

KAJIAN FUNGSI WADUK MRICA DALAM MENGENDALIKAN SEDIMENTASI SUNGAI SERAYU

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INTISARI

Waduk Mrica mengalami sedimentasi intensif akibat degradasi DAS Serayu Hulu. Degradasi DAS Serayu Hulu dipercepat oleh adanya ekspansi lahan pertanian dari tahun ke tahun. Perubahan penggunaan lahan berpotensi mengakselerasi erosi di DAS Serayu Hulu. Permasalahan tersebut dikaji untuk mengetahui variasi spasial erosi tanah DAS Serayu Hulu dan kapasitas Waduk Mrica dalam mengendalikan sedimentasi. Penelitian ini menggunakan data sekunder terkait variabel erosi tanah metode USLE dan data hasil pemantauan parameter Waduk Mrica tahun 2020 yang terdiri atas kapasitas tampungan waduk, volume sedimen, dan efisiensi tangkapan sedimen (ETS). Estimasi total erosi tanah metode USLE dikomparasikan dengan volume sedimen Waduk Mrica melalui kalkulasi nilai nisbah pelepasan sedimen (NPS). Hasil penelitian menunjukkan bahwa mayoritas wilayah DAS Serayu Hulu terletak pada zona kerawanan erosi tingkat sangat berat dengan laju erosi tanah lebih dari 480 ton/ha/tahun dan total erosi sebesar 58,47 juta ton. Faktor erosivitas hujan yang besar, erodibilitas tanah yang cukup tinggi, kemiringan lereng yang relatif curam, dan penggunaan lahan yang didominasi tegalan berkontribusi besar terhadap tingginya laju erosi tanah. Nilai NPS DAS Serayu Hulu relatif kecil yakni sebesar 0,0046 persen. Meskipun begitu, besarnya total erosi berpengaruh signifikan terhadap sedimentasi Waduk Mrica. Penurunan nilai ETS mengindikasikan sedimentasi sudah berlebihan sehingga kemampuan waduk dalam mengendalikan sedimentasi semakin terbatas.

STUDY OF THE FUNCTION OF MRICA RESERVOIR IN CONTROLLING SEDIMENTATION OF SERAYU RIVER

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ABSTRACT

Mrica Reservoir has been subjected to prolonged sedimentation due to the degradation of Serayu Upper Catchment. It has been accelerated by agricultural land expansion and potentially triggered worse erosion. The issue was carried out to identify the spatial distribution of erosion occurring in Serayu Upper Catchment and the capacity of Mrica Reservoir to control sedimentation. The research utilized secondary data consisting of USLE's variables and monitoring data of Mrica Reservoir in 2020 that encompasses reservoir pool capacity, sediment yield, and trap efficiency. Total erosion estimated through USLE was compared with the reservoir's sediment yield to determine sediment delivery ratio (SDR). The results showed that the vast majority of the catchment was situated in a severely susceptible-to-erosion zone, with an erosion rate surpassing 480 tons/ha/year and a total erosion of 58.47 tons. Erosive rainfall, moderate soil erodibility, steep topography, and dry cropland-dominant landuse were considered contributive factors to high erosion rates. The SDR value of the catchment was relatively low at 0.0046 percent, yet the value means significant as the total erosion was extremely many and resulted in intensive sedimentation. The decline of trap efficiency indicated that the sedimentation has been excessive hence the reservoir capacity to manage sedimentation becomes more limited.

Keywords: *erosion, sediment delivery ratio, sedimentation, trap efficiency, USLE*