas and persons with disabilities, receive actionable early warning and advisory messages, these warnings

can be disseminated through outreach and communication channels established under national social protection systems.

Recommendations

22.   The least developed countries are encouraged to ensure a multichannel approach in disseminating actionable warnings that take language and accessibility needs into account, especially in areas with high displacement levels or multilingual populations. Channels should include no-tech solutions (billboards, noticeboards, flags, loudspeakers or sirens), traditional media (radio and television) and mobile-based solutions (such as voice calls, text messages and early warning system messaging through cell broadcasts and location-based text messages, as well as solutions for persons with disabilities), in addition to more advanced digital solutions, such as mobile applications, social media and the wider Internet (email and websites).

23.   The least developed countries are encouraged to develop national legislation guaranteeing the free and prioritized broadcasting of early warnings across all media outlets, both public and private, including local radio stations and community-based communication networks that are vital for reaching all citizens, such as residents of informal settlements and displaced or marginalized groups.

24.   The least developed countries are encouraged to work with mobile network operators to:

        (a)   Continue investing in mobile infrastructure and in the expansion or improvement of networks;

        (b)   Support the dissemination of actionable warnings through cell broadcasts or location-based text messages and the use of the Common Alerting Protocol, as well as through the use of voice calls and generic text messages within communities and Internet-based dissemination (including through email and official websites);

        (c)   Reduce the costs of mobile Internet in order to, at a minimum, meet the affordability target set by the Broadband Commission for Sustainable Development;

        (d)   Negotiate affordable rates[5] for the provision of text messages related to public warnings, for as long as the demand for text messages exists.

25.   The least developed countries are encouraged to leverage available information management systems and databases, as well as outreach and communication systems established under social protection mechanisms, so as to disseminate actionable early warning and advisory messages to the intended populations, including the most marginalized persons living in rural areas.

26.   Development partners are encouraged to:

        (a)   Support the least developed countries in their discussions with mobile network operators and in the development of appropriate legislation and technical infrastructure, in order to enable cell broadcasts or location-based text messages to support public service messaging for early warnings;

        (b)   Ensure that warnings are not disseminated solely through digital channels, but that they are disseminated consistently across multiple channels that are selected on the basis of local needs.

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        [5] Ideally, there would be no charge for the dissemination of public service messages such as warnings of an impending hazard, whether by text message, television or radio.

F. Lack of operational systems and infrastructure to support multi-hazard early warning systems in many of the least developed countries

27. The status of equipment and infrastructure varies widely among the least developed countries – some have almost no equipment, while others have relatively advanced networks and systems. Many of these countries are attempting to establish early warning systems or multi-hazard early warning systems despite having insufficient or inoperable monitoring and forecasting systems and infrastructure. Often, they are unable to operate or maintain equipment due to a combination of factors, such as a lack of spare parts; insufficient operational budgets (for running costs, such as electricity and communications); insufficient access to energy; preventative maintenance and calibration costs; a proliferation of obsolete or obsolescent systems (hardware and software); and a lack of skilled technicians and engineers. It is worth noting that none of the least developed countries is compliant with the guidelines of the Global Basic Observing Network,[6] although it is encouraging to see the significant progress made as a result of the Systematic Observations Financing Facility and other projects and investments, such as the Climate Risk and Early Warning Systems initiative. Under the Facility, the traditional focus on capital expenditure is shifted towards a mechanism through which a contribution will be made to ongoing operational costs,[7] in exchange for data. The hope is that the effect of these investments will be seen in Global Basic Observing Network statistics in the future. However, the approach taken by the Facility is unusual and, although some funds are provided for operations and maintenance, countries still need to contribute.

Recommendations

28. The least developed countries and, more specifically, their national meteorological and hydrological services and the ministries that oversee them, are encouraged to work with development partners to establish sustainable funding models for multi-hazard early warning system infrastructure, moving beyond capital investments to include recurring operational costs, maintenance and staff training, so as to ensure long-term functionality.

29. The least developed countries are encouraged to collaborate with humanitarian agencies and development partners to map the locations of vulnerable groups, including informal settlements, camps for internally displaced persons and high-risk displacement zones. They should also ensure that infrastructure, such as monitoring stations and communication towers, is placed strategically or designed for rapid deployment to serve these dynamic populations.

30. Development partners are encouraged to consider adjusting their funding models or to identify other mechanisms, including collaboration with the private sector, to ensure that investments are not focused solely on capital expenditure. Best practice also requires, at a minimum, that investments in equipment include training for both operators and maintainers of the equipment and that provisions be made for the equipment needed to maintain and calibrate systems and sensors. There may also

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[6] The Global Basic Observing Network, established by the World Meteorological Congress, aims to provide a global basic set of observations in support of improved global numerical weather prediction. The Network provides a minimum level of standard practices and requirements. It standardizes the requirements for observed sets of variables that are to be shared internationally, for four different types of observing stations. Members commit to assigning surface land stations, upper-air stations operated from land, surface marine stations in exclusive economic zones and upper-air stations in exclusive economic zones to the Network.

