Fact sheet

Early Warning Systems

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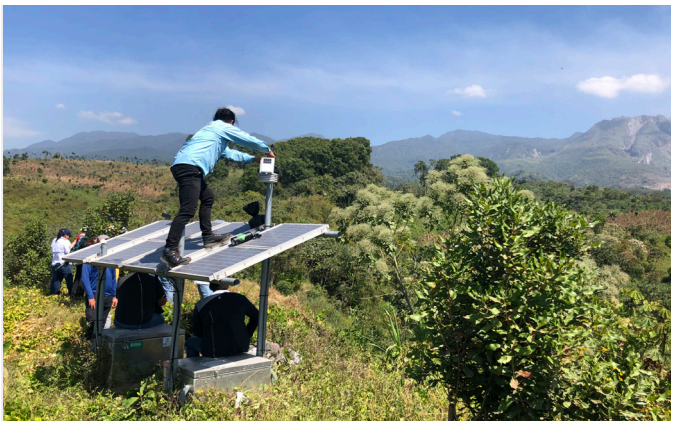
Central America is the waist of the continent, the last piece of land to emerge from the ocean. Being geologically the youngest, a volcanic chain boiling underfoot at all times poses the daily threat of volcanic eruptions. Not only that, the population may also expect earthquakes, hurricanes, floods or droughts, all of which are natural phenomena which can bring about disasters.

Therefore, an Early Warning System (EWS) is fundamental to protect lives and to the comprehensive development of the population. This can only be achieved by working closely with responsibility-bearing institutions, key actors and the people who are at risk.



Expert in vulcanology reviews and adjusts a multiparametric station. El Palmar, Quetzaltenango, Guatemala.
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An Early Warning System serves to:

- Monitor risks.
- Provide timely information on predictable threats.
- Alert sectors of the populations exposed to danger in a timely manner, so they know what to do and how to act.
- Prepare effective responses to avoid or reduce the loss of human lives, destruction of economic and social infrastructure, and damage to the environment.

For the EWS to fulfil its function, there must be in place a comprehensive plan, consisting of four components:

01 Risk knowledge	02 Monitoring and forecasts	03 Warning dissemination	04 Preparedness and response
• Threats, vulnerabilities, levels of exposure and capacities are evaluated and updated • Roles and responsibilities are defined • Risk information is consolidated	• Monitoring systems are installed • Forecast and warning systems are functioning • Institutional and procedural mechanisms are in place	• Organisational and decision-making processes are underway • Communication systems and equipment are operational • Warning dissemination so people take action	• Response plans are developed and underway • Awareness-raising and educational campaigns take place • Drills and evaluation of the response of the population to warnings

How did we organise it?

There were three stages, each with key actions and a timeline to ensure the system operates correctly:

Stage 1
Evaluation and design (2 years)

We assessed what is and what is not feasible in order to design an effective system.

What is indispensable?

- A diagnostic to learn about the existing network, equipment and training needs.
- Scientific studies and maps indicating threats, vulnerabilities and priorities of the EWS.

Stage 2
Testing (2 to 3 years)

We tested the system and made the necessary improvements. Protocols were established and channels selected by which to issue warnings.

What is indispensable?

- Evaluate the warning dissemination system and undertake awareness-raising activities.
- Strengthen preparedness and response capacities in municipalities and communities.

Stage 3
Implementation (2 to 3 years)

We consolidated and ensured good system governance at all levels. Warnings were issued to the population; the process was evaluated and improvements made where needed.

What is indispensable?

- Ensure the warning dissemination to the population through established channels.
- Routinely define and test the protocols and procedures.

What resources are needed? A technical team that analyses and designs what is to be done jointly with organised sectors of the population. There must be a person who coordinates the actions, together with expert staff in geology, seismology, vulcanology, electronics and network management, among other subjects, all with experience in EWS. In addition, partners and administrative staff must be committed to accountability, follow-up and the effective use of resources.

Who is responsible for implementation? National institutions responsible for monitoring threats and issuing warnings, in very close coordination or joint implementation with those civil protection entities responsible for issuing warnings. It is important to accompany them with specialised technical assistance and provide technical inputs that ensure good quality EWS, the adequate transfer of knowledge, technologies and capacity strengthening among local experts.

How to create a successful EWS?

1. Have available national seismology and vulcanology services and networks, in addition to experts in the various scientific fields dealing with disasters to which the territory is prone.
2. Strengthen systems governance and ensure the involvement of all actors and entities with mandates to issue warning useful for the appropriate management of human and financial resources.
3. Encourage cooperation and exchange of experience and information between EWS operators in the various countries.
4. Forge alliances with universities and specialised scientific centres, such as the Swiss Federal Institute of Technology Zurich (ETH Zurich) and the Geological Sciences Department at the National Autonomous University of Mexico, as well as volcano observatories in the region, in order to exchange experiences and increase knowledge among local experts.
5. Utilise the early earthquake warning module developed and adapted to the countries of the region by ETH Zurich, as it is inexpensive and easy to use.

This is how having EWS changed our lives ...

> “Our community now knows what risks we are exposed to. We also know what to do to protect our lives when the volcano erupts. We have not only the know-how, but also the tools and material needed to support possible evacuation measures. It is also crucial that our community is now organised to lead and guide others in case of disaster”.

Mirna Elizabeth Martínez López, director of the Local Disaster Reduction Committee, village of Las Marías, El Palmar, Quetzaltenango, Guatemala

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