PENGEMBANGAN MODEL *MULTI-CRITERIA DECISION MAKING* UNTUK PENENTUAN LOKASI PLTN DENGAN METODE *FUZZY*-AHP DAN *FUZZY*-VIKOR DITINJAU DARI ASPEK SOSIAL EKONOMI

SKRIPSI

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ABSTRAK

Proses penentuan lokasi Pembangkit Listrik Tenaga Nuklir (PLTN) di Indonesia merupakan keputusan penting yang memiliki dampak signifikan terhadap ekonomi operasional pembangkit dan pembangunan berkelanjutan di wilayah tersebut. Dalam penelitian ini, dilakukan penggunaan dua algoritma, yaitu *Fuzzy*-AHP (*Analytic Hierarchy Process*) dan *Fuzzy*-VIKOR (*Vlse Kriterijumska Optimizacija I Kompromisno Resenje*), untuk memprioritaskan kriteria dan mengevaluasi kelayakan dua lokasi PLTN di Indonesia. Tujuan utama dari studi ini adalah untuk menentukan lokasi terbaik dalam pembangunan PLTN di Indonesia dehearngan mempertimbangkan 10 aspek sosial ekonomi, seperti *transmission network* (EC1), *operating cost* (EC2), *economy impact* (EC3), *security* (SO1), *transportation network* (SO2), *legal consideration* (SO3), *impact of tourism* (SO4), *land ownership* (SO5), *historical places* (SO6), dan *public acceptance* (SO7). Hasil pembobotan kriteria menunjukkan bahwa *security* (SO1), *transmission network* (EC1), dan *transportation network* (SO2) menjadi prioritas tertinggi di antara 10 kriteria yang telah dianalisis secara mendalam. Berdasarkan prioritas tersebut, Provinsi Kalimantan Barat menjadi lokasi yang paling layak untuk pendirian PLTN di Indonesia dengan indeks VIKOR sebesar 0.3599, sementara Provinsi Kalimantan Timur mendapatkan nilai indeks VIKOR sebesar 0.3953 dan menempati peringkat kedua. Pendekatan inovatif yang digunakan dalam penelitian ini, yaitu Metode *Multi-Criteria Decision Making* (MCDM) berbasis *Fuzzy*-AHP dan *Fuzzy*-VIKOR, memberikan fleksibilitas dan praktisitas dalam pengambilan keputusan serta memberikan panduan yang berharga dalam pemilihan lokasi PLTN di Indonesia. Dengan demikian, studi ini memberikan kontribusi penting dalam menentukan lokasi yang tepat untuk pembangunan PLTN di Indonesia dengan mempertimbangkan aspek sosial ekonomi yang relevan.

Kata Kunci : Pemilihan Lokasi, Pembangkit Listrik Tenaga Nuklir, *Fuzzy*-AHP, *Fuzzy*-VIKOR

ABSTRACT

The process of determining the location of a Nuclear Power Plant (NPP) in Indonesia is an important decision that has a significant impact on the operational economy of power plants and sustainable development in the region. In this study, two algorithms, namely Fuzzy-AHP (Analytic Hierarchy Process) and VIKOR (Vlse Kriterijumska Optimizacija I Kompromisno Resenje), were used to prioritize criteria and evaluate the validity of two PLTN locations in Indonesia. The main objective of this study is to determine the best location for the development of PLTN in Indonesia by considering 10 socio-economic aspects, such as transmission network (EC1), operating cost (EC2), economy impact (EC3), security (SO1), transportation network (SO2), legal consideration (SO3), impact of tourism (SO4), land ownership (SO5), historical places (SO6), and public acceptance (SO7). Security (SO1), transmission network (EC1), and transportation network (SO2) are the highest priorities among the 10 criteria that have been analyzed in depth. Based on these priorities, West Kalimantan became the most eligible location for the establishment of PLTN in Indonesia with a VIKOR index of 0.3599, while East Kalimantan province earned a VIKOR index of 0.3953 and ranked second. The innovative approach used in this research, namely the Multi-Criteria Decision Making Method (MCDM) based on Fuzzy-AHP and Fuzzy-VIKOR, provides flexibility and practicality in decision making as well as valuable guidance in the selection of PLTN locations in Indonesia. Thus, the study provides an important contribution to determining the correct location for the development of PLTN in Indonesia by considering relevant socio economic aspects.

Keywords : *Site Selection, Nuclear Power Plant, Fuzzy-AHP, Fuzzy-VIKOR*

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