

Energy Recovery from the Gravity-fed Mawathagama Galagedara Integrated Water Supply Project

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The water sector is committed to contributing towards “affordable and clean energy” Sustainable Development Goal by reducing carbon foot print of the water supply projects. Accordingly, the excessive pressure generated in pipelines in gravity-fed water supply systems that is usually dissipated by break pressure tanks is given attention as source for recovering energy using micro hydropower plants (MHPP). This study presents a Case Study of economic feasibility of integration of a MHPP to recover dissipating hydro energy in the gravity-fed Mawathagama Galagedara Integrated Water Supply Project (MGIWSP) by the deployment at different stages of the project. Economic analysis of following three cases were carried out considering revenue and cost streams; the cost anticipated for the MHPP installations, operation and maintenance, and revenue by selling electric energy to the Ceylon Electricity Board. NPV, IRR, payback period, benefit cost ratio and debt service coverage ratio are used to investigate the economic feasibility of three cases.

- a. MHPP is integrated at the project design. Cost increase due to the pipe modification and MHPP is the capital cost. Here cross- saving is considered.
- b. MHPP is integrated at the project design. But the cost of the pipe installation and MHPP is the capital cost. Cross-saving not considered.
- c. Installation of MHPP as a later option after water supply project is done. Total modification cost included.

In Case (a) NPV is Rs. 42 MN, IRR of 34%. Case (b) was not economically feasible and Case (c) was only marginally feasible. According, MHPP should have been added at the planning stage and it is not economically feasible to install a MHPP to MGIWSP now.

Keywords: Micro hydropower, Water supply, Energy recovery, Economic feasibility