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CAPACITY BUILDING FOR SEISMIC RISK REDUCTION IN DEVELOPING COUNTRIES

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ABSTRACT

This paper sets the scene for a conference session on capacity risk reduction in developing countries. Four presentations cover a range of topics, beginning with recent capacity building activities in India. This is followed by information about a recent initiative from Peru where new adobe houses are reinforced by Geomesh. Next, the contribution the World Housing Encyclopedia, with its international scope, is making to risk reduction is discussed prior to a paper introducing, from a Japanese perspective, the lessons learned while disseminating technologies of seismic resistant non-engineered houses. The final presentation considers strategies for disseminating the best seismic resistant approaches in Indonesia.

Introduction

Capacity building for seismic reduction is an extremely important topic. As witnessed by large losses of life and property damage in the recent Sichuan Earthquake, China, and the Padang Earthquake, Indonesia, the level of seismic risk in many developing countries is very high. This is due to both vulnerable building stock and high levels of seismicity.

Capacity building occurs at many different levels. First, at an international level, the International Association of Earthquake Engineering (IAEE), seeks to build capacity through its World Conferences, held every four years. Although their content and focus are not on developing countries, some delegates from these countries are sponsored and many others find ways of attending. As well as sponsoring conferences IAEE has also supported the World Seismic Safety Initiative (WSSI), initiated in 1992, with its three goals of awareness, training and implementation. These high-level capacity building efforts are where research findings and state-of-the-art, rather than common-place seismic design and construction approaches are presented.

Also at an international level, but at a more practical level, the World Housing Encyclopedia (WHE) contributes towards capacity building. Its two approaches consist of first, developing an extensive although by no means complete database of world housing types, and secondly, by growing its range of tutorials. These tutorials offer very considerable potential for capacity building as they consist of technical guidelines containing information regarding seismically safer design and construction. As well as these efforts, several NGOs and government

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organisations have international reach and developing country focus. Geohazards International is actively involved in capacity building in different ways, from the production of seismic damage mitigation guidelines to the training of local masons in seismic resistant construction. The Japan International Cooperation Agency (JICA) is but one of many governmental organisations who are engaged in seismic resistant capacity building in various developing countries.

National initiatives represent the next level of capacity building. Many developing countries have their own national societies of earthquake engineering or equivalent but they tend to lack the resources to have much impact. However there are exceptions, such as the National Society for Earthquake Technology-Nepal and the National Information Centre of Earthquake Engineering, based in Kanpur, India. It gathers educational and professional resources as well as publishing many documents that cater not only for professionals but also for lay people. In addition it runs courses for civil engineering post-graduates and architectural students as part of its active seismic knowledge dissemination programme.

At a smaller scale, institutions particularly but not exclusively within developing countries are making significant contributions towards capacity building. These contributions not only take the rather obvious form of education, but consist of research and development. For example, over many years the Catholic University of Lima (PUCP) has undertaken research into improving the seismic resistance of adobe construction. After considering a wide range of possible reinforcing solutions one of the most promising, from economic and seismic performance criteria, is the confinement of adobe walls by Geomesh. Simple construction guides accessible to local masons and even self-builders have been published. In Indonesia, one of its universities has taken a capacity building initiative by translating the WHE tutorial “At Risk: the Seismic Performance of Reinforced Concrete Frames with Infill Walls” into Bahasa Indonesia. There are no doubt many other examples of where universities, similar institutions, and even individuals have developed and disseminated this type of information.

While several examples of capacity building have been presented, the reality is that these are hardly scratching the surface of what is required to have most people occupying seismically-safe houses and buildings. The challenge is to do all we can to improve and develop capacity building world-wide.