

Title: Optimal site selection for the solar-wind hybrid renewable energy systems in Bangladesh using an integrated GIS-based BWM-fuzzy logic method(Article)

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Abstract

Solar-Wind Hybrid Renewable Energy Systems (SWHRESs) provide more reliable and efficient power than single systems and are, therefore, regarded as a promising tool for achieving SDG 7. However, the performance of SWHRESs in large-scale implementations is highly subject to the site selection method, which is subsequently crucial to achieving the goals of the transition from fossil fuels and climate change mitigation. To address this issue, this paper, based on a case study in Bangladesh, proposes a GIS-based BWM-Fuzzy Logic Method to select optimal sites for SWHRESs. The results show that SWHRESs are preferable to wind and solar systems alone. Totals of 11% and 25% of the area were suitable and moderately suitable, respectively, for SWHRESs, and the most suitable area for installation was Chittagong. The most influential criteria are solar irradiation, elevation, distance to rivers and waterbodies. The results of three sets of sensitivity analysis have demonstrated the robustness of the proposed method, and the comparative study has further shown that the proposed method performs better than methods proposed in previous studies. Hence, this study has provided a powerful tool for supporting decision-making regarding SWHRESs, thus offering a useful tool for achieving SDG 7. © 2023 Elsevier Ltd

Author keywords

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