[7] Operational costs typically include expenses relating to power, communication and consumables (especially for meteorological observations of the upper air).

be a need for technical support to develop short-, medium- and long-term operation and maintenance plans, including system monitoring and routine planned preventative maintenance. Investments should also be appropriate to the local context – this does not necessarily mean investing in the most recent technology, but rather in equipment that can be operated and maintained with limited or intermittent electricity, Internet or processing capabilities.

G. Growing momentum for anticipatory action

31. The shift from purely reactive responses towards anticipatory or early action is gathering momentum. More of the least developed countries are developing and implementing anticipatory action frameworks, together with less formal interventions. More recently, many of the least developed countries have benefited from the existence of such plans, which have been activated in response to thresholds being met for floods, drought and tropical cyclones, among others other hazards. While many least developed countries have one or more plans in place, some only have hyper-local plans for specific hazards affecting small communities, and some have no plans at all. This means that the number of anticipatory action frameworks and equivalent arrangements needs to be increased, so that every one of those countries has similar frameworks for all identified hotspots and, ideally, for all priority hazards.

Recommendations

32. The least developed countries are encouraged to develop anticipatory action frameworks for hotspots and priority hazards.[8] As far as possible, these plans should anticipate potential displacement scenarios, including those resulting from pre-emptive evacuations. Plans should include resource pre-positioning, safe evacuation routes and consideration for tailored warning dissemination for internally displaced persons and highly mobile populations.

33. The least developed countries are encouraged to explore ways to integrate anticipatory action frameworks into broader national disaster risk management action plans and strategies.

34. Development partners are encouraged to support the development of anticipatory action frameworks, including by providing technical support at the design stage and financial support for the provision of flexible and pre-arranged funding for such action, when triggered, and in the immediate lead-up to that point, as well as for support on the ground to heighten preparedness.

35. Development partners are encouraged to improve cross-sectoral cooperation, include more diverse funding sources and look for opportunities to expand financial mechanisms and instruments to mainstream anticipatory action frameworks.

H. Harnessing the power of young people

36. As highlighted above, young people have the potential to support the implementation of effective multi-hazard early warning systems. They are embracing digital technology and are active receivers and disseminators of information. When empowered with education about the hazards, exposure and vulnerabilities affecting

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[8] Anticipatory action frameworks would also contribute to achieving target (c) of the Sendai Framework for Disaster Risk Reduction 2015–2030, on reducing direct disaster economic loss, and target (d), on reducing damage to critical infrastructure and disruption of basic services.

their areas, young people can help to promote awareness and action within their communities.

Recommendations

37.   To maximize the opportunities afforded by youth:

(a)   The least developed countries should encourage young people to take an active role in the entire process – from the planning of multi-hazard early warning systems to their design, implementation, monitoring and evaluation;

(b)   Development partners are encouraged to consider the possibility of involving young people and associated groups, such as schools and youth groups, in multi-hazard early warning system initiatives.

I.   Early Warnings for All initiative catalysing multi-hazard early warning systems

38.   Many of the least developed countries reported that the Early Warnings for All initiative is bringing together the various agencies and institutions involved in multi-hazard early warning systems at the national and regional levels. In several of these countries, the groundwork is now complete and the focus has now been placed on implementation. While progress has been good among the least developed countries identified for accelerated support under the initiative, for the Secretary-General's goal to be met, support needs to be scaled up across all the least developed countries, and all countries globally. However, implementing the initiative is especially challenging in the least developed countries – even more so in those that are fragile or affected by conflict, violence and/or natural hazard-induced disasters. The latter often have additional challenges to contend with, such as weak governance, poor or non-existent infrastructure and highly vulnerable populations, including internally displaced persons and others living in temporary camps, which increases their risk. In such contexts, a flexible and conflict-sensitive approach to the planning and programming of multi-hazard early warning systems is advised.

Recommendations

39.   The least developed countries are encouraged to continue moving forward with the actions required to implement the Early Warnings for All initiative.

40.   Development partners are encouraged to:

(a)   Support all the least developed countries in implementing the Early Warnings for All initiative by providing technical and financial support and ensuring that activities, projects and programmes are aligned;

(b)   As far as possible, adopt a flexible and conflict-sensitive approach to the implementation of multi-hazard early warning systems in the least developed countries.

