PENGEMBANGAN SISTEM PENDUKUNG KEPUTUSAN MULTI KRITERIA UNTUK EVALUASI KELAYAKAN LOKASI PEMBANGKIT LISTRIK TENAGA ANGIN MENGGUNAKAN METODE *FUZZY ANALYTIC HIERARCHY PROCESS*

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ABSTRAK

Pengembangan sumber energi terbarukan terus dilakukan sebagai upaya diversifikasi energi, termasuk pembangunan Pembangkit Listrik Tenaga Angin (PLT-Angin). Proses penentuan lokasi yang tepat sangat diperlukan agar tempat yang dipilih benar-benar optimal dan memiliki nilai ekonomis yang tinggi. Pertimbangan penentuan lokasi PLT-Angin ini melibatkan banyak kriteria (multi kriteria) seperti kecepatan angin, kondisi iklim, akses jalan, dampak lingkungan, penggunaan tanah, kemiringan, dataran, jarak ke pemukiman, dan lain-lain. Penelitian ini bertujuan untuk mengembangkan sebuah perangkat pendukung keputusan multi kriteria berbasis teknologi kecerdasan buatan, yaitu *Fuzzy Analitic Hierarchy Process* (*Fuzzy*-AHP) yang akan diimplementasikan untuk mengevaluasi kelayakan penentuan lokasi PLT-Angin. Metode *Fuzzy*-AHP mampu menghasilkan prioritas kriteria pendukung lokasi PLT-Angin dengan nilai akurasi yang tinggi. Berdasarkan kriteria tersebut, dua lokasi di wilayah Kabupaten Tanah Laut, Kalimantan Selatan yang menjadi lokasi ujicoba dalam penelitian ini telah dievaluasi dan yang paling cocok telah ditentukan. Dengan penelitian ini, metode *Fuzzy*-AHP diharapkan dapat terus dikembangkan untuk menentukan lokasi pembangkit energi terbarukan dengan area yang lebih luas.

Kata Kunci : Multi Kriteria, Lokasi, PLT-Angin, *Fuzzy Analytic Hierarchy Process*

ABSTRACT

The development of renewable energy sources continues to be carried out as an effort to diversify energy, including the construction of Wind Power Plants. The process of determining the exact location is needed so that the selected place is truly optimal and has high economic value. The considerations for determining the location of wind farm according to many criteria (multi-criteria) such as wind speed, climatic conditions, road access, environmental impact, landuse, slope, terrain, distance from residential area, and others. This research aims to develop a multi-criteria artificial intelligence decision support tool, namely the Fuzzy Analytic Hierarchy Process (Fuzzy-AHP) which will be implemented for the feasibility of determining the location of wind farm. The Fuzzy-AHP method is able to produce priority criteria for supporting wind farm site selection with high accuracy values. Based on these criteria, two locations in the Tanah Laut, South Kalimantan which were the test locations in this research have been evaluated and the most suitable site have been determined. With this research, the Fuzzy-AHP method is expected to continue to be developed to determine the location of renewable energy sources in a wider area.

Keywords : *Multi Criteria, Location,* PLT-Angin, *Fuzzy Analytic Hierarchy Process*

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