

COST-BENEFIT ANALYSIS OF SEDIMENT MANAGEMENT
IN SUTAMI DAM, EAST JAVA, INDONESIA

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ABSTRACT

The impacts of global climate change (i.e. floods, sedimentation, etc.) have been recognized as the main threat of the sustainability of water resources infrastructures (i.e. dams, barrages, etc.). In the basin level, reservoir is the most susceptible infrastructure to the impacts, particularly to sedimentation. It will progressively reduce the reservoir storage and in many cases threatens the economic life of reservoir. Sediment management is one of the techniques to enhance the economic life of reservoir. However, most of sediment management projects were conducted based upon the necessity to remove the sediment only without considering the profitability of the project itself. Departing from economic analysis will cause some consequences to the project, such as project cost overrun and other budget-related problems. Thus, this study aims to determine the economic feasibility of sediment management project in Sutami dam by using the Cost-Benefit Analysis. Based upon several secondary data and assumptions, five (5) possible project alternatives were simulated in this study. The differences among those projects are on the method of sediment disposal and the volume of sediment dredged. The analysis found that among those alternatives, the most desirable project is alternative project 2, whereby the dredged sediment volume is 300,000 m³ per year using the off-stream sediment disposal method. This alternative has the largest B/C ratio (1.21) and the maximum net benefit (Rp. 7,780.3 million). The analysis also indicates that the changes in sediment disposal method and/or volume of sediment to be dredged will extremely raise the costs that cannot sufficiently recover by the benefits gained. A basic framework of the Cost-Benefit Analysis application in sediment management has been developed in this study. This framework is able to simplify the use of Cost-Benefit Analysis in determining the feasibility of sediment management in reservoirs, particularly those located in Brantas river basin.