

**Practical
ACTION**

Towards effective early warning systems

IMPACT AND LESSONS FROM NEPAL AND PERU

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WORKING PAPER



TOWARDS EFFECTIVE EARLY WARNING SYSTEMS

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Summary

In 2022, Practical Action commissioned an assessment to better understand the impact of our people-centred early warning system (EWS) programming in Nepal and Peru. The evidence gained is intended to inform and shape future policy and practice of EWS programming globally. Effective EWS are an essential service for protecting the lives and livelihoods of vulnerable communities at the front line of climate change. We need to take action now to ensure the investment in and implementation of EWS are effective, improve resilience, and leaves no one behind.

Recommendations

- **Recognize that people face increasing risks from multiple hazards, which are exacerbated by climate change.** Governments have a challenging and difficult responsibility to protect their citizens with EWS that address multiple hazards rather than single hazards and that are designed for longevity in the face of a changing climate.
- **Work with local communities.** Practitioners should work as facilitators to utilize local knowledge and strengths, building people's agency and providing support when there are gaps. They should actively recognize and work with differences within the community to ensure that EWS are designed to be suitable for all those at risk, not just the majority.
- **Address social inequalities through an intersectional approach to all EWS programming.** This includes going beyond binary considerations of gender, and being intentional and strategic from the beginning when designing EWS.
- **Bridge the gap between local needs and government mandates** with a view to building sustainability, achieving scale, and improving capacity in governmental duty bearers.
- **Integrate EWS within a wider disaster risk reduction and management strategy,** recognizing the implications of climate change on communities at risk and harnessing the opportunities that EWS provide as vehicles for wider social change.

Practical Action, EWS, and impact assessment

Early warnings provide an opportunity for people to take action to save lives and livelihoods, reducing the impacts of rapid onset disasters (REAP, 2022). Practical Action has been working with local partners (e.g. the Center for Social Development and Research), national governments, and other stakeholders to develop EWS for communities at risk for over two decades (Practical Action, 2020).

In 2022, Practical Action commissioned an impact assessment to understand how its EWS work has contributed to changes in people's lives. Outcome harvesting was used to collate, scrutinize, and evaluate the outcomes experienced in Nepal and Peru.

In Nepal, the assessment consulted 501 people (57 per cent women and 43 per cent men) in 15 communities that Practical Action has worked with in the lower Karnali River basin in the Bardiya and Kaliali Districts, and the Mahakali river basin in the Kanchanpur District. National level government representatives were also interviewed, including from the National Disaster Risk Reduction and Management Authority and the Department of Hydrology and Meteorology. Household surveys, key informant interviews, semi-structured interviews, and focus group discussions were used to solicit and critically assess outcome statements.

In Peru, a purely qualitative approach was taken: 51 people (49 per cent men and 51 per cent women) were interviewed from five districts in the Rimac River basin where Practical Action has worked, namely Ate, Chaclacayo, Lurigancho-Chosica, San Mateo, and Matucana. Key informants included community leaders and volunteers, local government, national actors and institutions, partners, NGOs, and Practical Action.

Early warnings provide an opportunity for people to take action to save lives and livelihoods



Women practising disseminating early warning information to local community members using a loudspeaker in Nepal

I plan to do everything in my power to save myself, my family, and community people by exchanging messages, helping people to let them know about water level rises by playing a siren, and attending training conducted by Practical Action and Centre for Social Development and Research.

Ramesh, male community member, Bardiya District

Involvement and participation of the community at risk leads to effective EWS

Practical Action's people-centred approach to EWS has had multiple impacts.

- **Improved public disaster risk knowledge and understanding.** In Nepal, two-thirds of respondents are confident that they have been able to improve their knowledge over the past five years through their engagement with EWS projects. In Peru, respondents reported enhanced risk knowledge particularly around causes, effects, and risks of weather phenomena.
- **Improved, multiple dissemination channels to share EWS messages with more people.** In both Nepal and Peru, respondents reported that they now have access to information through a range of different preferred mediums, including door-to-door, organized structures (e.g. community disaster management committees, local watch officers, community brigades), or the police. In Nepal, Practical Action successfully advocated for SMS-based messaging as a national government strategy to reach a larger population.
- **Better understanding of early warning messages.** In Nepal, 83 per cent of respondents reported that they now understand the early warning messages they receive, and messages are disseminated further in local languages through volunteer networks.
- **Improved monitoring and forecasting to support early action.** Practical Action has worked to improve the coverage of monitoring

stations and localized forecast information to address gaps in existing networks that are the result of restricted government resources and complex landscapes. In Nepal, 86 per cent of respondents were satisfied that they receive early warning messages ‘just in time’ (three to four hours prior to floodwaters reaching their community) to take the required action to protect themselves.

