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| Title | An integrated fuzzy optimal location selection model for setting up floating solar photovoltaic plant: Implications for energy sustainability in Bangladesh |
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| Abstract |
| Floating Solar Photovoltaic (FSPV) plants have emerged as a promising solution, harnessing solar energy while utilizing water bodies effectively, especially for emerging economy countries with limited land resources like Bangladesh. However, selecting an optimal location for such a solar plant requires a comprehensive evaluation of multiple criteria. This research, therefore, proposes a multi-criteria decision-making framework that integrates the Fuzzy Best Wort Method (F-BWM) and Fuzzy Combined Compromise Solution (F-CoCoSo) method to determine the optimal location for establishing a floating solar photovoltaic plant in Bangladesh. Through literature review and expert validation, ten key criteria were identified for suitable site selection for FSPV. Relative weights of the identified evaluation criteria were calculated using the F-BWM method. Following that, the F-CoCoSo approach was employed to rank the eight alternative potential sites in Bangladesh based on the F-BWM weights. The F-BWM result indicates that solar irradiance, terrain elevation, and conflicts over water access are the three most significant factors in selecting the site for FSPV installation. F-CoCoSo results identified the Kaptai Lake, located in southeastern Bangladesh, and Barapukuria Coal Mine's Lake, located in northwestern Bangladesh, as the two most preferable sites for installing FSPV plants. The research findings are expected to help academicians, policymakers, energy planners, and investors by offering a nuanced understanding of the significance of various technical, environmental, and social criteria for FSPV installation projects. Additionally, it offers a robust framework for site selection that enhances the efficiency, sustainability, and feasibility of FSPV projects in Bangladesh. |
| Sustainable Development Goal(s) (SDG) |
| Example: Goal 9: Industry, Innovation and Infrastructure |

Goal 3: Good health and well-being

Goal 6: Clean water and sanitation

Goal 7: Affordable and clean energy

Goal 9: Industry, Innovation, Technology and Infrastructure

Goal 11: Sustainable cities and communities

Goal 12: Responsible consumption and production

Goal 13: Climate action

Goal 14: Life below water

Goal 17: Partnerships for the goals