41.   Regional institutions support national action. Many of the least developed countries lack the national infrastructure, systems and specialist staff required to monitor and predict the occurrence of hazards, including hydrometeorological hazards. Accordingly, regional institutions have an important role to play, whether they are intergovernmental institutions, such as the Regional Integrated Multi-hazard Early Warning System for Africa and Asia, or extensions of United Nations agencies, such as the WMO regional specialized meteorological centres. These institutions and centres provide essential technical guidance and training to national meteorological and hydrological services and other institutions and agencies in their regions and take a leading role in transboundary initiatives, such as the WMO-led Severe Weather

Forecasting Programme, Tropical Cyclone Programme and Flash Flood Guidance System.

42.	The least developed countries are encouraged to take every opportunity to use regional products and participate in regional initiatives that relate to hazard monitoring, prediction and warnings.

43.	Development partners should encourage and facilitate the use of regional products by the least developed countries and their participation in regional initiatives, including by:

	(a)	Providing funds for technical staff to participate in regional training sessions and meetings;

	(b)	Ensuring that the products of regional centres are included as data inputs for multi-hazard early warning system projects;

	(c)	Advocating for sufficient and robust infrastructure, especially Internet bandwidth, to enable participation in online events;

	(d)	Encouraging regional centres to be inclusive of all countries in the region, for example by considering the need for products and training to be provided in different languages.

## J.	Multi-hazard early warning systems must be country-led

44.	The number of projects and initiatives that are focused on or related to multi-hazard early warning systems is increasing. While this is a positive development, it introduces the risk of having an activity that has worked in one location transported to another, without sufficient adjustments to the local context. Effective multi-hazard early warning systems must be people-centred and locally led. This includes the need to adopt gender-responsive, conflict-sensitive and socially inclusive approaches when establishing such systems, so as to maximize the benefits for all population groups and ensure that no one is left behind. Interventions relating to multi-hazard early warning systems must also be aligned with national plans, including national disaster risk reduction and climate change sectoral policies, strategies and plans. Due consideration should also be given to the need for alignment with regional plans in relation to transboundary systems, such as river basins, and hazards, such as pests and diseases, and with international agreements.

45.	As many of the least developed countries lack the financial and technical resources required to design, implement, monitor and evaluate multi-hazard early warning systems on their own, there is an inevitable reliance on external resources, projects and technologies, including equipment and systems. For such initiatives to be successful, the national context must be taken fully into account, the gaps and needs identified in the multi-hazard early warning system value chain must be addressed and the focus must be on more than a purely technological or methodological solution. By targeting national priorities, it is possible to avoid mistakes made in the past, such as the proliferation of incompatible equipment or duplication of project outcomes. To ensure that investments and interventions relating to multi-hazard early warning systems meet country needs, there should be a national road map[9] for their implementation that clearly identifies what is needed, where it is

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[9] The term road map is used here to cover a range of equivalent terms, including plans, strategies, frameworks and concepts of operations, that are aimed at achieving a particular goal, such as the implementation of the Early Warnings for All initiative.

needed and when it is needed. Any such road map should be aligned with existing development and investment plans at the national, sectoral and local levels.

Recommendations

46.   The least developed countries are encouraged to develop national road maps for the implementation of multi-hazard early warning systems.

47.   Development partners are encouraged to:

        (a)   Support the least developed countries in developing national road maps for the implementation of multi-hazard early warning systems;

        (b)   Ensure that their investments and interventions are aligned with countries' national plans.

III.   Conclusions

48.   **Making progress on target (g) of the Sendai Framework, on increasing the availability of and access to multi-hazard early warning systems and disaster risk information and assessments, is critically important to achieving progress on target (a), on reducing global disaster mortality, target (b), on reducing the number of affected people globally, target (c), on reducing direct disaster economic loss, target (d), on reducing damage to critical infrastructure and disruption of basic services, and target (f), on enhancing international cooperation to developing countries.**

49.   **Member States, the broader United Nations system, civil society organizations and development partners across the public and private sectors are invited to consider the above-mentioned recommendations for accelerating action to address gaps and deliver people-centred, end-to-end multi-hazard early warning systems in the least developed countries.**

50.   **While important progress has been made in the least developed countries in recent years, through various initiatives implemented at the national, regional and international levels, these countries have the most acute needs and are the furthest behind. All stakeholders are invited to prioritize and accelerate their efforts in support of these countries.**

51.   **Given the urgency of action and the importance of achieving progress on multi-hazard early warning systems, regular monitoring of progress remains critical to assess the achievement of the Secretary-General's goal of ensuring that everyone on Earth is protected from hazardous weather, water or climate events by 2027, through effective multi-hazard early warning systems that save lives and livelihoods.**

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