



Prevention and Mitigation for Seismic Disaster

Yasuyuki HIROSE

Associate Professor, Ms. Eng. (Civil Engineering)

Email : hirose@gifu-nct.ac.jp

Research Fields City Planning, Earthquake Engineering

Keywords Disaster Prevention, Disaster Mitigation, Aseismic Engineering

● Research Outline

Measures of Prevention and Mitigation for Seismic Disaster

Within 30 years, the probability to suit a fire is 1.9%, and the probability of a traffic fatal accident is 0.2%. As comparison of figure-1, we can understand that it is by no means low also as 3% of a probability of occurrence of an earthquake, for example. Moreover, even if the probability of occurrence of an earthquake is not high, the damage will become serious once an earthquake occurs. And much labors and time are needed for restoration or revival.

The seismic disasters cause serious damage to infrastructures especially also in the natural disasters. For the countermeasure of prevention and mitigation for a disaster in the future, the measure of regional restoration under those hazard is considered carefully.

Surveillance study is carried out about the earthquake as follows:

- The Southern Hyogo prefecture earthquake in 1995
- Mid Niigata Prefecture Earthquake in 2004
- Noto Hanto Earthquake in 2007
- The Niigataken Chuetsu-oki Earthquake in 2007
- The 2011 off the Pacific coast of Tohoku Earthquake

In addition, damage evaluation of earthquake disasters is considered from the analysis and an experiment of earthquake-proof and a vibration control model as dynamic approach.

In the stricken area, we are active for investigation, restoration and reconstruction assistance in cooperation with inhabitants, NPO, administration, etc. as a social system.

In the Southern Hyogo prefecture Earthquake and Tohoku Earthquake, lots of evacuee people grew. However, the refuge that the municipality had specified was not able to accommodate all evacuees. And a lot of evacuees to live in the park and the plaza grew.

Recognizing this fact, the hearing to examine are carried out whether the refuge is enough secured from the evacuee by large scaled earthquake, in Gifu City.

As a result, it is cleared that the municipality is not setting up the refuge in consideration of the population and the number of evacuees. It is said that the municipality should forecast the number of evacuees and they should examine the installation of the refuge based on it, because the failure of these earthquake is never repeated. Then, it is proposed that examination technique of the best in refuge arrangement and technique of optimization of number of users. So these technique are tried and evaluated as case study about center zone in Gifu city.

Development of Disaster Information System

When a disaster occurs, it is necessary to take corresponding for residents evacuation and recovery infrastructures. So it is important to carry out as soon as possible to collect, judge and outgoing the disaster information, including the damage situation.

To solve this problem, disaster prevention information system using web has been developed. Points to be considered are as follows. Widely residents can be registered disaster prevention information. Departments of government is sorting the information. Visible to people in need of information.



Fig-1. Screen of the iOS application Disaster prevention information system developed in collaboration with Gifu Prefecture