

Changing trends of rainfall and sediment fluxes in the Kinta River catchment, Malaysia

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Abstract The Kinta River, draining an area of 2566 km², originates in the Korbu Mountain in Perak, Malaysia, and flows through heterogeneous, mixed land uses ranging from extensive forests to mining, rubber and oil palm plantations, and urban development. A land use change analysis of the Kinta River catchment was carried out together with assessment of the long-term trend in rainfall and sediment fluxes. The Mann-Kendall test was used to examine and assess the long-term trends in rainfall and its relationship with the sediment discharge trend. The land use analysis shows that forests, water bodies and mining land declined whilst built and agricultural land use increased significantly. This has influenced the sediment flux of the catchment. However, most of the rainfall stations and river gauging stations are experiencing an increasing trends, except at Kinta river at Tg. Rambutan. Sediment flux shows a net erosion for the period from 1961 to 1969. The total annual sediment discharge in the Kinta River catchment was low with an average rate of 1,757 t/km²/year. From 1970 to 1985, the annual sediment yield rose to an average rate of 4062 t/km²/year. Afterwards, from 1986 to 1993, the total annual sediment discharge decreased to an average rate of 1,306 t/km²/year and increased back during the period 1994 to 2000 to 2109 t/km²/year. From 2001 to 2006 the average sediment flux rate declined to 865 t/km²/year. The decline was almost 80% from the 1970s. High sediment flux in the early 1970s is partly associated with reduced tin mining activities in the area. This decreasing trend in sediment delivery leaving the Kinta River catchment is expected to continue dropping in the future.

Key words rainfall; sediment fluxes; water discharge; land use change; Kinta River, Malaysia