The regional study area, Antioquia, is located in the central Colombia Andes, with an extension of 63,612 km², where 3,039 catchments were analysed. A detailed hazard analysis was carried out on prioritized areas.

The regional analysis assessed debris-flow processes hazard by combining susceptibility, slope stability, and soil type at the catchment scale. The results were used to select critical catchments for a more detailed scale, where hazard was assessed through hydraulic software (IBER), along with a fluid-dynamic mass routing model (r.avaflow).

Regional analysis show most catchments in mountainous terrains exhibit torrential behavior and allowed to localize the most critical zones. In the detailed analysis, hazard was calculated based on the overlapping of the three methodologies, and their different flowtype simulations.