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Revisited Rainfall Threshold In the Indonesia Landslide Early Warning System

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Landslides are one of the most disastrous natural hazards that frequently occur in Indonesia. Since 2017, Balai Sabo has developed an Indonesia Landslide Early Warning System (ILEWS) by utilizing a single rainfall threshold for an entire nation. This condition might lead to inaccuracy of the landslide prediction. Therefore, this study aims to improve the accuracy of the system by updating the rainfall threshold. This study focused on Java Island, where most of the landslides in Indonesia occur. We analyzed 420 landslide events with the one-day and three-day cumulative rainfall for each landslide event. Rainfall data were obtained from the Global Precipitation Measurement (GPM), which is also used in the ILEWS. We propose four methods to derive the thresholds, 1st is the existing threshold applied in the Balai Sabo-ILEWS, the 2nd and the 3rd use the average and minimum of rainfall that trigger landslides, respectively, and the 4th uses the minimum values of rainfall that induce major landslides. We employed the Receiver Operating Characteristic (ROC) analysis to evaluate the predictability of the rainfall thresholds. The 4th method shows the best result compared to the others, and this method provides a good prediction of landslide events with a low error value. The chosen threshold will be used as a new threshold in the Balai Sabo-ILEWS.