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EFFECTS OF SOIL ERODIBILITY ON RIVERBANK EROSION AND FAILURES

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Abstract

Riverbank erosion is a natural process of removal of earthen materials from the bank surface. The process of riverbank erosion that is induced naturally results in the formation of landforms such as valleys, canyons, and productive floodplains. However, riverbank erosion can also be considered a hazard when the process occurs at an alarming rate causing loss of land. The extent of erosion depends on many factors. One of the main factors responsible for riverbank erosion is the soil erodibility which is the resistance of soil to erosion. The aim of this study is to quantify the riverbank erosion rates and

the potential magnitude of riverbank erosion in order to generate an empirical predictive model to estimate riverbank erosion from physical and geomorphic variables for rivers susceptible to riverbank erosion. Several models were trained using the Regression Learner application in MATLAB software. Models that include soil erodibility parameters perform better than the models without the soil erodibility parameters. The model with the highest accuracy was found to be Model 2, with Root Mean Square Error (RMSE) of 3.70×10^{-8} and coefficient of determination, R^2 of 0.55. The model produced in this study will be helpful to analyze and predict the effects of riverbank erosion and assist in the development of bank stabilization solution. © (2024), (International Islamic University Malaysia-IIUM). All Rights Reserved.

Author keywords

erosion pin; riverbank erosion; soil erodibility; Sungai Pusu

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