

# Key Learning and Trends

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## State of Early Warning Systems

The state of early warning systems (EWS) across the Asia-Pacific region reveals significant progress, yet substantial challenges remain, particularly in rural and underserved areas. One of the primary issues is limited coverage and gaps in EWS, especially in geographically isolated regions.

- **Limited Coverage and Gaps in EWS:** Across the Asia-Pacific region, while early warning systems (EWS) have advanced significantly, substantial gaps persist, particularly in rural and underserved areas. For example, in the Philippines, despite having a comprehensive EWS for typhoons, challenges remain in reaching rural areas due to inadequate infrastructure and connectivity issues. Remote locations often lack the necessary technology and infrastructure to receive timely warnings, leading to delayed or missed notifications (Asian Disaster Preparedness Center, 2023). In Myanmar, the effectiveness of flood warnings is compromised by a lack of coordination and connectivity at the local level, which prevents timely dissemination of alerts to affected communities (ADPC, 2023). The Philippine government, in collaboration with international organizations, is working on improving the reach of early warning messages through mobile technologies and community-based systems. Similarly, Myanmar is investing in local-level coordination and communication networks to better disseminate flood warnings.
- **Community-Based EWS:** Community-based early warning systems have shown promising results in enhancing the effectiveness of EWS, especially in areas prone to natural disasters. In Vietnam, the Vietnam Red Cross has implemented community-based programs that train local populations to interpret and disseminate warnings effectively (IFRC, 2023). These programs empower communities to act on early warnings and take preemptive measures, thereby improving overall resilience. Ensuring that communities remain engaged and well-informed requires sustained support and resources. Initiatives are being developed to strengthen community training programs and establish more robust feedback mechanisms to continually improve the effectiveness of these systems.
- **Integration of Climate Data:** Integrating climate data into early warning systems has been a significant advancement in improving the accuracy and lead time of warnings. In Bangladesh, the Flood Forecasting and Warning Centre (FFWC) has incorporated climate projections to extend lead times for flood warnings, allowing for earlier

anticipatory actions (United Nations Development Programme, 2024). This integration has enabled more precise forecasting, leading to better preparation and response measures. The accuracy of climate projections and the ability to translate them into actionable early warnings are ongoing concerns. There are plans to enhance data collection and modeling capabilities. Efforts are underway to improve the integration of real-time climate data with EWS to provide more accurate and timely information.

## Anticipatory action

Anticipatory action has increasingly become a cornerstone of disaster management strategies within the humanitarian sector, particularly across the Asia-Pacific region. This proactive approach, driven by early warning systems and predictive analytics, enables humanitarian organizations to implement preemptive measures that mitigate the impact of disasters before they strike. Recent trends highlight the growing importance of integrating forecast-based financing, addressing climate-induced and slow-onset disasters, and engaging local communities in anticipatory planning.

- **Enhanced Integration of Forecast-Based Financing and Early Warning Systems:** Forecast-Based Financing (FbF) represents a significant advancement in anticipatory action, allowing for the timely allocation of resources based on predictive models. This integration helps implement preemptive measures before a disaster strikes, reducing overall impact. For instance, the International Federation of Red Cross and Red Crescent Societies (IFRC) has expanded its Disaster Relief Emergency Fund (DREF) to include anticipatory actions, providing early funding based on forecasts (IFRC, 2023). In Southeast Asia, countries such as Bangladesh and the Philippines have successfully employed FbF mechanisms. In Bangladesh, anticipatory cash transfers before Cyclone Amphan helped mitigate economic losses and support quicker recovery (World Bank, 2021). Similarly, in the Philippines, early funding facilitated evacuations and distribution of emergency supplies.
- **Focus on Climate-Induced Disasters and Slow-Onset Events:** Historically, anticipatory actions have focused on rapid-onset disasters such as floods and cyclones. However, there is a growing emphasis on addressing slow-onset events like droughts

and heatwaves. In the Asia-Pacific region, anticipatory actions have been tailored to cope with the prolonged effects of such crises. For example, in Mongolia, anticipatory measures have been implemented to address the impacts of dzud (harsh winters) by pre-positioning resources and supporting vulnerable communities before the onset of severe weather conditions (Oxfam, 2024). Similarly, in Pakistan, anticipatory actions for droughts have included early support for agricultural communities to mitigate the effects of prolonged dry periods. Solutions include enhancing early warning systems to better predict the onset of slow-onset disasters and integrating these predictions into long-term planning and resource allocation.

