VIETNAM NATIONAL UNIVERSITY
HO CHI MINH CITY
UNIVERSITY OF TECHNOLOGY

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INFORMATION OF THE DISSERTATION

Dissertation's title: **Calculating Bank Erosion of the Dong Nai River in Cu Lao Rua area, and Proposing Mitigation Measures**

Major: **Natural resources and Environment Management**

Major code: **62850101**

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ASTRACT

Bank erosion and channeling are processes that occur with river-beds, which have negative impacts on the livelihoods of people and the loss of social assets. This thesis research studies the bank erosion issue at Cu Lao Rua (Thanh Hoi Island) located on Dong Nai river in Thanh Hoi commune, Tan Uyen town, Binh Duong province.

The situation of bank erosion at Cu Lao Rua has been going on for a long time, the rate of bank erosion has increased after the Tri An hydropower plant went into operation. At the same time, sand extraction activities in the riverbed have increasingly become a serious problem. These reasons posed the intensity and risk of bank erosion at Cu Lao Rua. Currently, due to the rapid erosion process, Cu Lao Rua is at risk of being cut in two parts at the turtleneck position. Therefore, the study on the mechanism and causes of bank erosion and landslides at Cu Lao Rua is a vital of concern in order to propose effective measures for controlling and preventing erosion events.

Within the mainstay of this thesis, a tool for bank erosion calculation (named as STABI) has been constructed. This calculation tool integrates 3 basic modules, including: (i) Module for calculating seepage flow at the riverbank; (ii) Module for stability analysis; and (iii) Module for bank erosion calculation. In addition, the thesis' author has applied F28 software in the combination of STABI to create a supporting tool for assisting the study on the changes of flow and evolution problem completely.

By applying the F28 software, an integrated 1D2D3D calculation model for flow and riverbed erosion was constructed in which Turtle Isle was modeled in the 3D visualization. With combination of F28 software and the STABI tool, the shoreline evolution model was established to identify the mechanism and causes of bank erosion and landslides at the study area (Cu lao Rua). The results achieved by F28 software has clearly shown the 3D flow structure at Cu Lao Rua. Further, the F28 software also provides the rates of riverbed erosion

and bank erosion caused by shoreline currents for STABI calculation tool. By combining F28 software and STABI tool, the calculation results show that the bend part at Turtle's neck will continue to be eroded.

The thesis has proposed non-structural solutions and structural solutions to prevent and minimize riverbank erosion at Turtleneck position on the tributary of the main river flow. In particularly, a vertical embankment with reinforced concrete slab piles has been proposed for the erosion site at Turtle's neck on the tributary side.

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