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An Assessment on Solar Energy Exploitation by MOORA Method

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Abstract. *Solar energy implementation of the solar energy to create environmentally friendly electricity and heat. It is a renewable and sustainable energy source with many benefits. One of the main approaches to harnessing solar energy is by photovoltaic cells (PV), commonly referred to as solar panels. These panels are made of silicon cells that use stimulating electrons to convert sunlight directly into electricity. Harnessing solar energy contributes to the fight against climate change by reducing our dependence on fossil fuels and preventing emissions of greenhouse gases and air pollutants. Additionally, solar panels require minimal maintenance and can last for decades. Solar energy is used in a big range of fields, including residential and commercial buildings and large photovoltaic parks. We provide distributed energy solutions that allow individuals or in communities to produce own electricity itself and minimize their dependence on traditional power grids. In addition, solar energy can be seamlessly integrated with existing infrastructure such as roofs and solar powered street lights to optimize space utilization. Governments and businesses are increasing their investment in solar energy utilization to ensure its long-term viability. Declining solar panel costs and technological advances have made solar energy more affordable and accessible. Many countries are promoting solar power systems through measures such as tax credits and feed-in tariffs. In summary, the utilization of solar energy as an important role in the transition to sustainable and clean energy in the future. By mobilize solar energy, we can reduce carbon emissions, fight climate change, and provide future generations with a reliable and environmentally friendly source of electricity. Research Significance: Research into the utilize of solar energy is of extreme significate as it will advance the efficiency, affordability, and scalability of this renewable energy source. The research allows scientists and engineers to focus on developing more efficient solar panels and solar cells that maximize the amount of electricity generated by the sun. Research into new materials and technologies such as perovskite solar cells and thin film solar cells offers opportunities to improve light absorption and reduce costs. In addition, research focuses on energy storage solutions and addresses the 'intermittent natural' of solar energy through the development of efficient and cost-effective storage systems. The combination of solar energy into existing infrastructures and grids is another important aspect to ensure homogeneous and area-wide distribution. Overall, solar energy research will accelerate the transition to renewable energy, mitigate climatic changes and promote the utilization of the sun as a reliable, affordable, and accessible energy solution for a sustainable future. It has great potential for energy production. Methodology: MOORA METHOD: It (Multi-Objective Optimization Based in the Ratio Analysis) is a decision support technique that evaluates and ranks alternatives based on various criteria and goals. It offers a systematic approach to making informed decisions in complex situations. MOORA evaluates each alternative, assigns performance scores to the criteria, normalizes the scores, and generates weighted criteria scores. The relationship between performance and weighted ratings determines the overall performance rating and allows for an alternative classification. The method considers subjective assessments and the different weighting of the criteria and pursues several goals at the same time. MOORA provides decision makers with a structured framework to analyse and prioritize alternatives, facilitating effective and efficient decision making. It is used in project management, investment analysis, and resource allocation, helping to solve complex decision-making problems. In summary, this MOOR approach allows decision makers to evaluate and rank alternatives against multiple criteria and objectives. By considering different factors and considering different weightings, MOORA supports well-founded decision-making in different areas. Alternate Parameters: "Solar-Energy Exploitation 1"," Solar-Energy Exploitation 2", "Solar-Energy Exploitation 3", "Solar-Energy Exploitation 4", "Solar-Energy Exploitation 5". Evaluation Parameters: Permeation Characteristics, Geometrical Properties, Climatological Characteristics, Systems Characteristics. Result: Solar Energy*

Exploitation 4 got the first rank in the Ranking of Solar Energy Exploitation but the Solar Energy Exploitation 3 got the last rank in the Ranking of solar-energy exploitation. Conclusion: In this paper the "Solar-Energy Exploitation 4" got the first rank in the Ranking of Solar Energy Exploitation but the "Solar-Energy Exploitation 3" got the last rank in the Ranking of solar exploitation. It is all based on their Benefit and Non-Benefit parameters

