

Chapter 1:
Introduction

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In response to the request by the Government of the Islamic Republic of Iran, the Government of Japan conducted “ The Study on Seismic Microzoning of the Greater Tehran Area” (hereinafter referred to as “ the Study”) in the Islamic Republic of Iran. The Japan International Cooperation Agency (hereinafter referred to as “ JICA”), the official agency responsible for the implementation of technical cooperation programs of the Government of Japan, dispatched a Study Team to Tehran on April 12, 1999 to conduct the Study in accordance with relevant Japanese laws and regulations. The Study was also undertaken in accordance with a Scope of Work agreed upon by the Centre for Earthquake and Environmental Studies of Tehran (hereinafter referred to as “ CEST”) and JICA.

CEST acted as the Counterpart Agency, representing the Government of Iran in coordination with other related governmental agencies and organisations. The duration of the Study, up to the official submission of the Final Report in December 2000, was approximately 18 months.

1.1. Background of the Study

The Greater Tehran Area is located at the foot slope area of the Alborz Mountains, which form part of the Alps-Himalayan Orogenic Zone. This zone is one of high seismic potential with many peculiar active faults. The urban area of Tehran has been developed on alluvial layers, accumulated on hard rock through complex geological formations. According to historical seismic data, Tehran has suffered from several strong earthquakes with return periods of 150 years. The city of Manjil, located 200 km west of Tehran, suffered from a strong earthquake in 1990, which killed approximately 14,000 people. Seismologists believe a strong earthquake will strike Tehran in the near future because the city has not experienced a disastrous earthquake since 1830.

Urban development has been rapidly progressing in Tehran without the development of proper disaster prevention systems against potential earthquakes. It is urgently necessary to prepare a regional/urban earthquake disaster prevention plan in order to mitigate possible seismic damages in Tehran.

1.1.1. Study Objectives

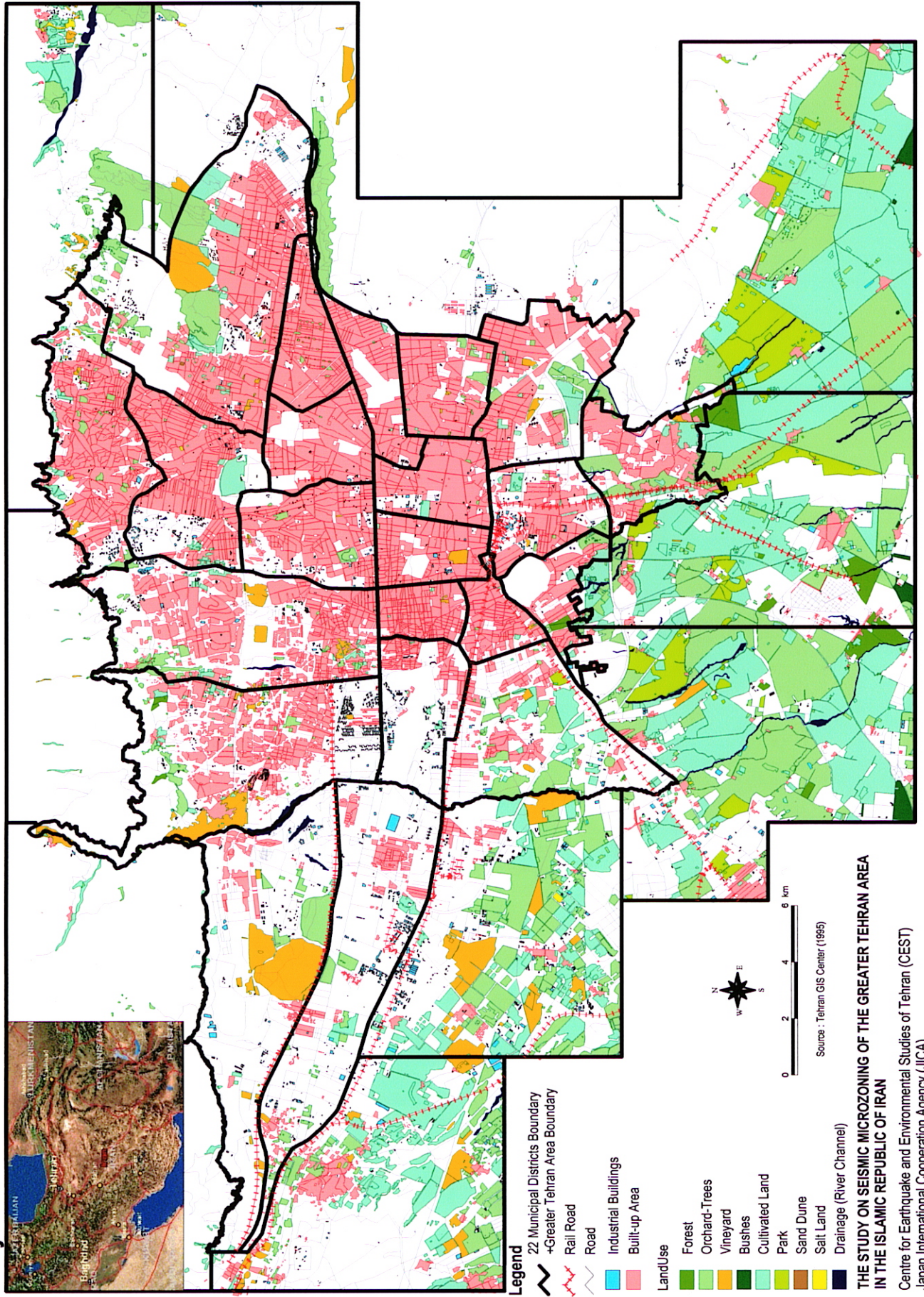
The objectives of the Study are 1) to compile seismic microzoning maps which can serve as a basis for the preparation of a regional and urban seismic disaster prevention plan of the Greater Tehran Area and 2) to make recommendations for the mitigation of seismic disaster.

