Briefing | Target 7

Early warning systems and disaster risk information

Elizabeth Carabine
Lindsey Jones

February 2015

This note provides information relevant to the agreement of target (vii) of the draft Post-2015 Framework for Disaster Risk Reduction (DRR), which reads: *Ensure access to impact-based early warning and disaster risk information [to 90% of the people] by 2030* and its five variations.

Context

Over the past decade, regions and countries have made significant progress in developing and implementing Early Warning Systems (EWS). Much of this advancement owes to enhanced observational and monitoring systems, improved information and communication technology (ICT) and increased public awareness of the importance of DRR.

Bangladesh offers an example of the power of extending the coverage of EWS. The country now has a 48-hour EWS in place that allows people to evacuate to safe shelters hours before cyclones make landfall, reducing the number of deaths. In 1970, 300,000 died as a result of Cyclone Bhola, compared with 3,000 in 2007 during Cyclone Sidr, an event of a similar magnitude that authorities were able to track as it grew in strength.[1] Even where risks are more complex and take longer to develop, such as with droughts, EWS have helped prevent large losses of life, across Sub-Saharan Africa and elsewhere.[2]

However, many developing countries have not seen the benefit of these advances, and there is still a significant challenge in reaching the most vulnerable and remote communities. Of 133 countries surveyed in 2011, just over a quarter self-reported as having EWS coverage.[3] At the same time, risks are rapidly shifting, with demographic, economic and political changes dramatically altering the risk landscape. Even in contexts where disaster risk information is readily available, political and institutional barriers can prevent the effectiveness of EWS.[4] Significant challenges therefore remain.

What are early warning systems for DRR?

Definition: EWS describes the set of capacities needed to generate and disseminate timely and meaningful warning information to enable individuals, communities and organisations threatened by a hazard to prepare and to act appropriately and in sufficient time to reduce the possibility of harm or loss.[5]

Examples of EWS technologies

Climate forecasting: Most countries now have EWS in place that make use of climate forecasts days, weeks and even months into the future and communicate warnings to relevant local stakeholders. These systems are based on state-of-the art climate models and are of particular use in preparing for climate extremes.

Mobile phone technology: With the spread of mobile phones and networks across the globe, this technology is now increasingly used to communicate warnings and coordinate preparation activities, particularly Short Message Service (SMS) alerts to disseminate mass messages. For example, on detection of the early signs of an earthquake development, Japanese agencies send out SMS alerts to all registered mobile phones in the country.

ICTs: The use of crowdsourced data is gaining traction as internet connectivity and the availability of ICTs such as mobile phones increase. Crowdsourcing was used extensively in the response to the 2010 Haiti earthquake, allowing local people, mapping experts and other stakeholders to communicate what they saw and heard on the ground and to produce information that humanitarian workers could use.[6]

EWS come in many different forms. Whether they focus on one particular hazard or many, they should be composed of four elements in order to span all steps, from detection of hazards through to responding to them at community level. These elements are:

- Knowledge of the risks;
- A technical monitoring and warning service;
- Dissemination of meaningful warnings to at-risk people; and
- Public awareness and capability to act on warnings received.[7]

With the inclusion of these four elements, an 'end-to-end' EWS can be said to be in place.

What makes effective early warning systems?

Even when communities have access to disaster risk information, this does not necessarily ensure effective and early response. In order for EWS to protect lives, livelihoods and property, they must encourage effective responses. This is more likely if:

- Early warnings can be acted on at local level in a timely manner.
- There are established response procedures, familiar to both the community and the body issuing warnings. This requires regular testing or use of the EWS.
- The community is aware of the effects of the hazard and understands the warning and forecast information
- The body issuing warnings is trusted. If a community is unfamiliar with EWS or those issuing them, it may be difficult to gain its trust. False alarms or inaccurate warnings may reduce credibility, leading to warnings not being heeded.[8]

Effective EWS require strong technical foundations and good knowledge of current and future risks.[9] EWS also need a clear understanding of local contexts and needs. Communication of early warning information to people and communities should feature clear messages, reach those most at risk and promote awareness of DRR.

A multi-hazard EWS is one that includes consideration of all hazards and community needs. As data needs for hazards are often similar, this approach can help generate systems with greater efficiency and sustainability, as well as assisting the public in understanding the range of risks faced.[10]

Summary points for consideration in Post-2015 framework for DRR

- Consider suitable options for a designated goal on EWS that promotes an ambitious rise in the number of people with access to early warning information as well as education on DRR by 2030. In particular, an emphasis should be placed on vulnerable people and groups, such as the poor, elderly, disabled and marginalised.
- Assess options for increasing the access and communication of disaster risk information through more people-centred EWS that include both hazard and impact forecasts, which is currently already helping communities take effective and early action. Multi-hazard EWS approaches can also increase awareness about the range of risks faced, as well as providing efficiency savings.
- Provide clear mechanisms for the provision of support to developing countries in setting up and maintaining effective EWS. Crucially, the framework should provide clarity on how additional financial resources to support EWS can be leveraged and managed but also coordination of technical support and knowledge transfer between developed and developing countries.
- Offer clear steps and guidance in supporting more effective communication of disaster risk information. Promote greater innovation and access to new communication technologies, as well as clarifying regional, national and local mandates to coordinate disaster response. Alongside this, the framework should encourage suitable enabling environments and incentives for EWS to be implemented by governments, civil society and the private sector as well as individuals.
- Data on the coverage of EWS are currently weak. The primary source of information is the UN International Strategy on DRR (UNISDR) National Hyogo Framework for Action (HFA) Monitor, an online survey used to report countries' progress towards the HFA Priority Areas. This has been accessible to HFA focal points since 2008 and can therefore provide the foundations for a baseline of the coverage and quality of EWS.[11] However, more can be done to ensure central coordination and standardised methods for data collection at both national and subnational levels.

1. Pearson, L. (2012) 'Early Warning of Disaster: Facts and Figures', http://bit.ly/1N93A3x
2. UNISDR (UN International Strategy for Disaster Risk Reduction) (2011) *Global Assessment Report on Disaster Risk Reduction 2011: Revealing Risk, Redefining Development.* Geneva: UNISDR.
3. UNISDR (UN International Strategy for Disaster Risk Reduction) (2015) 'Working Session Early Warning'. Draft Concept Note, 5 February. Geneva: UNISDR.
4. UNISDR (2011).
5. Practical Action (2011) 'Early Warning Systems'. Rugby: Practical Action.
6. Pearson, L. (2012) 'Early Warning of Disaster: Facts and Figures', http://bit.ly/1N93A3x
7. Practical Action (2011).
8. POST (Parliamentary Office of Science and Technology) (2005) 'Early Warnings for Natural Disasters'. London: POST.
9. De León, J.C.V., Bogardi, J., Dannenmann, S. and Basher, R. (2006) 'Early Warning Systems in the Context of Disaster Risk Management'. Entwicklung and LändlicherRaum 2: 23-25.
10. Rogers, D. and Tsirkunov, V. (2011) 'Implementing Hazard Early Warning Systems'. Washington, DC: Global Facility for Disaster Risk Reduction.
11. UNISDR (2011).

Overseas Development Institute
203 Blackfriars road
London SE1 8NJ
Tel: +44 (0)20 7922 0300

odi.org