

**PENERAPAN SISTEM PENDUKUNG KEPUTUSAN MULTI KRITERIA  
BERBASIS GIS UNTUK PENENTUAN LOKASI *HYBRID RENEWABLE  
ENERGY SYSTEM*: STUDI KASUS PROVINSI LAMPUNG**

**SKRIPSI**

Diajukan untuk memenuhi sebagian syarat memperoleh gelar Sarjana  
Pendidikan Teknik Elektro Konsentrasi Teknik Tenaga Listrik



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**PROGRAM STUDI PENDIDIKAN TEKNIK ELEKTRO  
FAKULTAS PENDIDIKAN TEKNOLOGI DAN KEJURUAN  
UNIVERSITAS PENDIDIKAN INDONESIA  
BANDUNG  
2024**

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Oleh  
Agil Chairulloh

Sebuah skripsi yang diajukan untuk memenuhi salah satu syarat memperoleh gelar  
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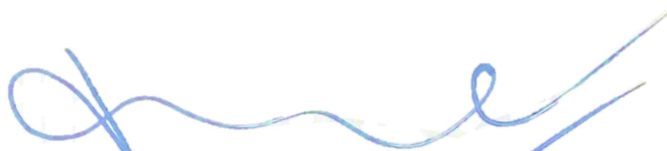
**AGIL CHAIRULLOH**

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BERBASIS GIS UNTUK PENENTUAN LOKASI *HYBRID RENEWABLE*  
*ENERGY SYSTEM*: STUDI KASUS PROVINSI LAMPUNG**

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## LEMBAR PERNYATAAN

Dengan ini saya menyatakan bahwa skripsi dengan judul “**PENERAPAN SISTEM PENDUKUNG KEPUTUSAN MULTI KRITERIA BERBASIS GIS UNTUK PENENTUAN LOKASI *HYBRID RENEWABLE ENERGY SYSTEM*: STUDI KASUS PROVINSI LAMPUNG**” ini beserta seluruh isinya adalah benar-benar karya saya sendiri. Saya tidak melakukan penjiplakan atau pengutipan dengan cara-cara yang tidak sesuai dengan etika ilmu yang berlaku dalam masyarakat keilmuan. Atas pernyataan ini, saya siap menanggung risiko/sanksi apabila di kemudian hari ditemukan adanya pelanggaran etika keilmuan atau ada klaim dari pihak lain terhadap keaslian karya saya ini.

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Bandung, 17 April 2024

Penulis

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## ABSTRAK

Penggunaan bahan bakar fosil untuk pembangkit listrik mengakibatkan dampak buruk bagi lingkungan dan menjadikan ketersediaannya semakin menipis. Hal ini yang mendorong beberapa negara beralih ke energi terbarukan sebagai sumber pembangkit listrik. Dalam beberapa tahun ke belakang, *Hybrid Renewable Energy System* (HRES) khususnya tenaga surya dan angin banyak dipertimbangkan karena memiliki potensi besar dalam transisi energi menuju energi ramah lingkungan. Langkah pertama dan paling vital untuk perluasan penggunaan listrik dari HRES adalah penentuan lokasi. Perbandingan dari dua metode *Multi-Criteria Decision Making* (MCDM) yaitu *Technique for Order of Preference by Similarity to Ideal Solution* (TOPSIS) dan *Simple Additive Weighting* (SAW) yang keduanya terintegrasi dengan *Geographic Information System* (GIS) digunakan untuk pengambilan keputusan lokasi HRES. Terseleksi sembilan kriteria yang digunakan dan aspek iklim serta lokasi merupakan aspek yang paling banyak diperhitungkan oleh peneliti melalui jurnal-jurnal internasional. Metode TOPSIS-GIS memperoleh hasil bahwa Desa Tamansari, Kecamatan Pugung, Kabupaten Tanggamus (A3) terpilih sebagai alternatif paling optimal untuk lokasi HRES di Provinsi Lampung dengan nilai kedekatan terhadap solusi ideal sebesar 0,62775. Begitu juga dengan metode SAW-GIS, alternatif A3 terpilih sebagai alternatif paling optimal untuk lokasi HRES di Provinsi Lampung dengan nilai sebesar 0,73369. Dengan pendekatan MCDM ini, lokasi terbaik untuk HRES telah ditentukan, dan Desa Tamansari, Kecamatan Pugung, Kabupaten Tanggamus, diusulkan menjadi prioritas dalam pembangunan HRES di Provinsi Lampung.

**Kata Kunci :** HRES, Pemilihan Lokasi, GIS, MCDM, TOPSIS, SAW

## ABSTRACT

*The use of fossil fuels for electricity generation has a negative impact on the environment and causes its availability to become increasingly scarce. This has encouraged several countries to switch to renewable energy as a source of electricity generation. In recent years, Hybrid Renewable Energy Systems (HRES), especially solar and wind power, have been widely considered because they have great potential in the energy transition towards environmentally friendly energy. The first and most important step to expand the use of electricity from HRES is location determination. Comparison of two Multi-Criteria Decision Making (MCDM) methods, namely Technique for Order of Preference by Similarity to Ideal Solution (TOPSIS) and Simple Additive Weighting (SAW), both of which are integrated with the Geographic Information System (GIS) used for making HRES location decisions. Nine criteria were selected and the climate and location aspects were the aspects most taken into account by researchers through international journals. The TOPSIS-GIS method obtained results that Tamansari Village, Pugung District, Tanggamus Regency (A3) was selected as the most optimal alternative for the HRES location in Lampung Province with a closeness value to the ideal solution of 0.62775. Likewise, with the SAW-GIS method, alternative A3 was selected as the most optimal alternative for the HRES location in Lampung Province with a value of 0.73369. With this MCDM approach, the best location for HRES has been determined, and Tamansari Village, Pugung District, Tanggamus Regency, is proposed to be a priority in developing HRES in Lampung Province.*

**Keywords :** *HRES, Site Selection, GIS, TOPSIS, SAW*



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