Keywords*: Properties, Solar Energy Exploitation*

1. INTRODUCTION

The 'sun' is a critical and has abundant of renewable energy because of its source for the planet, especially in the form of solar energy. Advances in technology have made it possible to harness solar energy for power generation. The development of innovative solar energy technologies is recognized as a key solution to meeting the growing global energy demand. The photovoltaic technology industry is experiencing rapid growth. Still, solar cells face several technical challenges, such as problems related to low efficiency, system imbalance (BOS), and economic restraint [1]. Researchers strive to design advanced PV systems with high efficiency and low development costs, focusing on enhancing charge movement, photovoltaic composites, and solar radiation absorption for optimal solar energy harvesting [2]. Extensive research has been conducted over the past decades on energy efficient passive designs and structures. These approaches aim to improve the building's thermal energy storage capacity, increase thermal mass, improve passive insulation, and minimize heat loss [3]. Buildings consume a significant portion of the earth's energy and contribute to environmental pollution. Energy retrofits are essential to reduce environmental pollution. Government subsidies and regulations drive energy efficiency in buildings around the world [4]. Research is being conducted on utilizing solar energy to power reverse osmosis (RO) seawater desalination plants. The focus is on designing it into hybrid solar-assisted steam cycle that can generate the necessary works to drive the 'high-pressure' pump in the RO plant. This investigation addresses two specific concerns and analyses their implications [5]. Significant use of fossil fuels in various human activities has resulted in undesirable consequences, including unprecedented levels of atmospheric and environmental pollution in recorded human history. These effects manifest in the form of "global warming, greenhouse effect, climate change, depletion of ozone layer and occurrence of acid rain." These issues are frequently discussed and documented in the literature [6]. Solar energy offers an alternative solution for powering various desalination processes. Solar energy can heat brine, enhance filtration, power compressors, and directly desalinate seawater, providing versatile solutions for clean water scarcity. [7]. A major direction of technological progress is focused on the integration of green energy practices. This is a perfect example that is the use of photovoltaic panels on the roofs of electric vehicles. Combining solar panels with advanced control systems will make it possible to extend the range of these vehicles [8]. Even in ancient times, before fire was invented, people used solar energy. It was used for drying, cooking, draining materials such as salt and bricks, and for many other purposes. Animal power and human power were used first, then other energy sources such as fuels, fossil fuels, hydroelectric power, and nuclear power. Solar energy is plentiful but often overlooked as a viable alternative to these traditional forms of energy production [9]. Instead of using thermal energy from sea water or power plant effluent, solar energy can be utilized for LNG regasification, preserving its physical exergy [10]. The sun holds the key to our future energy needs, as it provides abundant, clean, and secure energy that surpasses our annual consumption and is free from pollution and geopolitical limitations [11]. The power sector continues to evolve, with solar energy technology emerging as a significant and promising contributor in the rapidly expanding global renewable energy market [12]. Solar thermal integration offers the opportunity to generate both heat and electricity by combining photovoltaic (PV) and related components into a hyper state unit. The less-cost design of these cells can attract a great deal of interest and attention from researchers in this field [13]. As the proportion of Renewable Energy Sources (RES) which is an energy consumption, there is a need to expand the utilization of renewables not just in the form of electricity but also in the realm of thermal energy [14]. Compared to conventional energy sources, solar energy technology (SET) offers clear advantages to the environment and thus makes a valuable contribution to sustainable development. Apart from being rich in inexhaustible natural resources, its main advantage is its ability to significantly reduce CO2 emissions. In addition, SET emits no air pollutants and produces no waste, further enhancing environmental benefits [15].

