Challenges and innovations in operational flood and landslide early warning systems in Nepal, Peru and India

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Effective early warning systems (EWS) are people centred, ensuring appropriate early warning reaches the last mile, including the most vulnerable. An effective and sustainable EWS considers and is designed to meet the needs, capacities, constraints, and priorities of all people, enabling appropriate and timely early action to save lives and reduce losses. However, barriers and challenges remain in embedding early warning systems within existing governance structures, effectively operationalising the system from end-to-end, ensuring sustainability, legacy and ownership, and disseminating and communicating often complex warnings to communities and individuals at risk.

In this session, Practical Action will share our experiences piloting and helping to scale operational flood and landslide early warning systems in developing countries. The focus of the session will be on two case study examples in Nepal and Peru; we will also reflect on how these lessons can be taken forward into other natural hazard early warning systems, such as a landslide EWS in India, piloted under the Science for Humanitarian Emergencies And Resilience (SHEAR) programme.

In Nepal, research was undertaken to analyse and understand the current flood early warning system, considering available data and forecasts, information flows, early warning dissemination and decision making for early action. Simple early warning systems rely on real-time data and deterministic models to generate evacuation warnings; these simple deterministic models provide limited lead time for early action. More complex early warning systems supported by forecasts including probabilistic forecasts, can provide additional lead time for preparation. The research reviewed the availability, access, and utilisation of these complex forecasts in Nepal during the 2017 monsoon, their integration into dissemination (bulletins and SMS warnings) and decision support tools (Common Alerting Protocols and Standard Operating Procedures), considering their impact on improving early action.

In Peru and Nepal, research was undertaken to examine the gender dimension of early warning in existing systems in Peru and Nepal, particularly identifying the different needs, challenges, and opportunities for gender-responsive early warning systems, and sharing lessons of success (and failure) to ensure a truly gender-sensitive and gender-inclusive early warning system. Gender is a critical consideration in ensuring effective Early Warning Systems leave no one behind. However, limited research has focused specifically on the connection between gender and EWS, and there is a shortage of evidence on best practices to ensure EWS are effective for all. Five themes emerged from the research, into which gender related findings and recommendations have been grouped. These are vulnerability; participation; dissemination; response; and power and decision making.