

**Chapter 2:**  
**Geographic Database Development**

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## **Chapter 2. Geographic Database Development**

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Since the commencement of the Study, many types of physical, environmental and socio-economic data in the Study area have been collected.

These data were analysed and evaluated as basic information for this Study. In order to analyse the existing conditions of the Study area, the Study Team has developed a GIS database. Based on the output of the GIS database, existing conditions of the study area are explained. Whole procedures of GIS development are shown in Figure 2.1.1.

### **2.1. Procedures of the Study**

#### **2.1.1. Data Analysis Unit**

In urban/regional planning, the data analysis unit usually employed is that of administratively delineated city sub-districts, or some smaller unit. In Tehran, however, despite the effort to locate data for these administrative units, the Study Team found only concrete and detailed maps for Tehran's 22 district boundaries. According to the Statistics Center of Iran (SCI), a census survey is conducted once every 10 years and a supplemental survey once every 5 years. In Tehran, a total of 34,805 census blocks are identified and these blocks are aggregated into 3,173 census zones (Figure 2.1.2). Statistical data on population and buildings were accumulated based on these census units. These data were provided to the Study Team in DBF file format by SCI. The census zone boundary was drawn on the traditional Mylar base map (scale 1:2,000), which consisted of 422 sheets. In this Study, the census zone boundary is used as the base unit for the spatial data analysis.

#### **2.1.2. Data Analysis**

Based on the geographic database, spatial characteristics of natural and social conditions of the study area were analysed. The data analysis process consists of three stages: the primary, secondary and tertiary. During the primary data analysis stage, a simple overlay analysis was conducted to show the existing conditions of the study area. For instance, the census zone, district boundary and related population data were combined and displayed together as a population map.

During the secondary data analysis stage, primarily processed data items were combined and superimposed on each other. Seismic disaster potential of the study area was analysed and mapped.

During the tertiary data analysis stage, detailed seismic damages were assessed based on the analysis results of previous stages. All outputs generated by this data processing were mapped and related tables were compiled.

Existing natural and social conditions of the study area, based on the primary data analysis, are described in the Chapter 2, section 2.2. Results of the secondary and the tertiary data analysis were described in Chapter 4.

#### **2.1.3. Comprehensive Evaluation of Vulnerability**

Overall seismic disaster vulnerability of the study area was evaluated by the physical and social indicators. District-wise seismic vulnerability was examined and mapped in radar chart format.

#### **2.1.4. Execution of Pilot Study**

A pilot study was conducted to learn, in detail, the level of seismic disaster preparedness in the urban community. A property-based building survey was conducted, and a detailed database was developed. A diagnosis of seismic disaster preparedness in the pilot study area was compiled, and issues for seismic disaster mitigation were stated.

#### **2.1.5. Recommendations for Seismic Disaster Mitigation**

Recommendations for seismic disaster mitigation were described from institutional, urban planning and architectural point of view.

