

Sound Practice No.1

An Earthquake Master Plan for Istanbul

Overview

Following the disastrous earthquakes that struck Turkey in 1999 and realizing the high probability of occurrence of a large earthquake that may impact once again important urban areas of the country (65% during the next 30 years)¹, the authorities decided to put in place a comprehensive disaster risk management system that incorporates preparedness, mitigation and emergency response procedures, as means to reducing future potential losses and overall risk in the city of Istanbul.

In an effort to count on a strategic document to initiate concrete actions to reducing physical, social and institutional vulnerability, the Istanbul Metropolitan Municipality (IMM), asked four leading technical universities: Bogazici, Istanbul, Middle East and Yildiz Technical Universities, to prepare an the Earthquake Master Plan for Istanbul.

These efforts will be pioneering examples of Urban Development Projects and Local Transformation Programs, or total “Action Planning” for Turkey. The four universities that took part in the project have set up several working groups consisting of expert faculty members, and approached the project with such a perspective and studied in detail the works to be done for earthquake preparedness of Istanbul.

An important aspect to be covered by the Master Plan is decided to be the assessment of seismic vulnerability of existing building stock in Istanbul, the development of seismic retrofitting methods and the determination of technical,

¹ Metropolitan Municipality of Istanbul, Earthquake Master Plan for Istanbul, executive summary, 2005

social, administrative, legal and financial measures to be taken in order to be able to implement such methods. In the Master Plan the works to be done in these fields are examined and the recommendations about the measures to be taken are given.

The scope of Earthquake Master Plan for Istanbul comprised of works to be done in the following areas:

1. Assessment of current situation
2. Seismic assessment and rehabilitation of existing buildings
3. Urban planning issues
4. Legal issues
5. Financial issues
6. Educational issues
7. Social issues
8. Risk and disaster management issues

The master plan aims at planning of the activities in these fields, preparation of implementation programs, and identification of the responsibilities and responsible authorities for earthquake disaster mitigation activities to be carried out in Istanbul.

Significant Background Information

History

As professor Polat Gulkan refers², in many Turkish municipalities, particularly in those where rapid economic growth is observed, including Istanbul, the zoning ordinances and master plans prepared by the town planning departments have been overtaken by the dynamics of urban growth. Changing circumstances have occurred faster than planning responses could be put into action. This resulted in a planning environment that follows, rather than directs, patterns of urban

² Gulkan Polat, Managing Urban Risk through Enhancing the Resilience of the Building Environment, Proceedings of the third Earthquakes and Megacities Workshop, Shanghai, 2000

development. Zones defined in master plans could not be maintained as their intended categories, with many zones being transformed into ill-defined mixed-use areas.

Even further removed from the formal planning process are the informal settlements where almost no building quality measures can be enacted. In many metropolitan areas the most dangerous sites, steep and unstable hills, stream gullies, riverbeds and environmentally hazardous areas have been covered with runaway settlements. The human and material losses of a severe hazard affecting these areas are likely to be very high. Populist policies for “pardoning” owners of illegal tenements just before local or national elections are due to take place have only served to exacerbate the risks that these settlements represent.

In addition, the legal and institutional arrangements dealing with Disaster Risk Management and Emergency Response appeared to be weak when faced to a severe event such as the 1999 Earthquake and did not really facilitate the process of immediate response and recovery, let alone any prevention and mitigation actions that should have been put in place given the likelihood of strong a severe shaking in the region.

SIGNIFICANCE

The magnitude of the physical devastation and huge human toll confirmed once again the high vulnerability of the buildings and infrastructure in Istanbul due to inappropriate use of materials and technologies used in the construction process. The Republic of Turkey was then compelled to take concrete steps to institutionalize efforts towards disaster mitigation.

The Master Plan includes assessing the seismic vulnerability of the existing building stock in Istanbul, developing seismic retrofitting methods and identifying technical, social, administrative, legal and financial measures needed to implement such methods. Further, it suggests a strategy to get things done in a progressive but sustained manner through the following activities:

- Assessment of current situation
- Seismic assessment and rehabilitation of existing buildings
- Urban planning issues

- Legal issues
- Financial issues
- Educational issues
- Social issues
- Risk and disaster management issues

IMM aims at planning and implementing these programs by identifying those key authorities and officials responsible for earthquake disaster mitigation in Istanbul.

