

Impact of land-use change on the hydrology of North Lao PDR watersheds

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Abstract We investigated the impact of land-use change on the hydrology of different major Lao tributary watersheds of the Mekong River. The region is the North of Laos centred on Luang Prabang and the watersheds are the Nam Khan, Nam Ou, Nam Suong, Nam Lik and Nam Ngum. An additional small agricultural catchment called Houay Pano close to the Nam Khan, is also considered. We used the lumped rainfall-runoff conceptual models GR4J and GR2M, developed by Irstea in France, the Mekong River Commission hydro-meteorological database and the Japanese Aphrodite meteorological database. The objective was to detect in the hydrological regime of the watersheds any impact of de(re)forestation processes known to have occurred since the 1980s, but at a degree which has not been quantified. For this purpose we adopted the cross-simulation methodology developed by Irstea which has proved to be efficient to detect trends in long term watershed hydrology. The results did not show any significant hydrological change since 1960. On the other hand the application of the same methodology to the small catchment Houay Pano surveyed since 2001 proved to be convincing. We saw evidence of the impact of slash and burn practice, followed by a long fallow period, on a catchment's hydrology over a seven year period.

Key words Mekong tributaries; land-use change; conceptual models