



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 Worst 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 Barapaisaria 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.

1. Introduction

The global energy market started to shrink since 2021 due to rapid economic recovery following the COVID-19 pandemic. However, the situation intensified significantly into a severe worldwide energy crisis due to the conflict between Russia and Ukraine in recent years. This polarization has put pressure on energy imports in different parts of the world, particularly in Bangladesh and other countries that are rapidly industrializing and experiencing economic growth [1]. In order to achieve the objective of the Paris Agreement, which is to keep the

increase in global temperature to 1.5 °C over pre-industrial levels by the year 2100, a comprehensive transformation in the global energy production and consumption methods is necessary [2]. For Bangladesh to align with this target, it is crucial to transition from the conventional dependence on fossil fuels to sustainable renewable energy sources. Within this context, the implementation of floating solar photovoltaic (FSPV) technology emerges as a feasible option for sustainable energy generation in Bangladesh, aligning with the Sustainable Development Goals (SDGs). In recent times, Bangladesh has been putting efforts into increasing the installed capacity in power generation, but mostly, these

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Integrated Rfid Model For Optimal Selection Of Drilling

Jin-Ying Zhang



Integrated Rfid Model For Optimal Selection Of Drilling:

Systems Approach and Quantitative Decision Tools for Technology Selection in Environmentally Friendly

Drilling Ok Y. Yu, 2010 One of the petroleum industry's goals is to reduce the environmental impact of oil and gas operations in environmentally sensitive areas. To achieve this, a number of Environmentally Friendly Drilling (EFD) technologies have been developed to varying degrees. For example, the use of an elevated platform as an alternative to the gravel pad is less intrusive and leads to a more environmentally friendly approach to drilling operations. Elevated drilling platforms will require the use of piles. Another alternative to the gravel pad is the use of composite mats. Since the demand for low impact technologies for drill site construction has rapidly increased, the parametric study for the feasibility of using pile foundations and composite mats is conducted in this research. Even though a number of EFD technologies have already been developed to varying degrees, few have been integrated into a field demonstrable drilling system, i.e., combination of technologies compatible with ecologically sensitive areas. In general, it is difficult to select the best combination of EFD technologies for a given site because there are many possible combinations and many different evaluation criteria. The proposed technology evaluation method is based on a systems analysis that can be used for integrating current and new EFD technologies into an optimal EFD system. An optimization scheme is suggested based on a combination of multi-attribute utility theory and exhaustively enumerating all possible technology combinations to provide a quantitative rationale and suggest the best set of systems according to a set of criteria with the relative importance of the different criteria defined by the decision maker. In this research, the sensitivity of the optimal solution to the weight factors and the effects of the uncertainty of input scores are also discussed using a case study. An application of the proposed approach is described by conducting a case study in Green Lake at McFaddin, TX. The main purpose of this case study is to test the proposed technology evaluation protocol in a real site and then to refine the protocol. This research describes the results of the case study, which provided a more logical and comprehensive approach that maximized the economic and environmental goals of both the landowner and the oil company leaseholder.

Unveiling the Magic of Words: A Report on "**Integrated Rfid Model For Optimal Selection Of Drilling**"

In a world defined by information and interconnectivity, the enchanting power of words has acquired unparalleled significance. Their ability to kindle emotions, provoke contemplation, and ignite transformative change is actually awe-inspiring. Enter the realm of "**Integrated Rfid Model For Optimal Selection Of Drilling**," a mesmerizing literary masterpiece penned by way of a distinguished author, guiding readers on a profound journey to unravel the secrets and potential hidden within every word. In this critique, we shall delve into the book's central themes, examine its distinctive writing style, and assess its profound affect on the souls of its readers.

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