As Prof. Mustafa Erdik suggests³, existing legal system can create obstacles in the application of these Strategic Plan since a number of legal reforms would be required:

1. The duties and responsibilities of some of the institutions are to be reorganized.
2. Institutional bodies are to be empowered to make the independent control mechanism
3. Local authorities, including metropolitan municipalities and regional seismic commissions, are to be empowered to assess disaster risks and prepare strategic plans and programs.
4. The issues concerning the preparation of various maps and other related documentation for disaster management are to be identified in the legal framework.
5. The financial models and their instruments proposed by the planning and finance working groups are to be specified within the legal system.
6. Various applications of exchange of property rights' and alternative compensation mechanisms in planning operations should be developed

Similar Attempts at Remediation

This is the first time that IMM is looking at a global approach to reducing the impact of earthquakes in the city. In the past different interested groups have addressed portions of the problem, particularly in the engineering and urban planning fields. The active participation of different stakeholders providing a

³ Erdik M., Istanbul Master Plan, Bogazici University, 2005

holistic approach and vision is what it turns this initiative into a powerful one.

Sound Practice Details

The Earthquake Master Plan for Istanbul provides two different yet parallel approaches with corresponding strategies and new organizational structures. A Strategic Plan for Disaster Mitigation in Istanbul (SPDMI) suggest a threefold roadmap which applies different strategies, planning instruments and priorities at macro-level, mezzo-level and micro-level. Contingency plans and actions plans are developed on the basis of the definitions of risk sectors in all fields. Macro-level strategies are shaped in the national strategic plan, regional plans, in the SPDMI, and the metropolitan master plan. These strategies are elaborated for urban redevelopment or project areas at mezzo level.

Micro-level decisions are implemented through the designation of urban redevelopment ignition areas, local redevelopment areas and land readjustment areas. At this level, development, redevelopment, rejuvenation, regeneration or implementation plans are produced depending on the characteristics of each area and the planned strategies at macro and mezzo levels.

Besides the mitigation of earthquake risk, this plan's secondary goal is the improvement of urban life quality. The approach to the earthquake problem is holistic in nature, i.e. comprising economic, political, social and cultural visions, and strategic in application, i.e. flexible and relying on the effective participation of various actors.

SPDMI focuses on the following points:

- Conceptualization of strategic planning
- The problems and potentials of Istanbul Metropolitan Area
- A road map including strategies, planning instruments, and priorities at various levels
- Institutional and legal considerations

The other strategic plan, the Earthquake Mitigation Plan for Istanbul (EMPI), is a comprehensive coordination of mitigation measures and risk management methods developed according to the causal structures and spatial distributions of

hazards and risks. It is composed of a contingency plan for the entire urban area, a local action plan in high-risk area and a bundle of research and activities programs to sustain the first two sets of actions.

EMPI evaluates the current legal structures, institutional responsibilities, disaster management, and financial schemes necessary for the implementation of the above two strategic plans. Then relevant model in each field is developed and recommendations are made. For example, after an assessment of the legal structure, a system with a long-term and short-term focus is recommended. For the long-term focus, it is recommended that disaster management should be in the hands of one ministry instead of current several ministries. For the short-term focus, it is recommended that the proposed disaster management model can be analyzed at the central, provincial and neighborhood levels.

EMPI stresses that risk management relates mostly to legal, social and political issues, and its realization requires support and commitment of governmental institutions at all levels as well as active participations of civil society ⁴. Besides Earthquake Safety, EMPI promotes:

- Improvements in Infrastructure
- Eradicating Unauthorized Constructions
- Protecting Historical and Cultural Values
- Facilitating Public Participation
- Enhancing Total Quality of Life and Urban Environment

CATEGORY/IES

This is a comprehensive sound practice that deals with different categories, it can be said that it tries to address all of them: legal, political, organization-

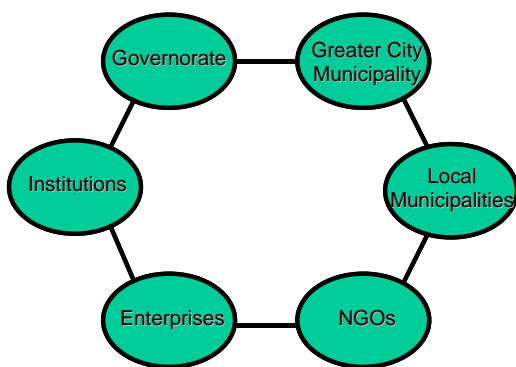
⁴ Zhang Lizhong, Earthquake Master Plan for Istanbul, an overview, <http://www-megacities.physik.uni-karlsruhe.de>

managerial, technical, land-use management and instructional.