1.1.2. Study Area

The Study Area covers the Greater Tehran Area, including the Tehran Metropolitan Area, which consists of 22 districts. (See Figure 1.1.1)

Figure 1.1.1

Study Area



1.2. Basic Approach and Methodology of the Study

The seismic microzoning was carried out based on the following approach and methodology:

- 1) The seismic microzoning was conducted using Japanese state-of-the-art technology. Specifically, the analytical methods applied in this Study were based on Japanese urban disaster experience.
- 2) While it was important to apply global knowledge, theories and previous experience to the Study, more emphasis was placed on existing Iranian knowledge and experiences. Detailed seismic studies have been conducted by Iranian researchers and engineers, and these results were incorporated in the Study. Furthermore, basic data for the seismic microzoning were collected from various local research organisations, universities and public institutes.
- 3) Cooperation between the Study Team and local Iranian counterparts was very important in obtaining effective output. Mutual understanding was developed through seminars, meetings and discussions. For example, the objectives of field investigations to be conducted by the Study Team were developed and finalised based on discussions with related organisations, universities and public institutes.
- 4) The results of the microzoning shall be utilised for future urban development planning and urban disaster prevention planning in Tehran. The following matters were taken into consideration:
 - Adoption of clear, practical, state-of-the-art methods;
 - Unified and integrated analysis methodology;
 - Utilisation of existing GIS data files; and
 - Harmonisation with existing plans and programs.
- 5) Knowledge of earthquake engineering in Iran is extensive. Therefore, technical transfer focused on the following three items:
 - Introduction of Japanese knowledge and experiences;
 - Techniques for the practical execution of microzoning; and
 - Methods to interpret microzoning results.

1.2.1. Tasks of the Study

In order to achieve the objectives of the Study, the following tasks were carried out:

Step 1: Existing data collection, analysis and evaluation to identify the study issues;

