Exploration of the characteristics of landslide triggering rainfall using rain gauge and numerical weather prediction for Yogyakarta and Central Java, Indonesia

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**MOTIVATION**

- The existing system for landslide early warning uses national rainfall thresholds, based on median of 1-day and 3-days accumulated rainfall.
- Use rainfall data derived from satellite products and rainfall forecast data with a spatial resolution of 0.25° x 0.25°, which is not adequate for catchment-scale landslide analysis.
- To define novel regional thresholds, based on hourly rainfall.
- Various thresholds represent the levels of exceedance probability.
- Exploration of the usage of the high-resolution numerical weather prediction (NWP) output in simulating the rainfall inducing the landslides for several historical landslide events.

**DATA AND METHODS**

- Landslide events inventory: Updated and collected landslide events, added the estimated time of the events from authorized and unauthorized sources. + the antecedent rainfall triggering the landslides (currently, only 2017-2019 events were analyzed)
- Construct rainfall thresholds using the relation of accumulated rainfall and duration (ED), equivalent to mean intensity and duration (ID).
- Frequentist method (Brunetti et al., 2010)

**RESULTS**

- Construct rainfall thresholds using the relation of accumulated rainfall and duration (ED), equivalent to mean intensity and duration (ID).
- Performance of the rainfall simulated by NWP (with 0.1°x0.1° of spatial resolution). Each date (dd/mm) near the points shows the start date of the simulation.
- For the two cases, the actual landslide events (x) are within the range of simulation members.

**CONCLUDING REMARKS**

- We demonstrated our attempt in improving the landslide early warning with a regional thresholds approach and in exploring the potential application of high-resolution NWP output in reproducing the rainfall triggering landslides.
- This is a preliminary exploration study, the inventory will be extended.