SUMMARY

Vicky Achmad Tanjung Suyitno, Department of Industrial Engineering, Faculty of Engineering, University of Brawijaya, Agustus 2016, *Evaluation of Sediment Dredging of Sengguruh Reservoir (Case Study: PT. PJB Up. Brantas, Kab. Malang)*, Academic Supervisor: Yeni Sumantri dan Wifqi Azlia.

PT. PJB Up.Brantas is one BUMN company that is engaged in Hydroelectric Power Plant (HEPP) in Malang. In order to get the maximum power production, then it is required adequate water as a source of turbines to generate electricity; the reservoir is the most important element because the reservoir has a function for storing water which then will be used as a source of hydropower plants. However, currently reservoir which is located in Karangkates is very worrying because it has not been dredged optimally due to sedimentation that goes continuously and the number of existing dredging is still not able to meet the existing sedimentation rate. Therefore, in order to dredging in the reservoir proceed optimally then it is conducted the evaluation of dredging during this run so that dredging is running optimally by calculating the rate of sedimentation that occur each year and comparing with the amount of dredging done every year, analyzing trap efficiency Sengguruh Reservoir, considering several alternatives in dredging activities and analyzing aspects of the cost incurred by the company on each alternative.

In this study, it was conducted the calculating of the sedimentation average rate entering the Sengguruh Reservoir annually, then calculating the average dredging conducted by the company and comparing it with the amount of sediment entering the Sengguruh Reservoir, counting trap efficiency of Sengguruh Reservoir in order to determine the condition of Sengguruh Reservoir. On the financial aspects, it was conducted the financial assessment of the reservoir dredging activities using several techniques to determine the feasibility of an activities or investments includes: Net Present Value (NPV), Internal Rate of Return (IRR), and Benefit Cost Ratio (BCR). Then based on the calculation of the dredging amount done of every alternative and the results of the financial aspects can be calculated which one is the best alternative to offset the amount of sedimentation, the most viable and profitable for the company.

From the analysis results of the calculation of the dredging amount which was done on each alternative, the third alternative was decent chosen because the dredging amount of the third alternative can offset the rate of sedimentation in the Sengguru Reservoir, while the feasibility analysis of the financial aspects of the Sengguruh Reservoir stated that all alternative feasible to be conducted, because the value of NPV is positive, B / C> 0, IRR> bank interest rates, because all the analysis of financial economics is feasible then the priority election of the best alternative is to consider alternatives that may offset the amount of sedimentation which occurs in the third alternative. The dredging amount of the third alternative is done by 273,000 m^3 from the sedimentation rate of 212,000 m3. The third alternative will be selected with the details of the calculation: Total Cost which will be issued is Rp. 161,169,248,122, Total Benefit is Rp.266,751,641,379, B / C is 1.66, IRR is 38.70%, and a NPV is Rp. 33,901,555,255.

Keywords : Sengguruh Dam, *Trap Efficiency*, Sedimentation, *Net Present Value* (NPV), *Internal Rate of Return* (IRR), *Benefit Cost Ratio* (BCR).