Bamboo Forest as a Natural Levee of Pyroclastic Flows in Merapi Volcano

Suryaningsih, Azizah Dewi

In 2010, the pyroclastic flows from Merapi vocano (Indonesia), deviated from the track and caused a big damage and big diverification in its morphology. Related to volcanic eruption, a local belief inform that bamboo forest can be used as a natural warning system. The sound produced when bamboo clumps was burned by pyroclastic flows could be used as an alarm. This research aims to design a mitigation system from bamboo forest as a natural levee in Merapi eruption based on the local belief and considered the side benefits of bamboo. Four methods were used in this research; interview, literature review, mapping-observations and modelling with simulations software. The researcher did interview to find out local belief, reviewed research papers which the data were analyzed by modelling to calculate the drag forces, pressure, and distance among the bamboo forest. This study found people around Merapi believe that bamboo forest where dominated by Bambu Petung (Dendrocalamus asper) could survive after pyroclastic flows hacked and it has a good benefit for the environment. The bamboo could growth and spread naturally after the eruption. In order to optimize the natural levee of pyroclastic flows system, the distance of the bamboo clumps should be in 6x10 meters, which could reduce the probability of damages in the area until 40-50%. Then, based on the normal distribution, the percentage of damage area in 41-100% had 55.78% probabilities to happen. This study found that content in soil and water is good enough to plant the bamboo forest. The focus for the next development research are land reclamation and application on the area. Keywords: local belief, bamboo clumps, bamboo forest, land reclamation, mitigation system, pyroclastic flows

Awards Won:

Geological Society of America &amp

American Geosciences Institute: Third Award of $500