2. VIKOR METHOD

A multi-objective optimization, where called as multi-criteria or multi-attribute optimization, aims in optimizing several conflicting attributes (or) objectives simultaneously under certain boundary conditions. Such optimization problems can arise in a variety of fields including "product and process design, finance, aerospace design, oil and gas, manufacturing, automotive design, and many others". Achieving optimal results in these areas requires a skilful use of trade-offs and compromises. The MOOR method allows decision makers to evaluate and rank alternatives against multiple criteria and objectives. By considering different factors and considering different weightings, MOORA supports well-founded decision-making in different areas [16]. In the real-time of decision making, manufacturing environment is challenging due to the diversity of interests and values of different stakeholders. In such decision problems, goals or measurable criteria are necessary and the performance of each alternative can be evaluated accordingly. There are conflicting goals, some of which are beneficial and prioritize maximum values, while others are considered irrelevant and require at least a certain scaling value. Balancing these competing criteria in decision making presents a significant problem [17]. The MOORA method optimizes welding parameters by considering multiple objectives. It simplifies decision-making, enabling the selection of the most suitable option while eliminating poor choices. It offers an alternative to existing selection procedures, enhancing the decision-making process [18]. In MOORA, overall performance is determined by comparing the sum of normalized performances for favorable and unfavorable criteria, evaluating the effectiveness of alternatives considering both factors [19]. The PPA selection process uses the MOORA system and merit-based criteria to choose recipients. My research focused on implementing a decision support system that effectively selects deserving students for scholarships using MOORA [20]. Numerical tests confirm MOORA's efficiency in computation and problem definition. This study explores industrial engineering students' career choices and the criteria influencing them, filling a research gap in this area [21]. Integrating MOORA and Taguchi methods converts multi-response optimization problems into single-answer questions, minimizing mathematical calculations and saving time and costs [22]. The pricing system approach normalizes output data, resulting in a dimensionless matrix for fair comparison of all elements. This normalization process enables easy comparison within the result matrix [23]. Determining the best supply chain strategy is critical for companies to improve efficiency and reduce costs. A supply chain consists of interconnected organizations that create value through various processes and ultimately deliver products and services that satisfy customers. The goal is to maximize the value created and match it with supply chain profitability [24]. As technology and industry progress, new challenges arise in health, safety, and the environment [25]. Solar Energy Exploitation 1, 2, 3, 4, 5: Solar energy utilization datasets consist of valuable information pertaining to solar radiation, weather patterns, panel efficiency, energy generation, and other pertinent variables. These datasets enable researchers and professionals to thoroughly analyses solar energy systems and make well-informed decisions regarding sustainable energy solutions. By examining the data, insights that optimize the performance & effectiveness of ‘solar energy systems’, contributing to a greener and more sustainable future. Permeation Characteristics: Exchange properties study how one substance allows other substances to interact. The goal is to understand factors such as pore size, surface properties, and molecular structure to design materials with desirable permeability. This knowledge is important for industries that need to control material flow to improve process and product quality. Geometrical Properties: Geometrical properties involve the shape, size, and dimensions of an object. They include parameters like length, width, area, and angles. Understanding these properties is crucial for modelling, analysis, and design in various fields. Climatological Characteristics: Climatological characteristics study long-term weather patterns and conditions in an area, including temperature, precipitation, humidity, wind, and atmospheric pressure. They provide insights for agriculture, infrastructure planning, and environmental management. Systems Characteristics: System characteristics include system-specific attributes and properties. They reveal its components, structures, interactions, behaviors, and functions. Analyzing these characteristics provides a comprehensive understanding of system behavior and helps optimize performance. Guide decisions to improve efficiency and effectiveness in managing complex systems.

3. RESULT AND DISCUSSION

TABLE 1. Solar Energy Exploitation

	Permeation Characteristics	Geometrical Properties	Climatological Characteristics	Systems Characteristics
Solar Energy Exploitation 1	46.36	150.63	35.63	48.96
Solar Energy Exploitation 2	36.45	142.97	33.69	36.45
Solar Energy Exploitation 3	30.15	130.46	38.65	43.78
Solar Energy Exploitation 4	37.63	145.46	40.32	35.63
Solar Energy Exploitation 5	35.63	186.41	46.56	33.48

Table 1 contains the Dataset of “Solar-Energy Exploitation 1”, “Solar-Energy Exploitation 2”, “Solar-Energy Exploitation 3”, “Solar-Energy Exploitation 4”, “Solar-Energy Exploitation 5”; Permeation Characteristics, Geometrical Properties, Climatological Characteristics, Systems Characteristics.

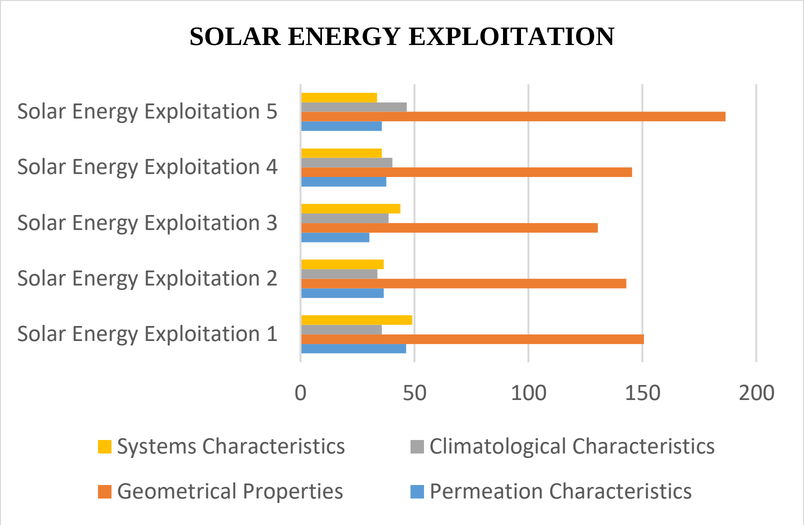

FIGURE 1. Values of "Solar Energy Exploitation"

Figure 1 implies that the statistics of individual solar Energy Exploitation and from this we understand that the Solar energy Exploitation 4 has the high benefit and the lowest non-benefit of all other solar Energy Exploitations.