- **Better plans and preparation enabling people to have confidence to act.** In Peru and Nepal, respondents believe that, as a result of attending training and participating in drills, they are now equipped with appropriate tools to directly act and respond in time to future events.

The work Practical Action has done has improved the communities’ trust in the source of information, forecast skill, and themselves. In Nepal, 93 per cent of respondents believed that flood early warning information were reliable. The involvement of village chiefs and trusted local people across the system can heighten the EWS trustworthiness, particularly addressing instances of false alerts. Teams in Nepal and Peru reflected that these trusted relationships require continuous building.

For an EWS to be effective, it must result in actions taken to reduce risks (REAP, 2022). These actions can vary based on a variety of contextual, social, and individual factors, but can include the following:

- **Securing household belongings.** In Nepal, important documents are stored in emergency bags ahead of the rainy seasons and in Bangau in Tikapur, a *thati* (raised part of a house) has been built for the community to store their belongings in during floods.
- **Further disseminating messages.** In Nepal, respondents said they shared early warning message information with neighbours and others (67 per cent) and supported others to move to shelters or safer ground (23 per cent). In Peru, community monitoring volunteers also localize and translate technical forecasts and warning information for community action.
- **Protecting livelihoods and crops.** In Nepal, efforts are made to move or store harvested crops to higher ground.
- **Moving to safe spaces.** In both Nepal and Peru, respondents reported that they have identified safe routes and safe places to go to in the event of an alert. Evacuation shelters built by Practical Action in Nepal have inspired other communities to replicate them or establish temporary disaster shelters (e.g. in schools).
- **Planning for and supporting evacuation of vulnerable people,** such as the elderly and people with physical disabilities, was demonstrated in both Nepal and Peru.
- **Preparation for immediate response.** In Peru, community teams are equipped with basic first aid resources and received training to identify initial local damage and destruction to infrastructure in order to support prioritization of response.
- **Pre-positioning resources to reduce post-disaster impacts.** In Nepal, increased lead time to prepare for flooding has allowed people to store safe drinking water and food securely to protect against waterborne diseases.

However, more work needs to be done to understand behavioural factors that influence trust (Šakić Trogrlić et al., 2022) and decisions on what actions to take (Ayeb-Karlsson et al., 2019). In addition, we need to better understand the distinctions in duty bearers’ responsibilities for providing support and building capacities to take early action (Twigg, 2003) and ensure autonomy and agency of individuals.

Even if I am not able to read an early warning message, my neighbours and family members inform me about the potential flood arrival.

Guddu, female community member, Bardiya District

After receiving messages, we ... prepare one bag with essential documents, we keep all our grains and food items in safe places ... so that they won't be destroyed. We also help other neighbours—we circulate messages among others and help each other to remain safe.

Geeta, female community member, Bardiya District



Community volunteers practising supporting evacuation of people with physical mobility challenges in Nepal

Now we are capable to shift elderly and children to a safe area as we're instructed regarding safe routes and areas.

Arjun, male community member, Bardiya District

Effective governance is essential to achieving sustainability and scale

Effective governance of an EWS including legislative mandates, responsibilities, and long-term funding is required at a national level in order for government institutions to be able to set up and operate a sustainable EWS (Golding, 2022).

Factors such as government volatility, limited investment, reliance on external funding sources, and recurring disaster cycles often lead to insufficient resources (both human and financial), time, and siloed working practices in government institutions (Šakić Trogrlić et al., 2022). In many contexts, there is also a culture of emergency response rather than implementation of longer-term preparedness and resilience-building activities, as well as high turnover of staff and subsequent loss of knowledge and skill sets.

This leads to gaps in mandates, responsibilities, and funding, resulting in EWS that are not fit for purpose, including early warning messages not reaching everyone, people not understanding them or not knowing what to do, and lack of locally specific information (REAP, 2021).

Practical Action and other NGOs have worked to bridge these gaps by supporting people to reduce their risks. However, this is not a sustainable or scalable solution as civil society cannot operate everywhere, often relies on local volunteers, and is highly dependent on project funding cycles (Šakić Trogrlić et al., 2022). To partially address this issue, Practical Action works closely with duty bearers such as government agencies from the beginning and throughout EWS programming.

Gender, equity, and social inequalities need to be strategically addressed

The study anecdotally reflected on several axes of marginalization that affected people and that needed to be addressed in the design of an EWS.

- In Nepal, pregnant women and older people still faced higher risks during flooding and required additional support to enable them to respond to EWS messages.
- In Peru, there was low attendance of youth in training and participatory monitoring networks.
- In Nepal, safe shelters did not always provide the adequate warmth, sanitation, and privacy required for mothers to care for their newborns.

