



## **Building rural resilience in seismically active regions: Combining local and outside knowledge for effective risk reduction**

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In recent years there has been a significant shift from top-down, response-led approaches to disasters to disaster risk reduction (DRR), with emphasis placed on vulnerability reduction and resilience building at the local level. In order to achieve DRR a multidisciplinary approach is required which addresses both the geophysical hazard and the underlying vulnerability of those 'at risk'. However, moving from theory to practice presents a significant challenge. Despite significant developments in our scientific understanding of earthquake hazard, there has not been a corresponding reduction in earthquake fatalities. Similarly, bottom-up, community-based or participatory approaches to disaster risk reduction have highlighted that local knowledge alone is not enough, particularly in the context of building resilience to rare, high-magnitude events where supporting expertise and resources are required. This has led to calls for a more collaborative approach to disaster risk management which combines both local and outside scientific knowledge. We seek to elucidate the interface at which scientific and local knowledge meet, and how this juncture varies by event scale, frequency, extent and longevity in seismically active margins.

This study seeks to address this call by bringing together local communities and physical and social scientists in a peri-urban and a rural setting in the Central Development Region of Nepal. Through an iterative set of household surveys, focus groups and participatory exercises, including transect walks, ranking and mapping, the study sought to: (1) develop an understanding of the concerns of the community and their perception of earthquake hazard, including the identification of knowledge gaps (from the perspective of both lay people and outside scientists); (2) to explore a set of co-produced solutions or coping strategies that communities might use to enhance their resilience to rare but potentially devastating high-magnitude events; and (3) to identify any barriers to their implementation or research gaps that need to be addressed before they can be implemented.

The findings highlight a disconnect between the priority concerns for local communities and outside scientists. While scientists focus on high-magnitude, low-frequency geophysical hazards, communities focus on their immediate, everyday livelihood concerns, a stark reminder that any outside intervention aiming to reduce the vulnerability of communities to seismic hazards must be sensitive to wider development and livelihood needs. We seek to gauge and inform the scientific understanding of geophysical hazards through lay knowledge of those frequent events which cumulatively have high impact, and the lay knowledge of extreme events, their impacts and timing. By bridging these two communities we aim to define a new pathway for future DRR research, which seeks to identify appropriate co-produced solutions that are sensitive to local needs, yet are firmly based upon scientific knowledge of event characteristics, such as catastrophic impacts or recurrence, which commonly instil only a very faint impression within traditionally held seismic culture.

**Key words:** Disaster risk reduction, earthquake, landslide, vulnerability, interdisciplinary research.