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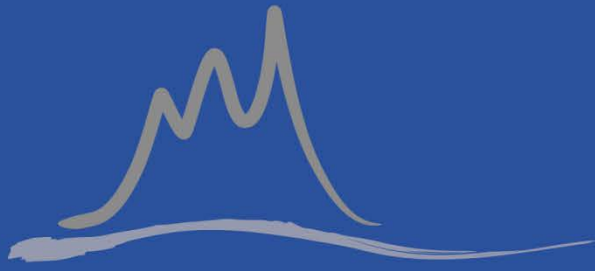
Topic: 06. Hazards and disaster risk reduction in the Mekong Basin

Balance of the erosion due to exceptional rain events and land use within agricultural hilly landscapes of the Great Mekong Region

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One-third of typhoons generated in the world occurred in Southeast Asia. They lead to huge disasters in terms of human and economic losses with social consequences. In Vietnam, the exceptional rain events, i.e. the typhoons, are the most frequent natural hazard occurring. Even if they occur especially on coastal areas of the Central Vietnam, typhoons cause also large rainfall events reputed to drive large soil losses in Northern Vietnam. However their environmental impact is not yet well documented. The aim of this paper was to clarify the importance of the exceptional events on soil erosion assessment in small, sloppy and cultivated watersheds in mountainous areas of the Great Mekong Region. The study has been set up on a 12 years long term period of erosion monitoring, from 1999 to 2011, coupled with meteorological and hydrological continuous records, within an agricultural hillslope watershed. The studied area has been affected by the typhoon Koni (21st to 23rd of July, 2003). This paper presents the hydrological and erosion analysis of this typhoon Koni in regard with 1999 to 2011 rainfall, runoff and erosion data records. First, rainfall and flood due to the typhoon Koni are characterized and a frequency analysis is performed. Then the contribution of the typhoon Koni on soil erosion budget is estimated. Finally the impact of the typhoon Koni on soil erosion is compared with erosion led by agricultural practices in order to evaluate the importance of exceptional rainy events on sediment discharge assessment in a perspective of the increase of exceptional events due to the climate change. The results show that this typhoon led to an exceptional rain event with a rainfall return period of 20 years, whereas a flood return period estimated to 32 years. The estimation of the sediment discharge reached 247 Mg (i.e. 4.9 Mg/ha) mainly exported through suspended matters. Compare to the global erosion assessment measured and estimated for the 12 years long time period, it appears that since the annual contribution of erosion due to the typhoon reach 80% at annual scale, the importance is less than 10 % over 32 years. This result demonstrates the low impact of this exceptional event on soil losses over a long term period. By consequence, this result underlines the importance of the agricultural practice management on the erosion budget over a long period. We underline the relative importance of agricultural practices compared to the exceptional events on notably the dam lake siltation. Moreover, the comparison between the soil erosion saving by the change of land use and the soil loss due to typhoon reveals that land use have a stronger importance over a long-term period. This underlines the benefits of conservation agriculture policies in order to provide a relevant issue in the integrated management of the mountainous areas of the Great Mekong Region.



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ABSTRACT VOLUME

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