ANALISIS SISTEM PENDUKUNG KEPUTUSAN MULTI KRITERIA UNTUK MENENTUKAN POTENSI LOKASI PEMBANGKIT LISTRIK TENAGA MIKROHIDRO MENGGUNAKAN METODE *ANALYTIC HIERARCHY PROCESS* DAN *FUZZY*-TOPSIS

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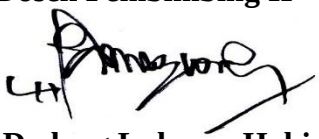

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ABSTRAK

Pembangkit Listrik Tenaga Mikrohidro (PLTMH) merupakan sumber energi terbarukan yang ramah lingkungan dengan tidak menimbulkan polusi yang berbahaya serta emisi gas rumah kaca. Pencarian lokasi yang berpotensi untuk pembangunan PLTMH mempertimbangkan banyak sub-kriteria diantaranya debit air, *head*, curah hujan, kemiringan, penggunaan lahan, jarak ke gardu induk, konservasi area, biaya, keuntungan, dan perizinan. Dari banyaknya sub-kriteria perlu adanya metode analisis untuk mengambil keputusan. Penelitian ini bertujuan untuk mengembangkan sistem pendukung keputusan multi kriteria berbasis teknologi kecerdasan buatan yaitu *Analytic Hierarchy Process* (AHP) dan *Fuzzy*-TOPSIS untuk menentukan potensi lokasi PLTMH. Metode *Analytic Hierarchy Process* (AHP) dapat dijadikan *tool* yang efektif dan terbaik dalam membuat keputusan untuk mengurutkan tingkat prioritas dari banyaknya sub-kriteria. Metode *Fuzzy*-TOPSIS dapat menentukan potensi lokasi PLTMH terbaik dari berbagai alternatif lokasi. Dalam penelitian ini, bahwa lokasi Sungai Batang Tapan, Kecamatan Basa Ampek Balai Tapan, Kabupaten Pesisir Selatan, Sumatera Barat terpilih sebagai potensi lokasi terbaik untuk dijadikan Pembangkit Listrik Tenaga Mikrohidro (PLTMH).

Kata Kunci: PLTMH, *Analytic Hierarchy Process*, *Fuzzy-TOPSIS*, Lokasi.

ABSTRACT

Micro Hydro Power Plant (MHPP) is a renewable energy source that appears a safe environment without causing harmful pollution and greenhouse gas emissions. The search for potential locations for the construction of MHPP considers any sub-criteria including water discharge, head, rainfall, slope, land use, distance from power grid, conservation area, cost, profit, and permit. From those sub-criteria, it is necessary to have an analytical method for making decisions. This research purposes to develop a Multi-Criteria Decision Making System based on artificial intelligence technology are Analytic Hierarchy Process (AHP) and Fuzzy-TOPSIS to determine the potential location of MHPP. The Analytic Hierarchy Process (AHP) method can be used as an effective and proper tool in making decisions to sort the priority levels of the sub-criteria. The Fuzzy-TOPSIS method can determine the potential location of the best MHPP from various alternative locations. In this reseach, the location of Batang Tapan River, Basa Ampek Balai Tapan Sub-district, South Pesisir District, West Sumatera Province is selected as proper location to be use as Micro Hydro Power Plant (MHPP).

Keywords: *MHPP, Analytic Hierarchy Process, Fuzzy-TOPSIS, Location.*

DAFTAR ISI

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