INTISARI

Waduk Mrica merupakan salah satu waduk di Pulau Jawa yang saat ini telah terjadi sedimentasi yang sangat tinggi. Kondisi ini menyebabkan umur layanan waduk tidak sesuai lagi dengan umur perencanaan. Tujuan penelitian ini adalah untuk mengetahui imbangan sedimen (*sediment balance*) dan sisa umur layanan (*useful life*) waduk berdasarkan kondisi eksisting dan tanpa atau dengan pengelolaan.

Imbangan sedimen merupakan neraca masukan dan keluaran sedimen. Sedimen masuk diperkirakan dari erosi lahan dan *rating curve* sedimen. Sedimen mengendap berdasarkan data pengukuran *echosounding*. Distribusi sedimen keluar melalui *flushing*, penambangan, pengerukan, *intake*, dan limpasan *spillway*. Estimasi sisa umur layanan waduk berdasarkan laju sedimentasi, *curve fitting linier*, metode kapasitas tampungan mati, dan distribusi sedimen. Strategi pengelolaan sedimentasi dilakukan secara terpadu melalui pengelolaan DAS, pengelolaan alur sungai, dan penanganan sedimen di waduk.

Berdasarkan hasil penelitian diperoleh bahwa sedimen yang masuk sebesar 5,869 juta m^3/tahun, laju sedimentasi sebesar 4,097 juta m^3/tahun, sehingga sedimen yang dikeluarkan dapat sebesar 1,772 juta m^3/tahun. Prediksi sisa umur layanan waduk tanpa rencana pengelolaan menunjukkan bahwa umur layanan waduk masih sekitar 2 tahun sampai dengan tahun 2017. Total manfaat rencana pengelolaan sedimentasi tahun 2016 – 2025 rerata sebesar 3,279 juta m^3/tahun. Setelah pengelolaan diperkirakan sedimen masuk sebesar 4,845 juta m^3/tahun melalui debit bangkitan, sedimen keluar sebesar 4,519 juta m^3/tahun, sehingga laju sedimentasi sebesar 326 ribu m^3/tahun. Pengelolaan sedimentasi mampu memperpanjang umur layanan waduk melebihi umur perencanaan. Berdasarkan distribusi sedimen, bahwa jika tanpa pengelolaan *intake* sudah tertutup oleh sedimen pada akhir tahun 2016. Namun jika dengan rencana pengelolaan *intake* baru tertutup pada akhir tahun 2025.

Kata kunci : sedimentasi, imbangan sedimen, sisa umur layanan, pengelolaan sedimentasi

ABSTRACT

Mrica Reservoir is one of reservoir in Java Island that has a big sedimentation problem. This condition causes useful life of reservoir is no longer match plan. The aim of this research was to know sediment balance and useful life of reservoir based on existing condition and with or without of management of sedimentation.

Sediment balance is a balance of inflow and outflow sediment in reservoir. Sediment inflow was estimated from sheet erotion (secondary data) and sediment rating curve. Deposited sediment was based on measuring of echosounding. Distribution of sediment outflow such as flushing, sand mining, dredging, intake, and over flow. The residue of useful life is predicted based on sedimentation rate, curve fitting linier, reduction of deadstorage method, and sediment of distribution method. Strategies for managing reservoir sedimentation are done with watershed conservation, managing of river channel, and handling deposited sediment in reservoir.

Based on result of this research was obtained that sediment inflow was 5,869 million m^3/yr, deposited sediment was 4,097 million m^3/yr, then sediment outflow was 1,772 million m^3/yr. Useful life of reservoir without managing sedimentation is predicted still 2 years again or until 2017. Total benefit of planing of managing sedimentation 2016 – 2025 is 3,279 million m^3/yr. After managing sedimentation, sediment inflow is predicted equal to 4,845 million m^3/yr from flow generation, sediment outflow was 4,519 million m^3/yr, then deposited sediment is 0,326 million m^3/yr. Managing sedimentation in this research can elongate useful life over useful life of planing. Based on distribution of sediment that if without managing sedimentation, intake has closed by sediment in end of 2016. However if with managing sedimentation, intake has closed in end of 2025.

***Keywords** : sedimentation, sediment balance, useful life, managing sedimentation, resevoir*