SITE SUITABILITY ANALYSIS FOR WIND ENERGY FARM IN SABAH, MALAYSIA

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ABSTRACT

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This paper provides an analysis on suitable location for wind energy farm in Sabah. Electricity is critical to economic progress and human well-being, but its primary generation from fossil fuels creates serious environmental and supply security concerns. This study solves these problems by focusing on renewable wind energy, which provides a safer and more sustainable option.A detailed analysis of technical, environmental, social, and geographical factors is important for the choice of wind farm sites, which is vital for long-term investment in wind energy era. Geographic Information Systems (GIS) and a Multi-criteria Decision-making (MCDM) model are used in this study to determine the exceptional places for wind turbines in Sabah, Malaysia. Land utilization, wind velocity, terrain, proximity to power lines, and environmental restrictions are all vital elements to consider. Digital Elevation Models (DEM), local wind measurements, geological statistics, and other statistics will all be used in this research. The motive of the task is to perceive appropriate requirements for a wind farm located in Sabah, locate feasible locations with the use of ArcGIS Pro, and provide maps of suitability for wind electricity farms. The effects will assist Malaysia's renewable strength aims and sustainable strength development.

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INTRODUCTION

1.1 Background of Study

Sabah's geographical and climatic features make it a prime location for wind energy development. Sabah is a Malaysian province located in the north of Borneo Island, rich in natural resources. Wind energy is becoming an increasingly important renewable resource as the world moves towards more sustainable energy sources.

The investigation of wind energy in Sabah is important because of Malaysia's goal to reduce carbon emissions and foster sustainable development. Nevertheless, it is important to address barriers including accurate assessment of wind resources, ecological and societal consequences, and technological aspects which are complicated. Furthermore, the limited renewable energy infrastructure in Sabah requires strategic planning for the successful construction of wind farms, making sophisticated approaches such as GIS and MCA indispensable to find the best locations and optimize the advantages of wind energy in the area.

This study revolves around the need for an effective methodology to select suitable locations for wind farms using Geographic Information Systems (GIS) and Multi-Criteria Analysis (MCA). This research aims to address the challenge of identifying optimal sites for wind energy development by considering various criteria such as spatial, environmental, and technical factors. The overarching goal is to improve decision-making processes in wind farm location selection, ultimately contributing to the advancement of sustainable energy solutions.