

Iran**Demonstrations and Training to Raise Community Awareness and Build Capacity for Safer Housing in Bam**

The city of Bam in Iran was struck by an earthquake on 26 December 2003 that killed more than 30,000 people, rendered more than 75,000 people homeless and severely damaged or destroyed about 85% of the houses, commercial units, health facilities and administrative buildings in the city and surrounding villages. The huge loss of life in the earthquake, which was of moderate intensity, is considered to be due to unsafe houses. It is widely acknowledged that prevailing construction practices were not compatible with the seismic hazard faced by the area. Despite the serious effect of earthquake-caused disasters on the development of the country there is still a lack of effective implementation of preventive and mitigation measures though technological knowledge. Building a culture of safety in communities is a major challenge for disaster risk reduction in Iran.

In November 2004, the United Nations Centre for Regional Development Disaster Management Planning Hyogo Office organized a shake-table demonstration and workshop jointly with Citizens towards Overseas Disaster Emergency (CODE), the National Society for Earthquake Technology Nepal (NSET) and other partners in Bam aiming to influence the reconstruction of the city with due consideration given to the risk posed by natural hazards. The workshop and demonstration were timely interventions for effective reconstruction as this was about to commence after 10 months of temporary housing following the disaster. A surge of outside support is usually seen in most disaster sits, including international aid during the emergency phase and exit as soon as victims are housed in temporary shelters. However, there is a real need for continuous support to ensure effective reconstruction enriched by international experience. This is particularly important in regard to the reconstruction of residential dwellings as any weakness or shortcomings will result in potential risk from subsequent earthquakes, which are inevitable at this location in the long run. The consequences of such bad construction have resulted in bitter experiences worldwide, including in Gujarat in India. To this end, the initiative aimed to show people how they can reconstruct their houses in line with earthquake-resistant systems with due respect to their own culture of housing construction. An improvised shake-table demonstration, on-the-job training of masons during construction of model houses, and a workshop on “promoting safer housing in Bam” were the components of the project. The project intended to bring the experience of previous earthquake rehabilitation in different parts of world to Bam. The easy-to-understand demonstration of earthquake-resistant building systems through an improvised shake-table test has the objectives of both raising awareness among ordinary people and appropriate technology transfer through technicians such as masons.



Figure 1: Local masons at on-the-job-training for earthquake resistant construction

The shake-table test demonstration had two components: (1) training masons by involving them in preparing the model houses, and (2) demonstration of the test in a public exhibition. Two 1/10th scale building models were prepared by local masons under the supervision of expert masons from Nepal. Of the two similar models, one was constructed by using conventional local methods without any earthquake-resistant features, and the other was an improved version of the same building with simple earthquake-resistant elements such as vertical reinforcements at corners and junctions and horizontal bands at various levels. Both model buildings were built in the typical local style prevalent in Bam.

During the process of constructing the models, which took about one month, local masons were trained on the job in earthquake-resistant systems. At the time of the test demonstration, those masons and other technicians, engineers, students and teachers, local government officers, NGO workers, community leaders, government officers and ordinary people were present. In the demonstration, the two buildings were subjected to a number of cycles of shaking as if they were experiencing the tremors of an earthquake. During this shaking, cracks began to appear in the conventional building, which increased along with the level of shaking and eventually led to its complete collapse. However, the model building with earthquake-resistant elements was in no damage and remained in position after the other one had already collapsed.

The demonstrations were found to be extremely effective in convincing common people, local craftsmen and the authorities of the importance of including earthquake-resistant features in housing construction. Most importantly, the demonstrations increased the confidence of people preparing to build houses in the simple techniques of making housing safer.



(a) Before shaking



(b) During shaking

Figure 2: Improvised shaking table demonstration

- Background

Over 70% of the houses in Bam are reported to have been destroyed in the last earthquake that occurred on December 26, 2003. The collapse of houses is considered to be one cause of the high number of casualties and injuries. People have realized that earthquake-caused disasters can only be reduced if people are well informed and motivated with regard to a culture of safety, and this requires confidence-building among citizens on the use of earthquake-resistant techniques.

- Objectives

The objective of the project were

- to impress upon people the consequences of living in seismically unsafe houses;
- to enhance their understanding of the performance of simple structures with and without earthquake-resistant features under the impact of an earthquake;
- to build peoples' confidence in earthquake-resistant building technologies, including the retrofitting of existing houses.

- Time Frame

August 2004-November 2004

- Activities Undertaken

- On-the-job training of masons on earthquake-resistant construction of residential buildings.
- Improvised public shake-table test demonstration on a pair of models, one conventional and another improved with earthquake-resistant elements.
- One-day workshop on promoting safer housing in Bam.

- Major Achievements

- Trained masons for earthquake-resistant construction.
- Raised public awareness on safety of houses.

The most important achievement was the promotion of culture of safety during the rehabilitation process of Bam City.

- Total Budget

US\$ 20,000 (Twenty thousand US\$)

- Contact Details

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