

KAJIAN SEDIMENTASI MUARA SUNGAI PEKALONGAN PROVINSI JAWA TENGAH

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08/276020/PTK/5197

Telah dipertahankan di depan Dewan Penguji
Pada tanggal 31 Desember 2010

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ABSTRACT

Pekalongan River is a downstream of Kupang River located in the area of Pekalongan City. The upper course is located in the earlier part of floodway with a downstream in Java Sea. On 2003 floodway was built as shortcut connecting Kupang River to Banger River for reducing floods frequently occurred in areas of Pekalongan City. By the floodway it can be expected that when annual maximum peak discharge occurred, the discharge of Kupang River does not overflow, so areas around the two rivers in the City will be relatively safe from floods. However, several parties mentioned that the floodway caused the decreased overflow of the rivers and sediments could not carry to the sea. Based on the statement, a question asked is whether or not the floodway encourages the increased sedimentation in estuaries of the two rivers in Pekalongan City.

This study was conducted to find out the effect of the building of floodway on mass capacity, mass out cumulative, and change in invert elevation change in estuaries of the rivers in Pekalongan City. Simulations were done by using the Hydrologic Engineering Center - River Analysis System (HEC-RAS) software version 4.0. The study used secondary data obtained from government instances and other parties related to the study.

Result of the study indicates that the building of floodway made discharge of the two rivers in Pekalongan City that flowed to lands from the confluence of Banger River and Kupang River to estuaries decreased at approximately 19.78%. At the end of simulation, discharge of lateral flow prior the building of floodway did not have significant difference in water surface profile with rate of 0.99 %, but increased flow velocity of 22.9%. The higher flow velocity increased the energy grade slope of 40.4%, the shear stress of 40.7%, dan the higher transport capacity of 84.8%. The larger transport capacity will be able to crush the larger bed of two rivers and increase the number of transported sediment, so the invert elevation of the end of simulation without shortcut was lower of 0.19% while total sediment transport was larger of 8.8%. There was no significant difference in invert elevation of the end of simulation between condition with and without the shortcut (0.19%). Therefore, it can be concluded that condition with shortcut was better because the shortcut could overcome the flood problems frequently occurred in the area of Pekalongan City.

Keywords: floodway, mass capacity, sedimentation, invert