- **Importance of Localized Approaches and Community Engagement:** The effectiveness of anticipatory actions is significantly improved when localized approaches and community engagement are prioritized. Recent studies highlight the importance of incorporating local knowledge and involving communities in the design and implementation of anticipatory measures. For example, in the Philippines, local disaster management committees have played a crucial role in improving the effectiveness and acceptance of preemptive measures (Asian Development Bank, 2023). Community-led anticipatory actions have proven more effective in addressing specific vulnerabilities and ensuring timely responses. Ongoing efforts focus on strengthening community-based systems and providing continuous support and training to local organizations. Additionally, there is a need for better feedback mechanisms to ensure that community inputs are integrated into anticipatory planning.

## International vs. domestic funding

Funding plays a crucial role in shaping how effectively countries can manage and mitigate the impacts of natural hazards. In South Asia, domestic funding is increasingly focused on enhancing national disaster management capacities. Trends indicate a growing emphasis on integrating disaster preparedness with national development plans, as seen in ASEAN countries like Indonesia and the Philippines, which have established dedicated funds. International funding trends show an increase in international investments aimed at regional cooperation and long-term resilience projects, with programs like the ASEAN-PDC partnership and the Asian Development Bank's climate finance initiatives.

### Domestic Funding

- **National Capacity Building Initiatives:** Many rural and underserved areas still face gaps in disaster preparedness due to insufficient funding and infrastructure. To combat these issues, governments are investing in the development of local early warning systems and disaster preparedness infrastructure. India has significantly upgraded its state highways in Bihar to improve transportation and enhance disaster resilience. Countries like Indonesia and the Philippines have established national disaster risk reduction and management funds that are used to finance immediate disaster response efforts, as well as longer-term resilience projects. Moreover, Bangladesh's national budget has supported the rebuilding efforts after the 2022 floods, emphasizing the importance of sustained domestic investment in recovery and preparedness.
- **Localized Disaster Response Mechanisms:** Domestic funds are being directed towards creating and maintaining localized disaster response mechanisms, such as National Disaster Management Offices (NDMOs). These offices operate at various administrative levels to ensure timely and effective disaster response. For example, Bangladesh's approach to disaster management includes localized response systems that leverage domestic funding for immediate recovery efforts (UNDP, 2024).

- **Integration with National Development Plans:** Domestic funding in South Asia is increasingly integrated with national development plans, ensuring that disaster resilience is a key component of broader economic and infrastructural development. For instance, the Asian Development Bank's involvement in Sri Lanka and the Maldives shows how national investments align with sustainable development goals, reducing vulnerability to disasters as part of economic planning (ADB, 2023). Incorporating disaster resilience into national development strategies can ensure that funding is effectively allocated and utilized.

## International Funding

- **Anticipatory Action and Early Warning Systems:** The IFRC's Disaster Response Emergency Fund (DREF) has been expanded to include anticipatory actions, providing early funding based on forecasts (IFRC, 2023). This approach is vital for pre-positioning resources and activating early action protocols based on meteorological predictions. A key challenge is ensuring that international funds are used effectively and reach the communities most in need. Additionally, there can be delays in fund disbursement and issues with coordination among international donors and local partners. Improving transparency and accountability in fund management, along with strengthening coordination mechanisms, can enhance the effectiveness of international funding.
- **Cross-Border Collaboration and Technology Transfer:** Programs like the ASEAN-PDC collaboration, funded by USAID, enhance regional disaster resilience through advanced technological systems (USAID, 2024). These initiatives facilitate regional cooperation and the sharing of best practices and technologies. Challenges include ensuring equitable access to technology and fostering effective collaboration among diverse stakeholders. There can also be issues with the sustainability of technology and knowledge transfer initiatives. Building strong partnerships and fostering inclusive collaboration among regional and international stakeholders are crucial to overcome the barriers between cross border collaboration. Focusing on sustainability and capacity building can ensure that technology and knowledge transfer initiatives have long-term impacts.
- **Support for Long-Term Resilience Projects:** International donors are increasingly funding long-term resilience projects that align with global climate goals and sustainable

development. For example, the Asian Development Bank's climate finance initiatives in South Asia focus on renewable energy and sustainable tourism, addressing both immediate disaster risks and long-term resilience (ADB, 2023). Long-term projects face challenges such as ensuring continued funding and integrating resilience measures into broader development goals. There can also be difficulties in measuring the impact of long-term resilience investments. Developing robust monitoring and evaluation frameworks can help assess the effectiveness of long-term projects.

