

Evaluation of volcanic disaster risk: the cooperation between lava flow simulator and building database

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Volcanic disaster is caused by the various volcanic phenomena, affecting some damages around neighbors. For the evaluation of volcanic disaster, the eruption event tree

(Newhall and Hoblitt, 2002) is widely applied and we judge the forthcoming phenomena from several possibilities at the event tree nodes. Each node of the event tree is defined as: node 1: unrest, 2: origin, 3: outcome, 4: magnitude, 5: phenomena, 6: sectors, 7: distance, 8: exposure and 9: vulnerability. For nodes 1 ? 7, the evaluation is based on volcanology, but for nodes 8 and 9, social factors are incorporated. For the area in risk of the volcanic disasters, we made a time- and space dependent model of population, real estates, transportation infrastructures, and production bases, and evaluate its temporal evolution. Our volcanic disaster risk management system applied the RDBMS (Relational DataBase Management System). LavaSIM, lava flow simulator is used for volcanic hazard evaluation. In addition, for the evaluation of exposures and vulnerabilities, we used the data developed by CSIS, the University of Tokyo. The new system enables quick evaluation of volcanic disaster by comparing lava flow and building data by use of the comparison in RDBMS, and expresses the results in GIS. In near future, people flow data is also incorporated into system as the data of exposures and vulnerabilities.

Keywords: volcanic disaster, risk evaluation, lava flow simulation, building database, exposure, vulnerability