

302/1878711

NAME OF CANDIDATE: AMIR MAHMOUDZADEH  
NAME OF SUPERVISOR: PROF. MEHTAB ALAM  
NAME OF CO-SUPERVISOR: DR. SAIED PIRASTEH

DEPARTMENT OF CIVIL ENGINEERING  
FACULTY OF ENGINEERING AND TECHNOLOGY  
JAMIA MILLIA ISLAMIA  
NEW DELHI

**STUDY OF EARTHQUAKE DISASTER AND ITS CRISIS MANAGEMENT OPERATION  
IN ESFAHAN, CENTRAL IRAN, USING REMOTE SENSING AND GIS APPLICATIONS**

**Abstract**

Iran is one of the susceptible country to seismicity in Asia the major cities include Tehran (Capital city), Esfahan, the study zone, Shiraz, Mashhad, Tabriz and Kerman. Iran is exposed to many minor and major earthquakes annually. Here, the objective is to provide a crisis management master plan for the mega city of Esfahan based on the diagnosis of the geographical status of Esfahan province as the city of Esfahan has the potential of becoming the future capital city of Iran. At the moment Isfahan is the second mega city of Iran, with its great industrial zones. It is one of the internationally renowned historical cities, divided into northern old (a section of the old part) and southern new parts by the Zayandeh-Rood River. All of these unique features establish the grounds for us to introduce a new inter-disciplinary technique with respect to the diagrams and trends in order to combine Civil Engineering and Industrial Engineering to obtain a major strategic master plan for crises management. The main idea is driven from FMEA<sup>1</sup>. It is worth mentioning that FMEA is one of the tools in TQM<sup>2</sup> method in quality management and one of the most important methods in fault detection and elimination of the failures.

---

1 - Failure Mode and Effect Analysis

This thesis involves the application of RS<sup>3</sup> and GIS<sup>4</sup> techniques and field studies based on FMEA approaches for establishing a scientific procedure in estimating the vulnerability of the given structure based on which the subject will be prioritized for decision making.

At the present time there are numerous weak buildings which are not able to withstand earthquake. By utilizing remotely sensed data we can produce thematic GIS maps. This procedure has been applied in this study. Private and public developers are trying to use the scientific methods to prioritize and allocate budget in order to reinforce the above mentioned structures; this is because of limited financial resources and time. In the recent years this procedure has been applied in many countries. It seems logical to renew our structures now as we are equipped with sufficient data about the effects caused by earthquakes.

In the present work different standard methods against the developed method have been compared. The proposed method satisfies the standard methods. This research shows that the combination of Remote Sensing and GIS Technology with Civil Engineering and Industrial Engineering have long extensive areas to cover in the future in order to develop better innovative methods. It has been found that using interdisciplinary technique could be more helpful in protecting life and property of the population against any hazard. However, this study reveals that Geo-information technology beside Civil Engineering and Industrial Engineering are applicable for better mitigation and management of the crisis caused by earthquakes. The developed method in this research has also satisfied the role of Geo-information technology in crisis management to mitigate the disastrous situation.

---

2 - Total Quality Management  
3 - Remote Sensing  
4 - Geographical Information System