

## **ABSTRACT**

Japan is a country with high road density and many natural disasters such as earthquakes and typhoons. Hence, risk management of the road networks is a very important issue. Currently, Japan's decision making system is changing from centralize to decentralize. In the situation, from the risk management viewpoint, it is important to quantify the optimum management system of the road networks to clarify the roles of each local government. When natural disasters occur on a road network, the economic damages are distributed to a wide range of areas depending on the road's characteristics. The optimum maintenance costs of each road network should be analyzed with these characteristics in consideration.

Therefore, the Spatial Computable General Equilibrium model "RAEM-Light" is applied in order to calculate the economic damage distribution of each road network. This information is then depicted using geographical information systems. The RAEM-Light model has some innovative features. For example, the spatial behaviors of producers and consumers are explicitly described and are endogenously determined by using production and consumption functions. This model also applies a slightly different concept than the traditional Spatial Computable General Equilibrium model in that it does not depend on the input-output data. It is therefore well suited for analyzing detailed areas where official input-output data is not available. In this paper, several disaster scenarios are analyzed by the RAEM-light model. The results of these scenarios quantify the economic damage distribution of the road networks based on their characteristics. Based on this information, the optimum maintenance policy of road network can be determined.