Assessment of a city's urban risk

Estimation of the potential damage that would be caused by a hypothetical earthquake was carried out in a theoretical step and a non-theoretical step. The theoretical estimation was performed by combining the seismic intensity distribution, estimated for the hypothetical earthquake, with the inventory of the city's structures and infrastructure. This combination was performed using vulnerability functions (see figure 2) developed to reflect the seismic behavior of the city's structures and infrastructure.

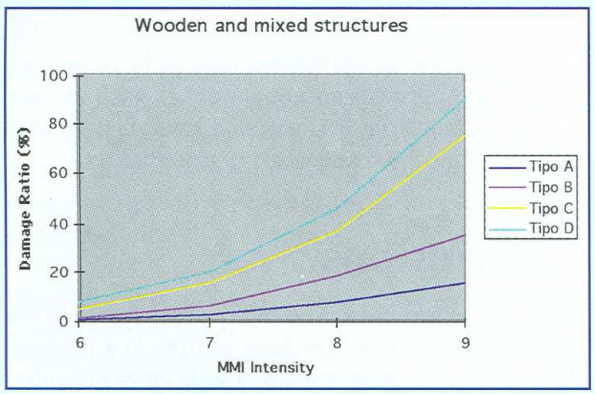

Figure 2. Example of vulnerability functions for the estimation of building damage. ("Tipo" = "Type")

Figure 3. Example of an interview with officials in charge of the city services.

Figure 4. Some of the participants of the scenario workshop in Zigong.

The non-theoretical estimation was performed through a series of interviews (see figure 3) with those responsible for the city's systems and services. The information collected in these interviews allow for the characteristics of the city systems to be included in the damage estimation.

The results of the damage estimation were used to prepare a preliminary earthquake scenario that was presented and discussed by representatives of the various sectors of the community during the scenario workshop (see figure 4). The information produced in the workshop was then used to prepare the final version of the earthquake scenario that was distributed to the community.

The guidelines describe in detail the following steps of the risk assessment process:

- Preparation and data collection
- Kick-off meeting to introduce the project to the community
- Hazard assessment
- Vulnerability assessment
- Damage estimation (theoretical)
- Damage estimation (non-theoretical)
- Preparation of the earthquake scenario
- Implementation of the scenario workshop
- Dissemination of the earthquake scenario

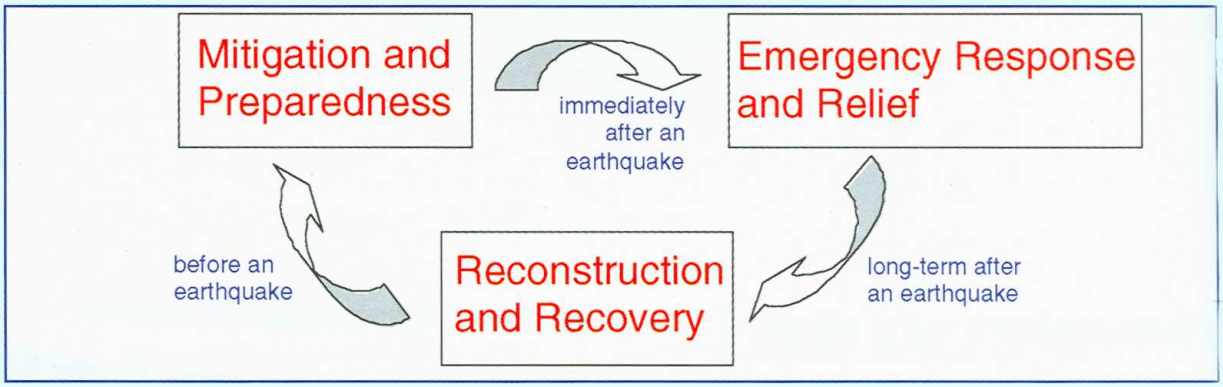

Figure 5. The planning phase considers all the stages of the "disaster cycle".

Preparing a plan to reduce seismic risk

The results of the damage estimation and the ideas for risk management activities produced during the scenario workshop were used for the preparation of an action plan that, if implemented, would reduce the city's seismic risk. Regular working meetings were held with the institutions that would be in charge of implementing risk management activities in order to define the objectives, tasks, schedules, and budgets of the activities to be included in the plan.

These activities address the three stages of the disaster cycle. These stages are the following: (a) pre-disaster, when preparedness and mitigation are important; (b) during and immediately after the disaster, when the emergency response capability is depended on; and (c) post-disaster, when the city's capability to recover in the shortest possible time from the disaster is most important. A preliminary action plan was prepared for presentation to the community during the action plan workshop.

The results of the workshop were then used to prepare the final version of an action plan that was submitted to the city authorities. Summaries of the plan were then prepared and distributed to the community.

The guidelines describe in detail the following steps to prepare a risk management plan:

- Assessment of the current level of risk management preparedness
- Formulation of risk management activities
- Formulation of a strategy for implementation
- Designation of the institution that would implement the plan
- Implementation of the action plan workshop
- Preparation of an action plan
- Publication and dissemination of the action plan

Implementation

Besides describing the main activities of risk assessment and planning, the guidelines discuss how to set up the conditions that will allow these activities to be implemented. The following are among the suggestions presented by the guidelines:

- Involve all sectors of the community through the selection of a representative local advisory committee and the implementation of well-attended workshops;
- Inform the community about the project through collaboration with the local media to keep the community informed on the advances and achievements of the project; and
- Approach potential donors such as local industries, financial and insurance sectors, and international aid organizations.

Conclusions

Since these guidelines will be widely disseminated by the United Nations, they have been written in a language that can be easily understood by a wide range of readers including local governments, the technical community and the general public. While these guidelines are expected to provide valuable information for implementation of risk management projects, readers should keep in mind that there are many other technical, financial, institutional, political, and even circumstantial requirements that need to be taken into account.

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