

ABSTRACT

Gadjah Mada University is preparing a retarding basin to minimize flood water level in Sagan and Klitren Lor due to flow of Belik river. Sediment transport simulations performed to measure invert changes (m) so susceptible locations of aggradation and degradation can be determined as reference of retarding basin maintenance. Maintenance work able to maintain the design capacity of retarding basin and minimize the early damage of building potential.

Sediment transport simulated using HEC-RAS program version 4.1 . HEC - RAS 4.1 requires geometry modeling , quasi unsteady flow and gradation of sediment grain . The simulation results of sediment transport include invert changes (m) , the mass of sediments that enter and exit through cross section of channel and mass sediment left in each cross section of channel. Sediment transportation has simulated two times , the first period (September 23, 2013 to December 7, 2013) and the second period (January 29, 2014 to April 10, 2014) . HEC - RAS 4.1 displays the simulation results in some tables and plot.

In the first period, retarding basin having average aggradation value is 0,038m. In the second period, average aggradation value in retarding basin is 0,029 m. Susceptible locations of aggradation are in the amphitheater A, channel after a water barrier building, pond after the dam and the amphitheater B. Susceptible locations of degradation to be right after a water barrier building.

Keywords: *aggradation, degradation, retarding basin design capacity, gradation of soil grain and the amphitheater.*

INTISARI

UGM tengah menyiapkan kolam detensi sebagai solusi pengurangan tinggi muka banjir di Sagan dan Klitren Lor akibat aliran Kali Belik. Simulasi transpor sedimen dilakukan untuk mendapatkan besaran perubahan elevasi dasar kolam detensi, sehingga diketahui lokasi yang rentan terhadap aggradasi dan degradasi sebagai dasar perencanaan pemeliharaan kolam detensi. Kegiatan pemeliharaan dapat mempertahankan kapasitas kolam detensi dan mengurangi potensi kerusakan bangunan dini.

Transpor sedimen disimulasikan menggunakan program HEC-RAS versi 4.1. HEC-RAS 4.1 memerlukan permodelan geometri, peniruan aliran air dan data gradasi butir tanah. Hasil simulasi transpor sedimen berupa perubahan elevasi dasar saluran (m), massa sedimen yang masuk dan keluar melalui tampang saluran (ton) dan massa sedimen yang tertinggal di tampang saluran (ton). Simulasi dilakukan 2 kali, yaitu periode I (23 September 2013 hingga 7 Desember 2013) dan periode II (29 Januari 2014 hingga 10 April 2014). HEC-RAS 4.1 menampilkan hasil simulasi dalam bentuk tabel dan grafik.

Berdasarkan hasil simulasi, pada periode I rata-rata perubahan elevasi dasar kolam detensi mengalami aggradasi sebesar 0,038 m, pada periode II rata-rata perubahan dasar saluran untuk kolam detensi mengalami aggradasi sebesar 0,029 m. Lokasi rentan terjadi aggradasi berada di *Amphiteater A*, bagian kolam detensi setelah bangunan penahan banjir, kolam setelah bendung dan *Amphiteater B*. Lokasi rentan terjadi degradasi berada tepat setelah bangunan penahan banjir.

Kata kunci: aggradasi, degradasi, kapasitas desain kolam, gradasi butiran tanah, dan *amphiteater*.