## Benefits of preparedness

By addressing potential impacts before they escalate, anticipatory actions often result in more efficient and cost-effective disaster responses. Preparedness initiatives that engage local communities in the planning and implementation of anticipatory actions enhance overall community resilience.

- **Mitigating losses and damage impact:** Preparedness through anticipatory action significantly reduces human suffering and economic losses by allowing preemptive measures to be implemented before a disaster fully unfolds. This proactive approach can prevent or mitigate the impact of hazards, such as floods and cyclones, and reduce the need for reactive emergency responses. For instance, anticipatory cash transfers in Bangladesh before Cyclone Amphan helped mitigate economic losses and facilitated quicker recovery for affected communities. Similarly, preemptive actions, like evacuations and health protection kits, have demonstrated their effectiveness in reducing the immediate impacts of disasters, thereby safeguarding lives and livelihoods.
- **Improved Efficiency and Cost-Effectiveness:** Forecast-Based Financing (FbF) and similar mechanisms allow for timely financial allocations based on predictive models, which enhances the speed and precision of response efforts. Studies indicate that integrating predictive analytics with funding mechanisms improves the timeliness and effectiveness of disaster responses, thereby potentially reducing overall response costs. The use of Forecast-Based Financing and predictive analytics has been increasingly adopted, leading to more cost-effective and timely disaster responses.

- **Enhanced Community Resilience and Local Ownership:** By incorporating local knowledge and involving communities in decision-making processes, anticipatory actions are tailored to specific vulnerabilities and needs. Evidence from the Philippines and other Southeast Asian countries highlights the positive impact of community-led anticipatory actions. Local disaster management committees have played a crucial role in improving the effectiveness and acceptance of preemptive measures, thus fostering stronger community ownership and resilience.

## Key contextual learnings e.g. on protracted crisis and climate/disasters

- **Protracted Crises and Long-Term Preparedness:** Addressing protracted crises and slow-onset disasters, such as prolonged droughts and recurring flooding, requires a shift towards long-term preparedness strategies. The increasing frequency and severity of climate-induced events necessitate sustained efforts beyond immediate response. For instance, the World Bank emphasizes the need for mechanisms that address gradual climatic changes and protracted crises. This approach involves integrating anticipatory actions into broader disaster risk management frameworks and focusing on building long-term resilience in affected communities.
- **Adaptation to Climate Change:** The urgency of climate change impacts underscores the importance of adapting anticipatory actions to address evolving risks. The Intergovernmental Panel on Climate Change (IPCC) highlights that areas vulnerable to climate change, such as coastal zones and floodplains, face increasing risks. Effective preparedness strategies must account for these changing conditions and incorporate measures to adapt to new climate realities. For example, the integration of climate risk assessments into anticipatory actions can help communities better prepare for and respond to emerging climate challenges.
- **Strengthening Local Capacities and Systems:** Building local capacities and strengthening community-based systems are essential for effective preparedness and



response. The Grand Bargain agreement from the World Humanitarian Summit emphasizes the need to empower local organizations and integrate their knowledge into disaster response efforts. Investing in local disaster management capabilities and ensuring that communities have the tools and resources needed to implement anticipatory actions are critical for enhancing overall resilience. Local NGOs and disaster management committees play a vital role in this process, contributing to more effective and contextually relevant responses.

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## Additional Studies

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2. [Asian Disaster Preparedness Center \(ADPC\)](#)
3. [Early Warning Systems: UN](#)
4. [Oxfam Reflections on Humanitarian Work in Asia](#)
5. [ADB South Asia Overview](#)
6. [ASEAN Committee on Disaster Management - Regional Early Warning](#)
7. [Asia Rising Economic Star or Poster Child of Disaster](#)