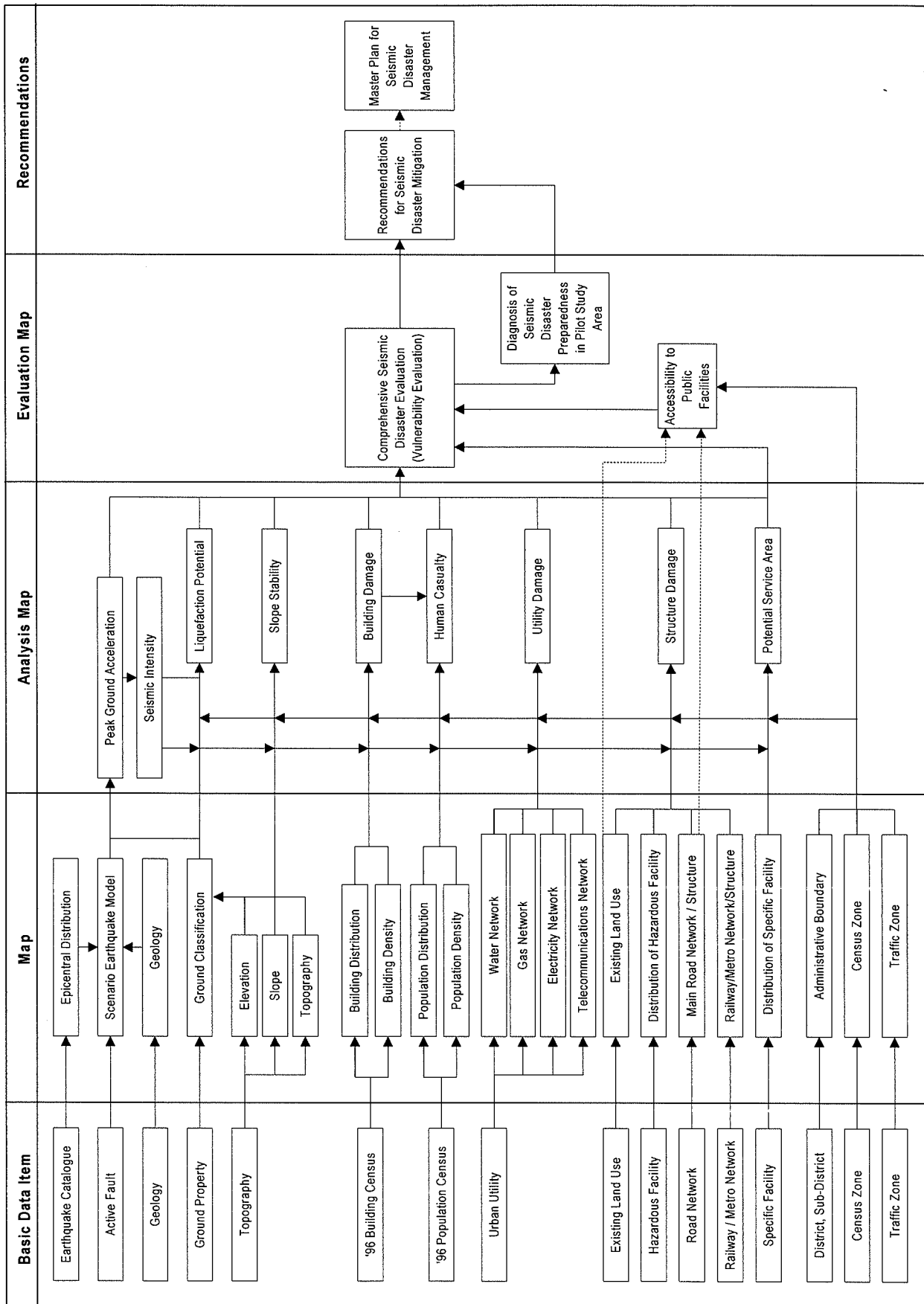
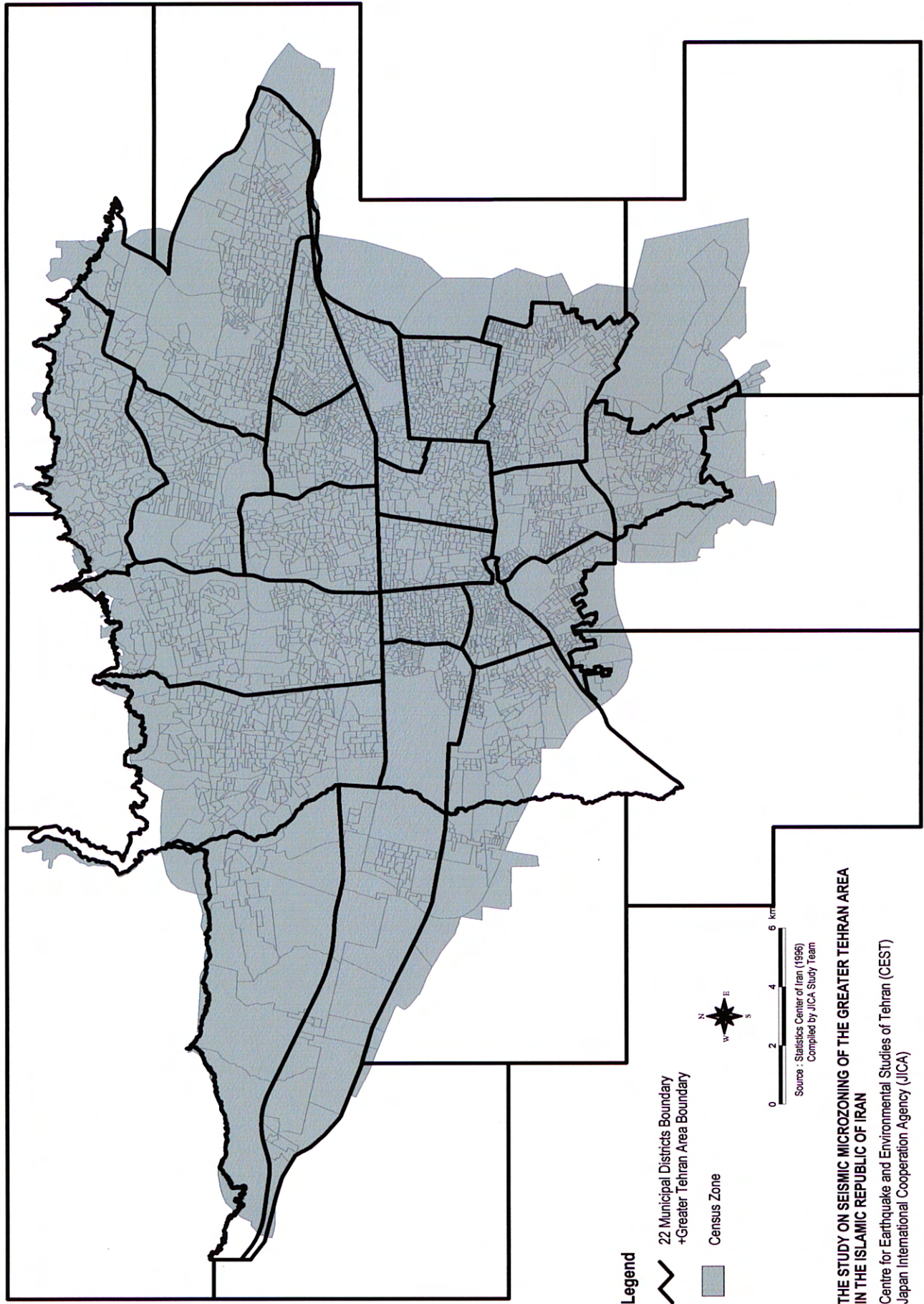


Figure 2.1.1 Procedures of GIS Development

Figure 2.1.2

### Census Zone



## **2.2. Existing Natural and Social Conditions in the Study Area**

### **2.2.1. Topography**

The Study Area is located at the foot of the southern slopes of the Alborz Mountain Range. The area can be simply classified into 5 topographic: (1) mountains, (2) hills, (3) old alluvial fans, (4) young alluvial fans and (5) alluvial plains. The distribution of each topographic unit is shown on Figure 2.2.1.

### **2.2.2. Geology**

The geological map, which focuses on Cenozoic sediments in the Tehran region, was prepared for this Study by the Geological Survey of Iran (GSI). This geological map basically presents the distribution of the Pliocene and Quaternary alluvial and glacial deposits in the Tehran plain between 51°00'-51°44'E and 35°28'-35°22'N. The classification of alluvial deposits according to Rieben (1996) is used as the basis for mapping different lithologic units of the Study Area. The geological map of the Study Area is shown on Figure 2.2.2 and a general section of alluvial deposits of the Tehran region is shown on the Figure 2.2.3.

Figure 2.2.1

# Topography

