PENGENDALIAN SEDIMENTASI SUNGAI DENGAN PENERAPAN TEKNIK EKOHIDRAULIK PADA SUB DAS BOMPON, KABUPATEN MAGELANG, JAWA TENGAH

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INTISARI

Sub DAS Bompon berada di Kabupaten Magelang, Jawa Tengah. Sub DAS Bompon terkena bencana, bencananya diantaranya adalah gerakan massa tanah, erosi dan kekeringan. Terjadinya erosi diakibatkan adanya *runoff* yang tinggi sehingga tanah maupun batuan menjadi terkikis dan material yang lepas akan masuk ke badan sungai. Material yang masuk ke badan sungai ada yang mengendap dan ada yang melayang pada sungai. Dampak adanya sedimentasi maka terjadi pendangkalan sungai. Maka dari itu, diperlukan penelitian untuk mengkaji kualitas air sungai secara fisik dan kimia, mengetahui jumlah material sedimen yang masuk ke badan sungai dan arahan desain ekohidraulik pada Sub DAS Bompon.

Metode yang digunakan adalah metode survey dan pemetaan, analisis laboratorium, matematis dan evaluasi. Material sedimen yang dikaji meliputi sedimen suspensi dan sedimen dasar. Sedimen suspensi diperoleh melalui analisis laboratorium (konsentrasi sedimen) dan uji langsung (debit aliran sungai), kemudian dihitung secara matematis sehingga didapat debit muatan sedimen suspensi. Sedangkan sedimen dasar diperoleh melalui analisis laboratorium (ukuran butir, berat jenis) dan uji langsung (debit aliran sungai), kemudian dihitung secara matematis sehingga didapat debit muatan sedimen dasar. Parameter yang digunakan berupa sifat fisik (kekeruhan, TSS dan TDS) dan sifat kimia (pH dan nitrat). Parameter disesuaikan Peraturan Pemerintah No. 82 Tahun 2001 tentang Pengelolaan Kualitas Air Pengendalian Pencemaran Air.

Hasil yang didapat dari pengujian kualitas air sungai yang melebihi bakumutu yaitu parameter kekeruhan. Jumlah material sedimen suspensi yang tertinggi, sungai hulu sebesar 93,15160 ton/tahun, untuk sungai tengah sebesar 1837,67461 ton/tahun dan untuk sungai hilir sebesar 13734,1666 ton/tahun. Jumlah material sedimen dasar yang tertinggi sungai hulu sebesar 0,773 ton/tahun, untuk sungai tengah sebesar 4,6777 ton/tahun dan untuk sungai hilir sebesar 10,31234 ton/tahun. Pendekatan mekanis dan vegetatif menggunakan ekohidrolika yang digunakan menahan erosi adalah pagar datar dan penanaman tebing. Jarak tanam bambu berjarak 2 m. Pagar datar menancapkan pilar sampai 50 cm kedalam tanah, jarak antar pilar 80 cm. Penggunaan tanaman dalam bentuk bambu, sengon dan rumput vetiver. Konservasi berbasis masyarakat dan dengan pendekatan pemerintah. Bendung tradisional pada sungai hulu memiliki dimensi panjang melintang 95 cm, lebar 50 cm, tinggi 1 m dan ruang jalur ikan 15 cm. Bendung tradisional pada sungai tengah memiliki dimensi panjang 2,73 m, lebar 50 cm, tinggi 2,5 m dan ruang jalur ikan 15 cm. Bendung tradisional pada sungai hilir memiliki dimensi panjang 5,63 m, lebar 50 cm, tinggi 5 m dan ruang jalur ikan 15 cm.

Kata Kunci : Ekohidraulik, Kualitas Air, Sedimen Suspensi, Sedimen Dasar, Erosi

CONTROL OF RIVER SEDIMENTATION WITH THE IMPLEMENTATION OF ECOHIDRAULIC TECHNIQUES IN BOMPON SUB-WATERS, MAGELANG DISTRICT, CENTRAL JAVA

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ABSTRACT

Bompon Sub-watershed is located in Magelang Regency, Central Java. This sub-watershed is affected by disasters, including mass movements, erosion, and drought. The occurrence of erosion is mainly caused by high runoff, allowing soil and rocks to erode and loose materials to enter the river body. Some of the materials that enter the river deposits, while the rest float on the water surface. The impact of this sedimentation is the silting of the river. Therefore, a study is needed to assess the river water quality both physically and chemically, in order to determine the amount of the sediment materials entering the river body and the directives of the hydraulic design in the Bompon Sub-watershed.

The methods used in this study covered survey and mapping, mathematical and laboratory analyses, and evaluation. The sediment materials on question included not only suspended sediment but also basic sediment. The first type of sediment (suspended sediment) was obtained through laboratory analysis (sediment concentration) and direct test (river flow discharge), then calculated mathematically to obtain its discharge. Whereas the later one (basic sediment) was obtained through a laboratory analysis (grain size, specific gravity) and direct test (river flow discharge), then calculated mathematically to obtain a basic sediment discharge. The parameters were set for physical properties (turbidity, TSS, and TDS) and chemical properties (pH and nitrate). These parameters are in accordance with Government Regulation No. 82 of 2001, concerning Water Quality Management and Water Pollution Control.

The results obtained from testing the quality of river water that exceeds bakumutu are turbidity parameters. The highest amount of suspended sediment material, upstream river is 93.15160 tons / year, for the middle river is 1837.67461 tons / year and for the downstream river is 13734.1666 tons / year. The highest amount of basic sediment material upstream is 0.773 tons / year, for the middle river is 4.6777 tons / year and for the downstream river is 10.31234 tons / year. Mechanical and vegetative approaches using ecohydrolics that are used to resist erosion are flat fences and cliff planting. Bamboo spacing is 2 m away. Flat fence sticks a pillar up to 50 cm into the ground, the distance between pillars is 80 cm. Use of plants in the form of bamboo, sengon and vetiver grass. Community-based conservation and government approaches. Traditional weir on the upstream river has a dimension of 95 cm in transverse length, 50 cm in width, 1 m in height and 15 cm of fish lane space. Traditional weirs in the middle river have dimensions of 2.73 m in length, 50 cm in width, 2.5 m in height and 15 cm of fish lane space. Traditional weir on the downstream river has dimensions of 5.63 m in length, 50 cm in width, 5 m in height and 15 cm in fish lane space.

Keyword : **Ecohydraulics, Water Quality, Suspended Load, Bed Load, Erosion**