

Urban Seismic Disaster Prevention and Management for the Tehran Area

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1. Introduction

This paper intends to introduce the master plan study on Urban Seismic Disaster Prevention and Management for the Greater Tehran Area (hereinafter called “the Study”). The Study is carried out under the technical cooperation scheme of Japan International Cooperation Agency (JICA), one of the implementation bodies of Japan’s Official Development Assistance (ODA). The Study was initiated in August 2002 and it will continue until September this year.

The objectives of the Study are to formulate a master plan and its implementation plan for urban seismic disaster prevention and management for Tehran City and to transfer skills and technical knowledge to counterpart personnel. The Study will formulate three types of plans according to management stages: disaster prevention and mitigation, emergency response and recovery and rehabilitation plans. Implementation plan on the master plan is prepared based on these three disaster management plans.

2. The Master Plan Study in Seismic Disaster Management in Tehran

The lives and properties of the citizens of Tehran are being made safer from a potentially devastating earthquake by formulation and implementation of a comprehensive disaster management plan. The goal of the master plan is to establish a safe and secure urban environment against a potential earthquake.

The Study is divided into three phases: data collection and analysis, formulation of master plan and formulation of action plans. Study schedule is shown in Figure 2.

1) Seismic structure measures for the existing building

In order to reduce the earthquake damage, reinforcement of the existing buildings should be recommended for immediate action. The Study Team carried out seismic resistance survey on building investigation for 350 buildings in Tehran.

The Japanese seismic resistance method is applied in the analysis of the seismic resistance capacity on the existing buildings.



Figure 1. Key Map

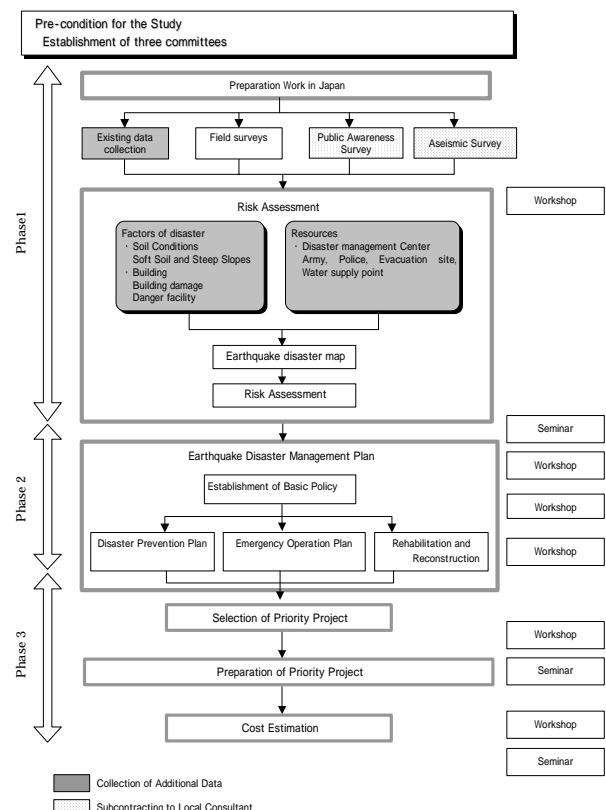


Figure 2. Study Schedule

Key Word Urban Disaster Management, Seismic Disaster Management

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A concept of Japanese building diagnosis system called “Specification on Earthquake Resistance Diagnosis and Strengthening for Governmental Buildings” is adopted and the design earthquake is given based on the “Iranian Code of Practice for Seismic Resistance Design of Buildings Standard #2800”. Japanese specification provides the seismic index of structure, *GIs*, in order to evaluate the seismic-resistant capacity of building. The results of the analysis show most of the buildings should be strengthened or rebuilt because of insufficient earthquake-resistant capacity.

2) Preparation of disaster management map and diagnosis sheet for each district

In order to assess vulnerability of each district, district diagnosis analysis is carried out. The diagnosis analysis should identify the disaster resources and hazard. As for earthquake hazard, the results of the microzoning study were applied and the additional data collection on disaster management resources was carried out in this Study. The results of analysis are compiled in district disaster management map and district diagnosis sheet for each district. Those analysis results will be utilized for each district government to formulate a disaster management plan. An example of the map is shown in Figure 3.



Figure 3. Example of District Disaster Management Map

3) Community level activity for the disaster management

Several workshops were held by the Study Team to involve residents in Tehran to disaster management planning. Those workshops were the disaster management map-making at community level and community level disaster management plan formulation by the residents. The Study Team monitored their activity to guide them in the appropriate direction.

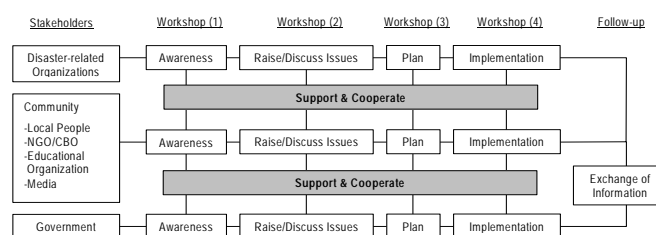


Figure 4. Community Workshop

3. Preliminary Findings

The preliminary findings of the master plan study include the following points:

- Buildings in Tehran are composed of steel structure, reinforced concrete and masonry structure, which shared more than 60% of total buildings. The seismic resistance capacity of buildings in Tehran is extremely weak. It is estimated that more than 55% of buildings will be heavily damaged under the scenario earthquake.
- The central part of Tehran Municipality exhibits a vulnerable urban environment, with inappropriate evacuation space and accumulation of weak buildings. It is required to implement area-wide development.
- Public awareness against earthquake is very low and community activities are limited by many reasons.

4. Conclusion

The Study will formulate an action plan in the next stage. The preliminary focus on the recommendation will be strengthening public and residential buildings. Improvement of the building inspection practice for new building construction is essential for Tehran Municipality. However, those proposals are limited by the investment capacity of the governments as well as private owners. Therefore, it is required to introduce a new scheme for building quality improvement. Finally, we would like to express our sincere appreciation to JICA for financing this project.