Modeling of Information Flow for Early Warning in Mount Merapi Area, Indonesia

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Indonesia's Mount Merapi is one of the world's most active, dangerous volcanoes. Its 2010 eruption -- the largest following the 20th century -- and succeeding 2011 lahar events killed 389 persons and injured and displaced many more. One way to mitigate a disaster's impact on its potential victims is to provide the public with reliable information through early warning. Warning information must reach down to the community levels. However, little research has been done on the contents of warning information flowing from the monitoring and forecasting institutions to the public. For Merapi's early warning, the routes of information from monitoring and forecasting agencies down to the citizens was studied by Rahardjo in 2007, yet the contents of information itself was not understood. This study reinvestigated Merapi's early warning information flow down to the citizens by conducting interviews among stakeholders to collect the data received and from which stakeholder, data sent and to which stakeholder, and the method of delivery. The sender-data-receiver as the basic unit of information transfer was introduced for the construction of information flow networks. In terms of information flow networks, it was necessary to construct individual networks for eruption and lahar per local government district due to the complexity of structures. Among the districts, inconsistencies in relation to past and current network structures for both disasters and in each district, roles of institutions, decision-making for issuance of evacuation order, and monitoring sources were found. Information transfer redundancies and vulnerabilities such as bottlenecks and decision-making issues were also revealed. These issues could offer a new point of view on early warning information delivery for Merapi's disasters.

Keywords: information, early warning, Merapi, eruption, lahar

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