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Multi-Criteria Decision Making for Site Suitability of a Solar Farms

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The global electricity consumption is increasing at a faster rate than total global power production. Non-renewable sources contributed more than 63.3% of global electricity production in 2020, and such a high reliance on non-renewable sources could lead to electricity shortages and environmental issues. This alarming situation is on the doorstep as various countries in the world are facing electricity crises. Solar energy can be an alternative to tackle this problem and to achieve the Sustainable Development Goal (SDG) of affordable and clean energy. There are several environmental factors that affect the efficiency of solar panel. Thus, based on the nature and working principle of photovoltaic cell, there is a need to prioritise these factors to locate suitable locations to increase the efficiency of both transmission and generation. Solar panel being expensive capital component, meticulous planning of such projects is necessary as it has long payback period, substantial investment, and relatively lower returns on investment. This study emphasises on two components, first the method of finding a suitable location with several required parameters through geospatial data analysis and the second being financial feasibility by identifying suitable locations of execution and maintenance costs that will be as minimal as possible without compromising the efficient solar locations. Higher efficiency and lower cost locations will together increase sustainability and affordability that contribute to achieving the SDG of affordable and clean energy.