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Critical Terrain Slope Calculation for Locating Small Hydropower Plants

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Abstract : As known, the water energy is a renewable and clean source of energy. Energy production from hydropower has been the first, and still is today a renewable source used to generate electricity. The optimal location and sizing of a small hydropower plant is a very important issue in engineering design which encourages investigation. The aim of this paper is to present a formula that can be utilized for locating the position of a small hydropower plant although there is a high dependence on economic, environmental, and social parameters. In this paper, the economic and technical side of the problem is considered. More specifically, there is a critical terrain slope that determines if the plant should be located at the end of the slope or not. Of course, this formula can be used for a first estimate and does not include detailed economic analysis. At the end, a case study is presented for the location of a small hydropower plant in order to demonstrate the validity of the proposed formula.

Keywords : critical terrain slope, economic analysis, hydropower plant locating, renewable energy
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