Geophysical Research Abstracts
Vol. 19, EGU2017-13269, 2017
EGU General Assembly 2017

Analysis of rainfall characteristics and its related disasters of slag disposal pit of a certain Gold-Copper Deposit in Fujian province

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According to the geological investigation in Fujian province, the total number of geological disasters was 9513, in which the number of landslide, collapse, unstable slope and surface collapse was 5816, 1888, 1591, 103 and 115 respectively. The main geological disaster was the landslide with 61.1% of total geological disasters. Among all these geological disasters, only 6.0% was relative stable, 17.0% was basic stable, nearly 76.0% was unstable. The slope disaster was the main geological disaster, if the unstable slope was the potential landslide or collapse; the slope collapse was 98.0% of all geological disasters. The rainfall, in particular the heavy rain, was direct dynamic factor for geological disasters, but the occurrence probability of geological disasters was different because of the sensitivity of the geological environment though of the same intensity rainfall.

To obtain the characteristics of soil erosion under the rainfall condition, the rainfall characteristics and its related disasters of slag disposal pit of a certain Gold-Copper Deposit in Fujian province was analyzed by the meteorological and rainfall data. According to the distribution of monitoring stations of hydrological and rainfall in Longyan city of Fujian province and the location of gold-copper deposit, the Shanghang monitoring station of hydrological and rainfall was chosen, which is the nearest one to the gold-copper deposit. Then main parameters of the prediction model, the antecedent precipitation, the rainfall on the day and the rainfall threshold, were calculated by using the rainfall data from 2002 to 2010. And the relationship between geological disasters and the rainfall characteristics were analyzed.

The results indicated that there was high risk for the debris flow with landslide collapse when either the daily rainfall was more than 100.0 mm, or the total rainfall was more than 136.0mm in the gold-copper deposit and the Shanghang region. At the same time, although there was few risk for the debris flow when the daily rainfall was between 50.0-100.0mm, once the soil was saturated or nearly saturated because of the continuous antecedent precipitation, debris flow disaster would occur even the daily rainfall was only 50.0mm. In addition, it was prone to trigger debris flow disaster when the daily heavy rainfall was more than 100.0mm or the torrential rainfall in 3 days was between 250.0 -300.0mm.