Chapter 4

Case Studies in Africa, the Middle East, and Eastern Europe (Addis Ababa, Izmir, Skopje)

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Introduction

The three selected cities for Africa, the Middle East, and Eastern Europe are important and fast growing cities with very different development and characteristics.

Addis Ababa

Addis Ababa is the capital of Ethiopia. It was founded 110 years ago in central Ethiopia. The area of the greater metropolitan city is about 54,000 hectares, with a population of 2.9 million and an annual growth rate of 3.8 percent. More than 95 percent of the population live in single-story residential units with an average of two rooms. The city's development depends largely on manufacturing industries, followed by trade and services. The city is located on the western edge of the Ethiopian rift system. Several earthquakes have occurred along the rift and its vicinity and were felt in the city. Notable cases are:

- 1906 earthquake in Langano (epicenter 110 km from Addis Ababa) with an intensity of Mercalli scale 8 in the city, at a time when fewer than 50,000 people were living in Addis Ababa; and
- 1961 Kara Kore earthquake (epicenter 150 km from Addis Ababa), with an intensity of Mercalli scale 7 felt in Addis Ababa, which caused some damage in the city.

There is a high vulnerability of buildings since more than 80 percent are made with wood, mud, thatch, and reeds (Chika houses), and do not respect the building codes. Numerous, masonry, schools, hospitals, and bridges would not withstand even a medium-level earthquake. National earthquake resistant regulations exist since 1992, but these regulations are not enforced. Using the national disaster prevention and preparedness management plan, the Addis Ababa Foreign Relation and Development Cooperation Bureau serves as the focal institution. For coordination and establishment of contact points in each participating organization, nodal officers from all relevant government agencies of the city administration are assigned as contact persons to the focal institution (FRDCB).

Izmir

Izmir is a wealthy Turkish city (third in population and second in economic activities) on the west coast with important activities in industry, trade, tourism, health, education, and culture. Its population is about 3 million and has an annual growth rate of 3 percent, with considerable migration from eastern Turkey. It spreads over 90,000 hectares. The metropolitan municipality assembly of Izmir includes nine municipalities and deals with policies of transportation, city planning, land-use and metropolitan planning, road construction, water distribution, and waste water collection.

Throughout its history, the city has experienced several strong earthquakes, the latest in 1994. The ancient city, Smyrna was destroyed several times. On 10 July 1688, an earthquake killed 16,000 to 19,000 people. The earthquakes on 26 June 1880 and 31 March 1928 caused heavy damage in the city. As a result of the 1 February 1974 earthquake, 47 apartment buildings were damaged, two people died and seven were seriously wounded. The magnitude of the 1992 earthquake was Richter scale 6.0 with an epicenter of 50 km; there were about 100 buildings reportedly damaged.

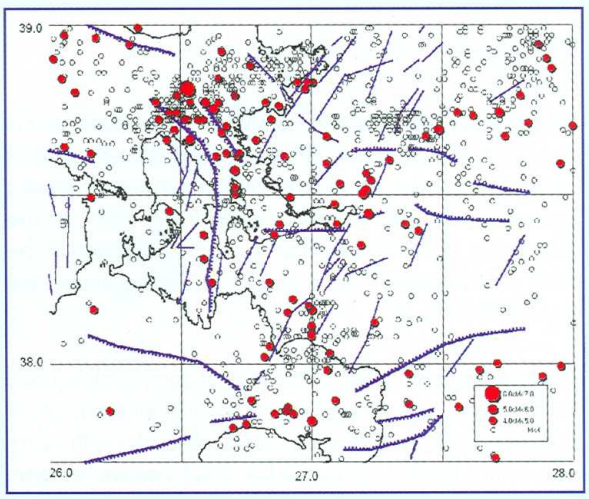

Figure 1: Historical seismic data for the Izmir region.

Turkey is a very centralized country. The governor's office is responsible for disaster management. The regional directorates of the Ministry of Public Works and Settlement and the Civil Defense Board work under the authority of the governor. They are also the members of the Natural Disaster Coordination Committee for each city. The mayor of Izmir and the engineering department, fire department, potable water, sewage systems, and food stocks of the Metropolitan municipality are the participants of this committee. Until the RADIUS project, the seismic risk management programmes carried out by the governor's office and the civil defense directorate were mainly bureaucratic activities. Implementation of the RADIUS project has facilitated cooperation among these central institutions and the municipal government. As was obvious during the recent management of the Izmir earthquake, coordination must be better organized for an efficient crisis management in the metropolitan area.

Another important factor in earthquake disaster mitigation and preparedness is enforcement of building codes that regulate the earthquake resistant design of buildings. A new code entered into force at the beginning of 1998 (the old code was from 1975). Construction permits are issued by the municipalities. The municipality of Izmir has signed a protocol with the Chamber of Civil Engineers and the Chamber of Architects to monitor engineering and architectural design, before the issuing building permits.

Skopje

Skopje is the capital of the Republic of Macedonia and is the country's major political, economic, and cultural center. The greater urban area of 7 municipalities covers approximately 180,000 hectares with one third of the population (550,000 inhabitants) and 45 percent of the GNP of Macedonia. The annual population growth rate is about 8 percent.

The city has been affected by several earthquakes since its creation, the most catastrophic being those of 518 AD, 1555, and more recently the Mercalli scale 6.1 earthquake Skopje, on 26 July 1963, considered one

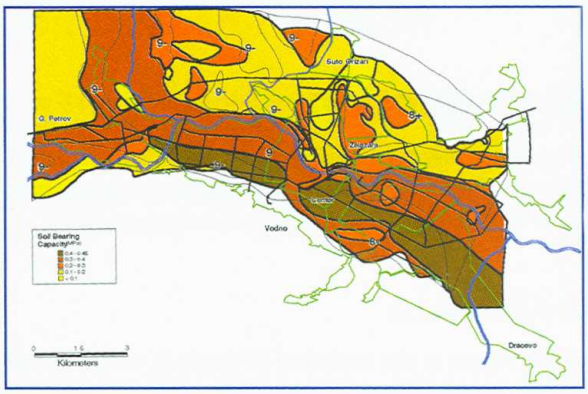

Figure 2: Seismic exposure of the transportation routes of Skopje.

of the most destructive earthquakes in modern Europe. The earthquake killed 1,070 people, seriously injured 3,300, destroyed 10 percent of the buildings, and 60 percent of the buildings suffered enough damage to justify reinforcement and repair. Of the total population 75 percent were left homeless. Information on that earthquake can be found in an appendix to the RADIUS project report for Skopje.

The first building code, Technical Regulations for Design and Construction of Buildings in Seismic Regions, was prepared in 1964 and was revised in 1981. It has been expanded with other codes and technical regulations for repair, reinforcement, and reconstruction.

After the 1963 earthquake, a seismic microzonation map of Skopje was prepared as the basis for the post-earthquake master plan enforced in 1969. Because of the former political system, all relevant activities are planned and centralized. Preparedness, emergency management and contingency planning are a legal obligation required by the law on protection against natural disasters.