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Loss Assessment of Agricultural Crops Subjected to Volcanic Ash Fall Hazards

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Abstract: In this study, a methodology is presented to assess the production loss of agricultural crops in South Korea based on the volcanic ash fragility and the scenario of volcanic ash deposition. In order to assess volcanic ash fragility, agricultural crops are classified as ones in outdoor and greenhouse farming. The volcanic ash fragility of crops in outdoor farming is assessed by using damage data based on the 2006 eruption of Merapi volcano in Indonesia. The volcanic ash fragility of crops in greenhouse farming is developed by using the FOSM (first-order second-moment) method based on reliability indices of vinyl greenhouses. Scenarios of volcanic ash deposition are obtained by using the volcanic ash dispersion data simulated by the FALL3D and WRF models. In this presentation, production losses of representative crops in Chungcheongnam province are shown as examples. The volcanic ash fragility and the loss estimation algorithms developed in this study will be used to evaluate damage prediction and mitigation for volcanic eruptions influencing South Korea.

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