

## CASE STUDY

### Fostering demand for safer schools

**Country:** Nepal

**Organisation:** National Society for Earthquake Technology-Nepal

**Hazards:** Earthquakes

**Summary:** Nepal has a history of destructive earthquakes but until recently had done little to protect its infrastructure and housing. Then, the National Society for Earthquake Technology-Nepal (NSET) began a host of projects to raise national awareness through safer construction practices. Through community mobilisation, NSET started a public dialogue about the imminent threat of earthquakes and offered tools to the community to help them be more resilient. NSET encourages the community to connect with outside funding sources so costs are shared. In all projects, they work to identify which school projects are most likely to scale-up the program in their communities and protect more Nepali children and adults.



**Update:** On April 25, 2015, Nepal experienced an M7.8 earthquake 77 kilometres northwest of Kathmandu. Because the earthquake struck at noon on a Saturday, few were inside the thousands of classrooms that collapsed. Tragically, some teachers were attending teacher training sessions and were killed. At the time of printing, a full education sector damage assessment had not been completed. Early assessments indicated over 10,000 classrooms were fully damaged and upwards of 90 percent of schools damaged in some districts.

### Country and hazard overview

Nepal is beset with high seismic activity. They have weathered four major earthquakes in the last 100 years, which have claimed more than 11,000 lives. In 1934, the Nepal-Bihar earthquake claimed 8,519 lives and caused massive devastation to Nepali infrastructure and housing. Extending all the way to 1250 CE, the seismic record suggests earthquakes of that size occur approximately every 75 years. If historical trends continue, another earthquake is imminent. Smaller and more frequent earthquakes serve as constant reminders of the looming threat.

### Mobilising communities

NSET were pioneers of community-based safe school construction in Nepal. In 1993, the organisation consisted of just a few people and little more than an idea. They wanted to build awareness about earthquakes and other natural hazards from the children up, and at the same time use a school construction project to bring about earthquake-resistant construction practices.

Mobilising communities to build safer schools can require lengthy engagement and trust building. A mix of low risk-awareness, limited government capacity and limited resources drove NSET to focus on finding sites for a few successful projects. Their aim was to ensure the government, as a key stakeholder, repeatedly saw community-based safe school construction projects as an effective means to protect children, provide education, teach masons new skills and, by extension, protect Nepali people and vital infrastructure investments.

### School selection criteria

- High community commitment
- Potential for publicity
- Replicability
- Enrolment
- Feasible socio-economic condition
- Availability of construction materials
- Potential for training

Selecting a school was done with care. For example, in Nawalparasi District, all of the district's 239 schools were surveyed to see which schools needed new classrooms. The number of available local masons was assessed, along with the socio-economic condition of all communities and the available construction materials. Through an analysis of these quantitative factors, NSET made a shortlist of around 20 schools.

The most resource-intensive and time-consuming part of strategically selecting a site was determining which communities would most benefit from a project. It was decided the benefit would be higher in communities that did not even know they were particularly vulnerable or that their vulnerabilities were preventable. Benefit would also be high in communities where local contractors or masons failed

to follow earthquake provisions mandated by the building codes because they could not read the codes. NSET was more likely to choose these communities, but only if they showed potential for sustained community engagement.

Community engagement began with town hall meetings where community members were invited to learn about hazards and earthquake technology. At first attendance was low, but as the few attendees chatted with their families over dinner, tea and at other gathering points, involvement increased. Potentially saving children from harm in the next earthquake proved an effective conversation piece.

Once the initial novelty of the information wore off, sustaining the interest and commitment of the community's stakeholders was a challenge. NSET, along with community members, organised shake table demonstrations to continue conversations and demonstrate the effectiveness of hazard-resistant construction.

## Shake table demonstration

Shake table demonstrations are now widely used for teaching school communities and local masons about the effectiveness of earthquake-resistant technology. Typically, two one-tenth scaled models – that look like the local school – are placed side-by-side on an apparatus that partially simulates the movement of real earthquakes. Although the external design of both models is the same, one of the models has earthquake-resistant features and one is a replicate of current building practices. As the table vibrates, the community simultaneously witnesses the potential destruction of their own building, while they are given hope through the model that withstands the quake scenario.

Out of all the schools surveyed in the Nawalparasi District, Kalika Secondary School was finally chosen. Community members were low- to middle-income, meaning there was potential for donation from the wealthier community members and deep interest in a safer school. The local government was also an eager partner.



*In Nepal's Nawalparasi District, NSET engineers answer questions at a shake table demonstration. Onlookers learn their traditional building may collapse in earthquakes, but that small changes in their construction practices can save their schools and their lives. Photo: NSET.*

## Funding and retrofitting

NSET requires communities to gather almost all the funding required for a school construction project. Challenging as that may seem, their exacting method for choosing

communities helps make sure that community demand is very high before initiating the project. However, they do not leave schools to operate alone.

At the Kalika Secondary School, NSET facilitated the formation of community-based organisations (CBOs) that would spearhead school retrofit activities. NSET representatives accompanied the funding CBO to request donations from the community and district-level government offices. Again, in the company of an NSET representative, the CBO went to the steel manufacturer asking for a tax-deductible donation, which would be part of the steel company's corporate social responsibility. As those negotiations began, NSET started to mobilise in-kind contributions of sand, boulders and bamboo that would eventually be necessary in the construction project. After developing a presence in the area, they were also able to secure some funding from a local NGO to support the project.

NSET also maintained a consistent presence during construction. NSET engineers remained on the construction site throughout the process, providing on-the-job training for local masons. Trainings were not only focused on how to construct for earthquake safety, but on why the changes produce safer school buildings.

After training masons, and tearing down one of the school buildings, a new three-story building was completed in 2010. Since then, around 60 percent of the construction completed by the trained masons has included earthquake-safer technology. NSET has seen masons tear down sections of their work when engineers point out deviations from the safer methods.

## Challenges to this approach

Communities often resisted new construction practices at first. The initial scepticism made financing especially difficult. Constructing a high-quality building was expensive, and NSET wanted the school to either contribute directly or be involved in gathering funds from other sources. Garnering the support and demand for the project took time before community members were willing to plunge into the project and provide time-consuming support. However, after decades of work the region, Nepal's MoE now fully supports the community-based approach (see *In context: Working towards a culture of safety* in the *Post-Construction Stage* section).

## Key takeaways

- Although adequate mobilisation can be time consuming, it can make drastic differences in project feasibility and procurement.
- Allocating a large proportion of resources to project selection can be useful when project goals include a focus on scaling-up.
- Raising community awareness through demonstrations and public forums can generate invaluable conversations.
- Shake tables are a particularly powerful tool for creating community interest and demand for safer construction.
- If communities lack the resources to build a school, and they lack the skills to gather the funds from outside sources, implementing agencies can facilitate conversations with public and private groups that may be willing to make donations.