



## **Runoff production in a small agricultural catchment in Lao PDR : influence of slope, land-use and observation scale.**

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We study the surface and sub-surface hydrology of a small agricultural catchment (60ha) located in the Luang Prabang province of Lao PDR. This catchment is representative of the rural mountainous south east Asia. It exhibits steep slopes (up to 100% and more) under a monsoon climate. After years of traditional slash and burn cultures, it is now under high land pressures due to population resettling and environment preservation policies. This evolution leads to rapid land-use changes such as shifting cultivation reduction or growing of teak forest instead of classical crops. This catchment is a benchmark site of the Managing Soil Erosion Consortium since 1998. The international consortium aims to understand the effects of agricultural changes on the catchment hydrology and soil erosion in south east Asia.

The Huay Pano catchment is subdivided into small sub-catchments that are gauged and monitored. Different agricultural practices were tested along the years. At a smaller scale, plot of 1m<sup>2</sup> are instrumented to follow runoff and detachment of soil under natural rainfall along the monsoon season.

Our modeling work aims to develop a distributed hydrological model integrating experimental data at the different scales. One of the objective is to understand the impact of land-use, soil properties (slope, crust, etc) and rainfall (dry and wet seasons) on surface and subsurface flows.

We present here modeling results of the runoff plot experiments (1m<sup>2</sup> scale) performed from 2002 to 2007. The plots distribution among the catchment and over the years gives a good representativity of the different runoff responses. The role of crust, slope and land-use on runoff is examined. Finally we discuss how this plot scale will be integrated in a sub-catchment model, with a particular attention on the observed paradox: how to explain that runoff coefficients at the catchment scale are much slower than at the plot scale ?