



## **The hydrological impact of contour trenching in Vietnam**

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At the foothill in the driest rural area in Vietnam, at Ninh Thuan province, poor farmers cultivate up-land crops during the wet season. The area is about 9 hectares of deforested land with a slope up to 8% and has a geology surface of crusted sands and gravels. Water is scarce during the dry season and runs off rapidly during the wet season. Hence, to provide sustainable water resources and support crop growth, a project started in 2007 aiming introducing contour trenching. The main purpose of contour trenching is to trap run off, increase soil moisture for vegetation growth and recharge the groundwater. In order to investigate the impact of the trenches, a field monitoring program was initiated measuring rainfall, soil moisture content, surface water levels and groundwater levels. Recorded annual rainfall reached 600 mm. The groundwater levels are relatively deep and constant at -8 and -10 meters. The soil moisture content ranged from 3% at the driest condition to 37% below the trench at ponding. Water levels in trenches differed from uphill to downhill with higher levels at the first trench uphill. After ponding, water in the trenches infiltrates within a period of days. In this contribution, available field measurements are analyzed in two ways. First, runoff is analyzed. Immediately after significant rainfall events, the observed ponding levels in the trenches with defined uphill runoff areas can be related to the rainfall. The results show reduction of runoff coefficients per trench in downhill direction. Second, the two dimension numerical saturated-unsaturated model Hydrus 2-D was used to simulate the soil moisture content measurements. Model results confirm that infiltration is a quick process in this area with its loamy sand soils. Based on these analyzes, potential of contour trenches for local water retention and groundwater recharge will be discussed.