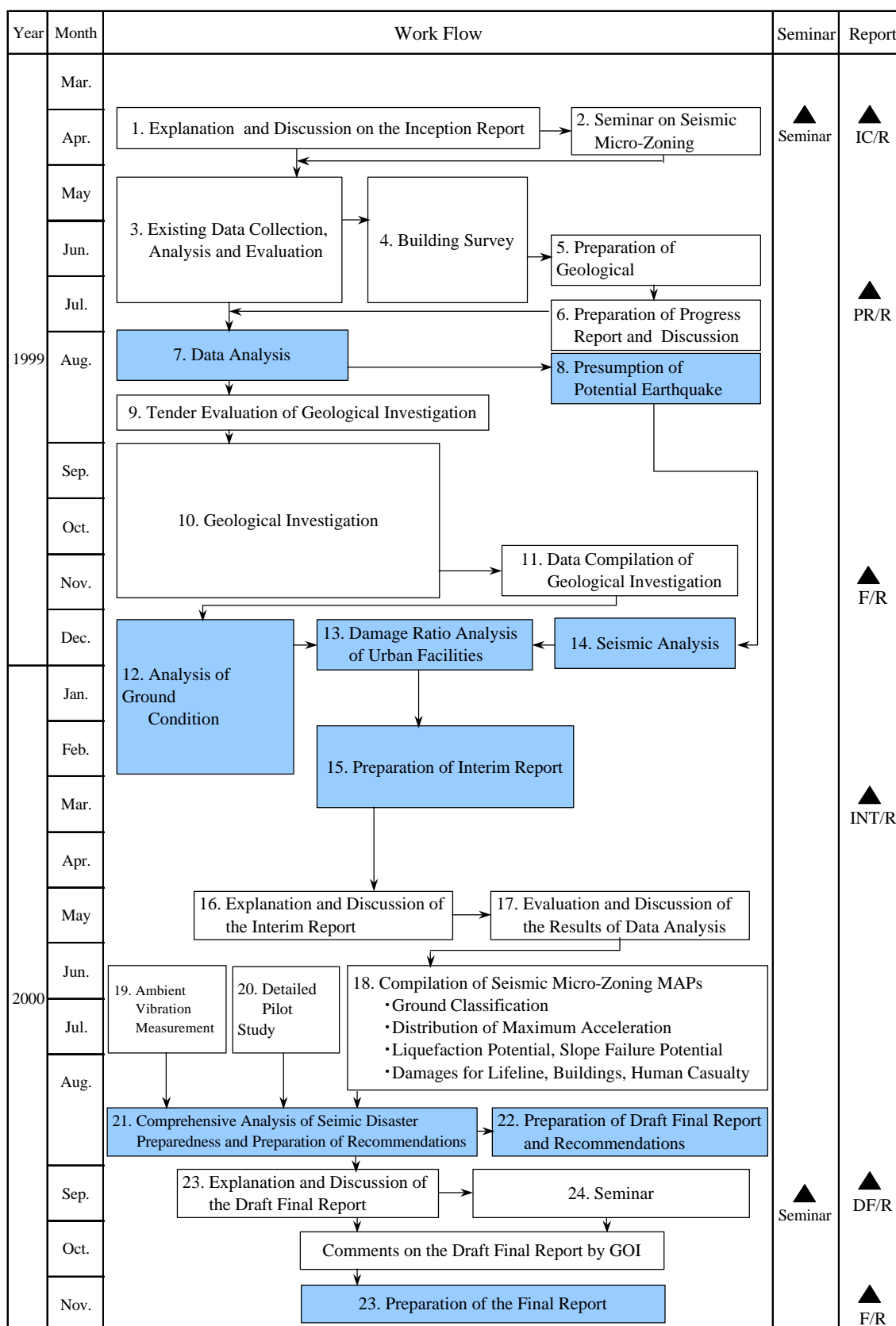
Step 2: Geological Investigation;

Step 3: Analysis of ground conditions and seismicity;

Step 4: Seismic damage analysis and compilation of seismic microzoning maps; and

Step 5: Overall evaluation and preparation of recommendations

The general workflow of the Study is shown in Figure 1.2.1 and a step-by-step workflow of the Study is shown in Figure 1.2.2.