The study recognized that other sources (e.g. Brown et al., 2019) have demonstrated that traditional clothing, caring for children, and carrying possessions can restrict women's ability to evacuate quickly.

It should be noted that the study only mentioned a few axes of marginalization that are known to be particularly vulnerable to disasters, for example (and this is not an exhaustive list): LGBTQ+, ethnic and class-based minorities, homeless people, sex workers, and migrant populations.

Practical Action recognizes that we need to better understand the gaps in our knowledge and work, taking a more intentional approach to addressing gender, equity, and social inequalities in our EWS (Brown et al., 2019).

EWS should form part of a wider strategy to improve resilience to a changing climate

EWS facilitated by Practical Action have created big change, including impacts beyond reducing immediate effects of flooding.

- **Strengthening community networks.** In Peru, the community participatory network that was established has been used for other situations such as monitoring crime, health campaigns, and COVID-19 responses.
- **Creating opportunities for women leadership.** The community participatory network in Peru offered women the opportunity to take on leadership positions that are not traditionally available to them.
- **Improving psychosocial welfare and resilience.** In Nepal, 68 per cent of respondents reported that their psychosocial welfare has been improved by EWS.

Whilst an EWS can have a significant impact on reducing the number of lives lost, it does not fully address the myriad challenges faced by the community. The communities we work with face multiple hazards, but most of our work has focused on single-hazard EWS (e.g. floods or *huaycos*). Whilst EWS can address the vulnerability and exposure components of risk, they do not directly change the hazard itself.

We need to swim to go from one house to another. Two people from this house nearly drowned but thankfully we were able to save them. ... My wife was pregnant at that period, so it was hard for us, she could not run like others.

Jay, male community member, Bardiya District

I've been focusing on earning money and saving for future potential flood occurrences.

Madhu, female community member, Bardiya District



Women in Peru support evacuation and rescue of vulnerable community members

Every year, when it's rainy season, the agricultural crops are still swept away ... despite flood EWS ... the same cycle is repeated every year: heavy rainfall, floods, loss of land, crops, houses, and domestic animals.

Ram Aabatar Tharu, male community disaster management committee chairperson, Bardiya District

In addition, climate change is going to make this a lot worse. EWS programming provides a good entry point and a window of opportunity to tackle these wider issues. Our EWS work needs to be part of a wider suite of initiatives to build resilience, such as the following:

- **Financial safety nets (including savings and insurance).** In Nepal, 74 per cent of respondents reported saving regularly to support life events (such as marriages and funerals). However, only 28 per cent reported saving deliberately for possible emergencies. In Nepal, respondents noted that sown crops remain at risk of being damaged or destroyed, which EWS cannot address, but only 3 per cent of respondents reported insuring assets including crops.
- **Diversification of livelihoods.** In Nepal, only 26 per cent of respondents have adapted to make their agricultural livelihood resilient to floods. Employment skills and income diversification are needed to ensure resilient livelihoods.
- **Interventions that directly reduce hazard impacts.** Nature-based solutions can directly reduce hazard risks, and have multiple socio-economic benefits for local communities to support longer-term resilience and development (Sneddon, 2022).



Improved risk knowledge from EWS activities can contribute to better decision-making to reduce risks from disasters

Call to action

The evidence presented in this document supports existing demands for people-centred, effective EWS to reduce risks from disasters and save lives and livelihoods in order to build people’s resilience to a changing climate.

These EWS need to go beyond considering the majority, and need to be intentional and strategic about working with and for marginalized people, taking an intersectional approach and going beyond binary considerations of gender.

In addition, we need to be intentional about continually striving towards an institutionalized and sustainable system to achieve impact at scale. EWS are an essential service and not a ‘nice to have’, and governments have a duty of care to provide them for their citizens.

EWS programming needs to be part of a wider suite of initiatives to tackle the root causes of disasters and build resilience to a changing climate.

Climate change means we need to take action now to ensure that the investment in and implementation of EWS are effective, improve resilience, and leave no one behind.

The main change I think is that we have generated a set of people in civil society who can now, based on understanding the context of the risk they are in etc., make a different demand on the authorities than they had before the project. I think that’s the crucial thing.
Male field staff, Practical Action, Peru

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About Practical Action

We are an international development organization putting ingenious ideas to work so people in poverty can change their world. Our vision is for a world that works better for everyone.

We help people find solutions to some of the world's toughest problems, including challenges made worse by catastrophic climate change and persistent gender inequality.

We believe in the power of small to change the big picture. And that together we can take practical action to build futures free from poverty.

Big change starts small

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