

Economic analyses of two dendropower plants in Sri Lanka

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Dendropower is a variety of thermal power that generated using fuel wood as the raw material producing thermal energy or electricity as the final output. Dendropower can be proposed as an option to the existing power crisis in Sri Lanka. The present study evaluates the viability of two selected dendropower plants in Sri Lanka using Cost Benefit Analysis (CBA). Data collection was done by questionnaire surveys, personal communication and with the use of secondary data sources. A power plant with a capacity of 5 kW operated under the management of a Community Based Organization (CBO) in an off grid area in Moneragala district (case 1) and a power plant with a capacity of 3.5 kW operated under a private ownership in a high yielding coconut estate (case 2) were selected as

two study sites. Both power plants produce electricity by gasification and internal combustion engine technologies using in-situ grown *Gliricidia sepium* sticks. The major costs of both projects were initial costs of power plant installation, operational and maintenance costs. The major benefits of case 1 were crop protection from wild animals and electricity benefit and major benefits of case 2 were fertilizer substitution benefit from *Gliricidia* leaves and electricity benefit. For the calculations it was assumed that the net carbon dioxide emission was close to zero at both sites. According to the results, case 1 is viable with a positive Net Present Value (NPV) of Rs. 1,195,777 at 10% discount rate for 20 year period of time. The case 2 is viable with a positive NPV of Rs. 1,063,450.94 at 10% discount rate for a 20 year period of time. Both cases are viable from the economic point of view for a 20 year period of time even with a 10% increase of total cost and a 10% reduction in total benefits. The study recommends that the dendropower plants are viable from the economic point of view where there are enough lands are available to grow sustainably grown fuel wood.