

Ravicha Thaisiam 2014: Experimental Study of Gully Formation by Overland Flow and Groundwater Flow. Master of Engineering (Water Resources Engineering), Major Field: Water Resources Engineering, Department of Water Resources Engineering. Thesis Advisor: Assistant Professor Adichai Pornprommin, D.Eng. 137 pages.

Gully initiation can be classified by mechanisms to the erosion by surface water and subsurface water. In this study, gully formation by overland flow was analyzed by using the circular chamber. The experiments were performed in the apparatus chamber of 120 cm diameter and 28.5 cm height. In this study, three types ($D_{50} = 0.49, 0.30$ and 0.86 mm) of uniform-size sand were used. Thus, the flow was controlled in the radial direction and drained to the circular scarp at the center of the chamber. As a result, gully formation in this study was more symmetrical than other previous studies. In the beginning stage of the runs, overland flow is more dominant than groundwater flow. It is found that the eroding scarp can persist its circular shape for some period of time before bifurcation happened and many gullies started developing. This first stage that the scarp was stable reasonably agrees with the stability theory by Mizushima et al. (2007). As the overland flow decreased, groundwater became dominant, caused erosion at the toe of the scarp and induced slope failure. The effects of groundwater increased with larger size of sand.

Student's signature

Thesis Advisor's signature