

ECO FRIENDLY MINI HYDROPOWER PROJECT: A CASE STUDY OF SRIPADAGAMA

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Sri Lanka is facing a severe crisis in meeting the growing power demand. Even though, small-scale hydropower is one of the best solutions to meet the increasing demand, such projects should be properly designed, evaluated and monitored. Acceptable modeling techniques should be followed in hydrological studies within the framework of sustainable development. Thus, this study was conducted to investigate the potential for establishing a mini-hydropower in Sripadagama in Kalu Ganga in the Sabaragamuwa province in Sri Lanka.

A complete model that includes hydrological and economic components was developed. A detailed hydrologic investigation using liner- non-linear tank concept was carried out to predict the stream flow. Benefit transfer methods were employed to value the environmental losses due to the project such as deforestation, biodiversity losses, vulnerability of land slides, soil erosion, risk of dam failure and externalities. The extended cost benefit analysis was employed to evaluate the eco-friendly nature of the project.

Both hydrological and economical analyses show the viability of supplying 7.9 GWh/year. The accuracy of predicting the stream flow at the dam site is 89.3%. The economic analysis of the study show net present value of Rs. 932.7 mn, internal rate of return 38% and benefit cost ratio 8.1. The results of the sensitivity analysis show that the project is relatively less sensitive to changes in costs while more sensitive to changes in its benefits. Mitigatory measures and corrective actions particularly to geo-hazards are suggested for sustainability of the project.