

Flow and Bank Erosion Characteristics of Sesayap River in Indonesia

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Rivers are a much-cherished feature of the natural world. They perform countless vital functions in both societal and ecological terms, including personal water consumption, health and sanitation needs, agricultural, navigation, and industrial uses, and various aesthetic, cultural and recreational associations. On the other hand, rivers can also be a source of disaster for human (e.g., river bank erosion). Bank erosion induced by alluvial river channel migration often causes problems which could cause civil facilities and properties damage if banks collapse abruptly.

River bank erosion records the balance of erosion and deposition processes induced by the energy of flow at different flow stages. Bank erosion is also a function of bank composition/texture. Bank composed of sand and gravel is more susceptible to erosion than those with high silt-clay content. In contrast the most channel bed and bank at the downstream reach tend to have some degree of cohesion because they contain fine-grained material.

This paper presents a numerical analysis of river channel erosion processes. As a case study, the Sesayap River of East Kalimantan Province, Indonesia was selected. Bank erosion along the Sesayap River Malinau has destroyed highway structures. The analysis for both bed erosion and bank failure processes is taken into account for the hydraulic force, bank geometry and bank material properties. Results of the numerical analysis clarify the influence of hydraulic variables on the pattern of bank erosion and

bed scouring. The results indicate that the bank erosion rate is affected by both the cohesive characteristics and size distribution of bed material very well. Some recommendations for further necessary channelization work such as banks stabilization structures are made.

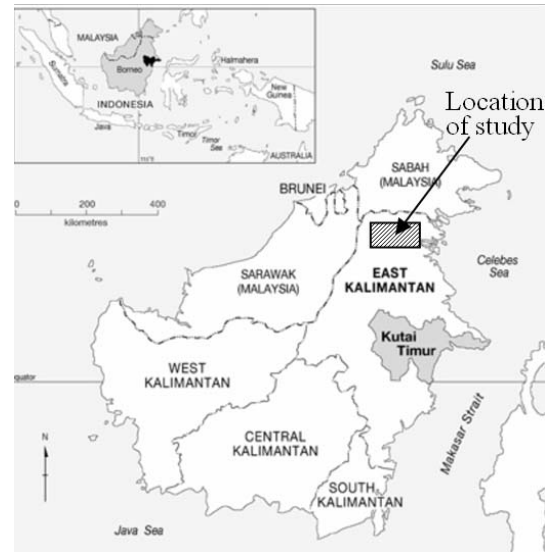


Fig. 1 Location of study at Malinau, East Kalimantan, Indonesia



Fig. 2 Collapse of river banks at Sesayap River, Malinau, East Kalimantan, Indonesia