SPONSOR/S

The Istanbul Metropolitan Municipality took the lead and signed MOCs and specific contracts with a consortium involving four leading universities which set up several working groups consisting of expert faculty members guiding an important number of young researchers and students.

KEY PLAYERS and their ROLES



Trough the development of EMPI and the whole participative process that it triggered, common agreement and stakeholder commitment was developed. The city would like to see it as a social contract among all the different organizations and persons that participated, with a clear understanding

of their roles in the new scheme, including clear mechanisms for accountability.

The Earthquake Master Plan study involved a multi-disciplinary team of more than 40 of the leading earth scientists, social scientists, engineers, urban planners, and other specialists from Turkey's four leading institutions of Bogazi University, Istanbul Technical University, Middle East Technical University and Yildiz University. The collaborative effort lasted more than a year. The investigators provided an in-depth assessment of the current situation, and identified and investigated several elements related to the Master Plan, including Seismic Risk Assessment, Urban Planning, Information Infrastructure, Education, Social Environment, and Disaster Management. The current earthquake risk factors and the aftermath of the 1999 earthquake are also well documented in the report. The Turkish version of the report exceeds 1300 pages. The study complements a scenario and vulnerability study recently completed for the city under funding from the Japanese International Cooperation Agency (JICA). The Master Plan study is a far reaching benchmarks study, which has never been accomplished to this extent in Turkey, and probably not in the world before. It is a major contribution to the effort of earthquake risk reduction in this city of more

than 10 million people.

TARGET GROUPS/RECIPIENTS

The whole society in Istanbul will be the direct beneficiary of the successful implementation of the earthquake master plan, since it addresses the reduction of current physical and social vulnerabilities in the city and it looks for improving the safety and living conditions of the community in general.

LOCATION/S

The strategic plans and action plans incorporated consider the whole greater Istanbul but also set priorities for specific districts depending on their level of vulnerability, availability of resources and cost effectiveness of the intervention.

As a test project some applications started in Zeytinburnu district of Istanbul city. We checked the buildings and identified the scores of buildings on earthquake. Some urban transformation projects are also developed

RESOURCES to (1) DEVELOP (2) to MAINTAIN

The availability of resources, both human and financial are key for the successful implementation of EMPI, the following issues need to be address as to count on enough resources to maintain this program over time:

- The popular and political support for the Master Plan will be facilitated through close cooperation with NGOs, the media, and the economic sector.
- Each project work package contains a particular risk management item that must be implemented. For purposes of ensuring implementation each project package must have a clearly identified stakeholder party, or a legally responsible partner. In turn this calls for suitable administrative restructuring and procedures.
- The process of ensuring resource creation and domestic or international financial support for the Contingency Plan and the Action Plan must be initiated without delay. A separate but parallel road map must be

elaborated immediately because new legal instruments should be formulated to overcome legislative or procedural obstacles, enforcement incapacity, and lack of standards or penalties if the Master Plan is to be realized.

- A wide range of technical research activities should be undertaken to support the project packages for the Contingency Plan and the Action Plan. These will gather information, create new databases or operate existing ones.

START and COMPLETION DATES

Initial steps were taken in year 2000, the design phase of the program was finished in year 2004, initial steps towards implementation have been taken around 20% on the implementation phase has been already undertaken by the municipality and its partners. It is expected a good flow of resources to complete this effort that will take several years to be completed.

Relevance to Megacities

This experience is one of the most relevant examples for other megacities around the world. It shows a whole process and how different stakeholders agreed on assisting the city in developing this strategic document. The implementation phase has already started and new challenges will be faced by the municipality, providing a new learning environment for others.

Knowledge Base Coding Reference:

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