Landslide Hazard Analysis and Mitigation for Sepanjang Village, Central Java Indonesia

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Abstract

This study is based on 8 weeks of field work and study in Indonesia during summer 2013 participating in a student-based community service program run by Gadjah Mada University. The study was focused on the village of Sepanjang in Central Java which is located on the southwestern flank of Mount Lau, a dormant stratovolcano. The project was a landslide mitigation effort focused on the improvement of landslide education for the village by creating an up to date field map that provided the village with locations and descriptions of landslides, potentially dangerous areas, evacuation routes, and general meeting areas during emergencies.

Indonesia is a massive archipelago that contains 18,000 islands and is located on the southern lobe of the Eurasian plate. Subduction of the Australian plate underneath the Eurasian plate bounds Indonesia to the west and south, and subduction of the Pacific plate underneath the Eurasian plate takes place to the east. These tectonically active zones are characterized by intense volcanism and seismicity that have a continuous effect on the topography. Annual rainfall for Java is 69.1 inches per year, which is almost seven times that of San Diego, CA. These factors contribute heavily to the susceptibility of landslides and result in the imminent danger to people and infrastructure. These susceptibilities were produced by measuring the physical properties of the landslides, including slope, thickness of soil, amount of vegetation, land use, and existing signs of recent movement. Assistance from other Gadjah Mada students allowed for both dispersal of the susceptibility map to local leaders and rescue teams, as well as providing villagers with landslide education and ways to notice and respond to signs of land movement.

Active landsliding is widespread in the area of the village and presents hazards to people and property. The impact of human development on the landscape plays a significant role in producing landslide hazards in the area that include road construction, agricultural terracing, and quarrying for building materials. This study brought to light the lack of landslide understanding in rural Java and the need for educational services to help local villagers see, prepare for, mitigate, and respond to landslide disasters.