Work in Japan

Figure 1.2.1 General workflow of the Study

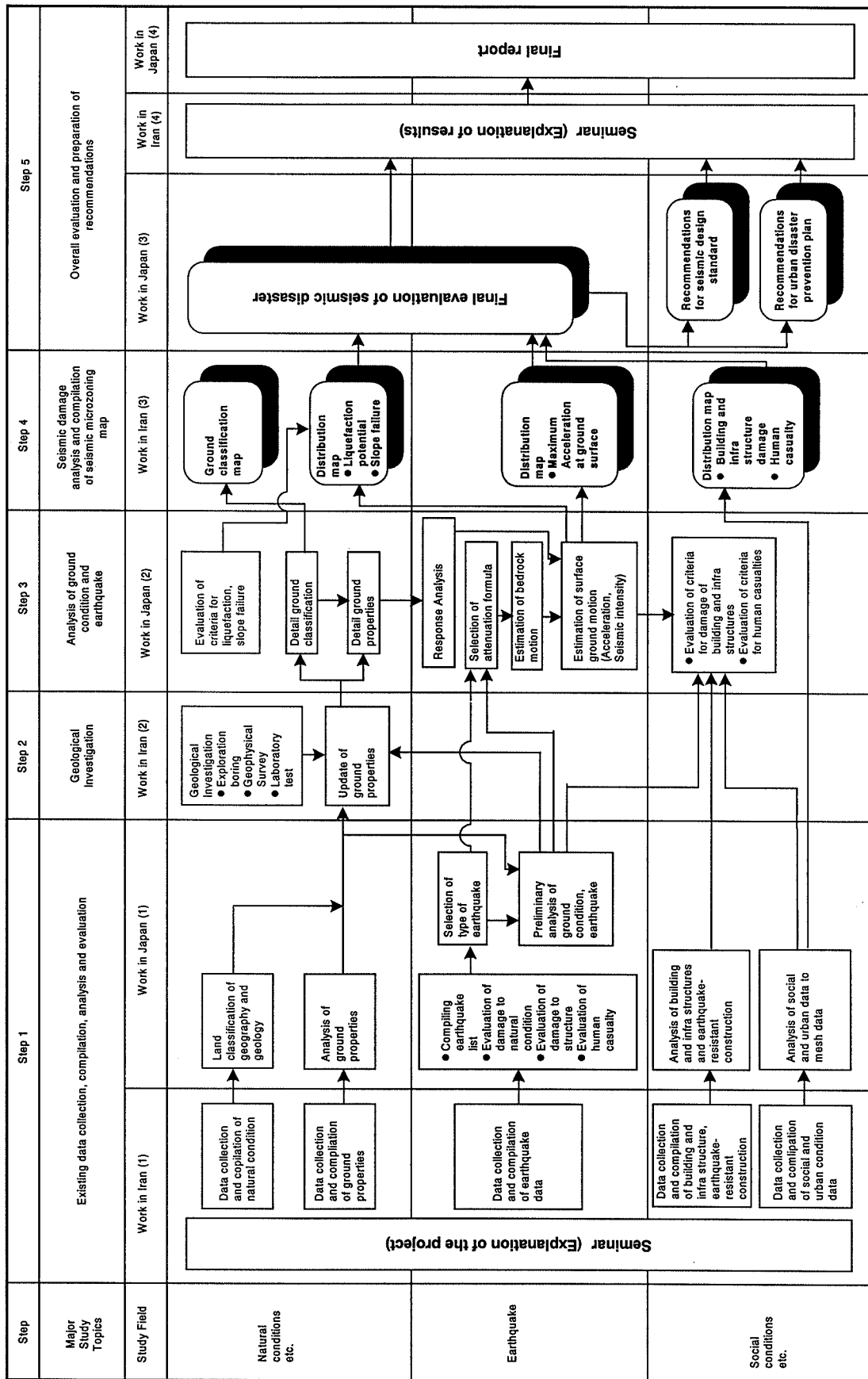


Figure 1.1.3 Step-By-Step Workflow Of The Study

1.3. Study Organisation

Figure 1.3.1 shows implementing study organisation of the study. A list of study member can be found in first part of this report.

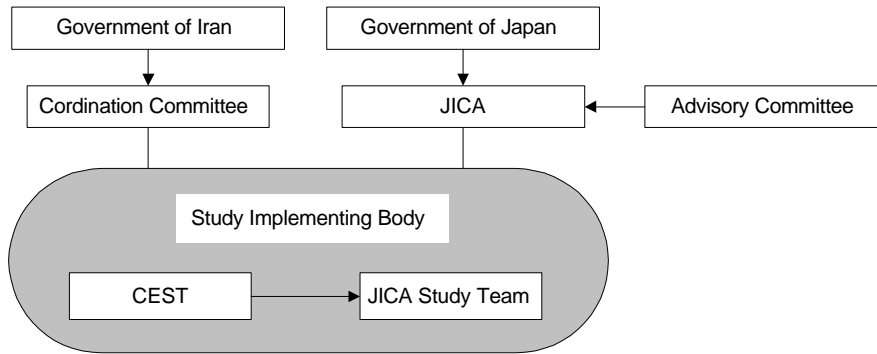


Figure 1.3.1 Study Organisation