

First-order estimates of economic losses from ash fall for some Asian mega cities

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First approximation economic losses can be estimated by combining information about the probability of a hazard occurring, an inventory of exposed assets (and their values), and a series of functions indicating the vulnerabilities of the assets to the impact of the hazard. We use this approach to examine potential losses from ash fall in five Asian mega cities - Jakarta, Manila, Taipei, Tokyo, and Seoul.

Ash fall magnitude and frequency for the five mega cities were estimated by Jenkins et al. (2012) after utilising the ASHFALL tephra dispersal model to simulate 1000 scenario eruptions for each volcano threatening each of the five cities. Results are expressed as exceedance probabilities of ashfall thickness per square kilometre of city.

Exposure is estimated by dividing the areas of each city into broad land use types - commercial, industrial, residential, roadway, open space, airport etc. Per unit values are assigned to each land use type.

Vulnerability functions for a range of ashfall thicknesses relevant to each land use type have been developed. These functions also take into account the costs of ashfall cleanup and removal.

The methodology allows ranking of the cities in terms of ashfall risk and can be extended readily to other cities, to other assets, and to other natural perils.