FORUM

EARLY WARNING SYSTEMS FOR RESILIENT COMMUNITIES

Early warning systems are internationally recognized as an integrated tool for monitoring, forecasting and assessing disaster risks and helping to increase preparedness. Using them at the community level, with the active participation of local populations, can be critical for preventing risks and activating timely responses in the event of emergencies in the global South.

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A COMMITMENT TO DISASTER RISK REDUCTION

Early Warning Systems are frequently thought of, simply, as fire alarms or mobile phone alerts. They are, in fact, far more complex. The United Nations Office for Disaster Risk Reduction (UNDRR) defines early warning as 'an integrated system of hazard monitoring, forecasting and prediction, disaster risk assessment, communication and preparedness activities, systems and processes that enables individuals, communities, governments, businesses and others to take timely action to reduce disaster risks in advance of hazardous events'. The key to early warning systems, therefore, is more about their integration, as opposed to the warning itself.

On 18th March 2015, representatives from 187 national governments signed the Sendai Framework for Disaster Risk Reduction (2015–2030). In doing so, they formally committed to improving their national assessment of, and risk reduction from, natural and human-initiated hazards. They recognised and accepted that such commitments would require them to acknowledge and address risk accountability and responsibility, whilst also strengthening their national, regional, and local risk governance systems and procedures. It was agreed that early warning should be clearly embedded within national risk reduction strategies and activities.

COMMON ALERTING PROTOCOL: AN INTEGRATED APPROACH

National early warning systems depend upon trusted communication channels that have been established for risk consultation and information across all levels of society. The Sendai signatories acknowledged that risk reduction in their countries would require an 'all-of-society' approach and partnership. This would require reliable dialogue with, and across, local communities, private sector organisations and critical national infrastructure stakeholders (both national and international). Government ministries and agencies entrusted with accountability and/or responsibility for national risks or hazards were to be required to regularly consult with, and inform (and be informed by), wider stakeholders in order that national, regional, and local risk registers could remain 'alive'; relevant and actioned.

International early warning systems operate via a common alerting protocol (CAP), and include earth observation systems that use sensors and satellites to track changes in the environment, down to more national and local scales. Such systems seek to integrate huge data sets (for example the Famine Early Warning System https://fews.net), or are required to activate emergency management systems (ie raising barriers against floods or cutting off power and gas).

SOME AFRICAN EXAMPLES

Whilst such technology can provide opportunities for remotely monitoring likely meteorological and geological impacts, it is argued that community-based early warning mechanisms, that have been hard-wired into the country's risk reduction governance structures, provide a more cost-effective and efficient early warning mechanism for impending hazards, impacts and loss.

For example, the Africa Multi-Hazard Early Warning and Early Action System for Disaster Risk Reduction validated in October 2021 is a community-based early warning system that empowers local communities in the warning process, in some cases embodying traditional tribal knowledge rather than modern science. A key example of this is the Red Cross (RC) community-based surveillance (CBS) programme for epidemic preparedness which has been implemented in Indonesia, Kenya, Sierra Leone and Uganda. This comprises the systematic detection and reporting of 'events of public health significance within a community, by community members. A wide network of volunteers is selected from local subpopulation groups against key diversity criteria. These include ethnicity/tribe, gender, literacy levels and language/dialect.

Volunteers are trained to submit reports using short message service (SMS) applications, and other electronic data forms, on existing mobile phones, deployed with minimal infrastructure, within a wide range of conditions. Reports are designed also to be used by people with minimal literacy and with basic analogue phones.

Alert messages are received, and cross-checked, by supervisors. These supervisors include RC Team Leaders, RC District Staff, Vil-

lage Health Team supervisors and local government surveillance officials. Alerts are entered into a real-time database which then triggers appropriate response activities; for example, immediate volunteer and household action for basic health care, or immediate containment (to minimize the spread of infection), or rapid action by local authorities to investigate or conduct laboratory/clinical tests in order to control an outbreak.

The RC program demonstrated high levels of accuracy in Sierra Leone (96%), Indonesia (90%), and Uganda (73%). Some countries revealed lower accuracy levels however (35%) and these highlight the importance of adapting community-based early warning systems to local contexts. Nevertheless, the RC programme demonstrates an overall positive impact of timeliness in ensuring early detection and response to outbreaks.

INTEGRATED NETWORKS ARE KEY

Common challenges affecting early warning systems include trust in the response decision-making and trust in the communication protocols in place. Governments typically develop their own national concepts of operation for dealing with crises and disasters. Early warning systems should be embedded within these in accordance with the Sendai Framework. Less developed countries, however, often reach out to overseas and private sector organisations for assistance in developing such plans and systems. As a result, conflicting solutions are developed, and whilst attempts are made to adapt external training solutions to local realities, the result is often a practical hybrid of conflicting doctrines and incompatible assets.

This can frustrate the timeliness and impact of any early warning mechanism, particularly when operating within a challenging multi-agency environment. This in turn affects trust in decision making and communication. For example, the rapid arrival of international agencies and humanitarian actors as part of a bilateral, or multilateral United Nations led offer of assistance can further complicate an already complex field of conflicting decision making and lines of communication. Furthermore, many international humanitarian agencies, such as CUAMM, may already be operating within the affected country with their own well-established local relationships and communication channels within the regions and communities.

A key component of successful early warning systems is therefore improved integration between, and understanding of, national and international governmental and humanitarian networks with local communities. National early warning should be based upon long-term social processes that integrate preparedness, response, recovery, and mitigation across multiple stakeholders from local communities to national governments. International disaster response and early warning should additionally coordinate and integrate within the national early warning systems of the affected country to maximise operational efficiency and minimise disruption to established channels of situational awareness, and long-term relationships of trust and reliability.