TABLE 2. Normalized Data for Solar Energy Exploitation

NORMALIZED DATA				
Solar Energy Exploitation 1	0.551265	0.442156	0.406256	0.546271
Solar Energy Exploitation 2	0.433426	0.419671	0.384136	0.406691
Solar Energy Exploitation 3	0.358512	0.38295	0.44069	0.488476
Solar Energy Exploitation 4	0.447457	0.426981	0.459732	0.397542
Solar Energy Exploitation 5	0.423675	0.547184	0.530881	0.373553

Table 2 shows the Normalized Data for "Solar-Energy Exploitation 1", "Solar-Energy Exploitation 2", "Solar-Energy Exploitation 3", "Solar-Energy Exploitation 4", "Solar-Energy Exploitation 5"; Permeation Characteristics, Geometrical Properties, Climatological Characteristics, Systems Characteristics.

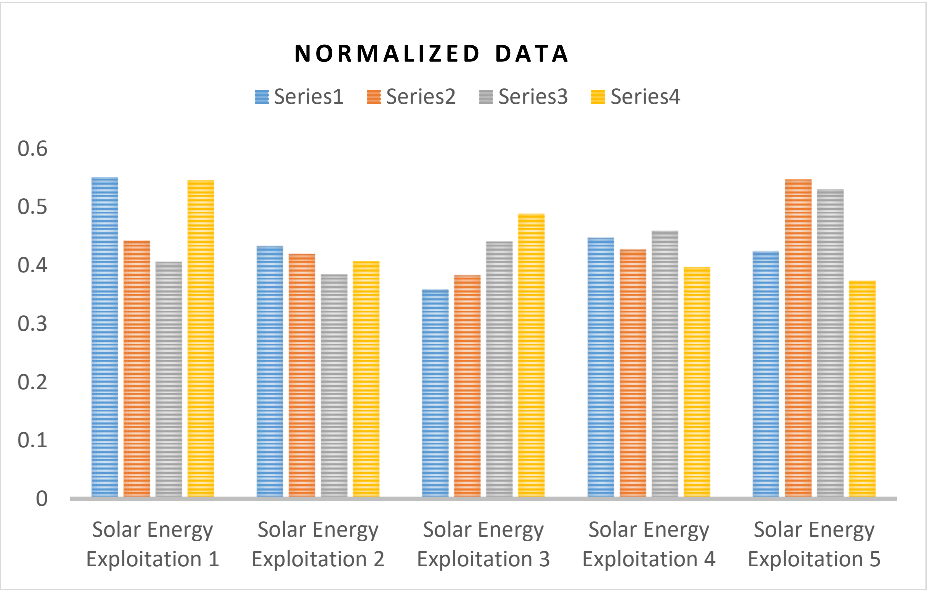

FIGURE 2. Normalized data for Automotive brake disc material selection

Figure 2 shows the Normalized data for MOORA Method Alternative: "Solar-Energy Exploitation 1", "Solar-Energy Exploitation 2", "Solar-Energy Exploitation 3", "Solar Energy Exploitation-4", "Solar-Energy Exploitation 5"; Permeation Characteristics, Geometrical Properties, Climatological Characteristics, Systems Characteristics (i.e.) which shows which has better advantages.

TABLE 3. Weightages of the materials

WEIGHT				
Solar Energy Exploitation 1	0.25	0.25	0.25	0.25
Solar Energy Exploitation 2	0.25	0.25	0.25	0.25
Solar Energy Exploitation 3	0.25	0.25	0.25	0.25
Solar Energy Exploitation 4	0.25	0.25	0.25	0.25
Solar Energy Exploitation 5	0.25	0.25	0.25	0.25

Table 3 provides the weights utilized for the analysis, where equal weights are assigned to all parameters

TABLE 4. Weighted normalized decision matrix

WEIGHTED - NORMALIZED DECISION MATRIX				
Solar Energy Exploitation 1	0.137816	0.110539	0.101564	0.136568
Solar Energy Exploitation 2	0.108356	0.104918	0.096034	0.101673
Solar Energy Exploitation 3	0.089628	0.095737	0.110173	0.122119
Solar Energy Exploitation 4	0.111864	0.106745	0.114933	0.099385
Solar Energy Exploitation 5	0.105919	0.136796	0.13272	0.093388

Table 4 for MOORA Alternative: "Solar-Energy Exploitation 1", "Solar-Energy Exploitation 2", "Solar-Energy Exploitation 3", "Solar-Energy Exploitation 4", "Solar-Energy Exploitation 5"; Permeation Characteristics, Geometrical Properties, Climatological Characteristics, Systems Characteristics. It shows which is the comparison between others.

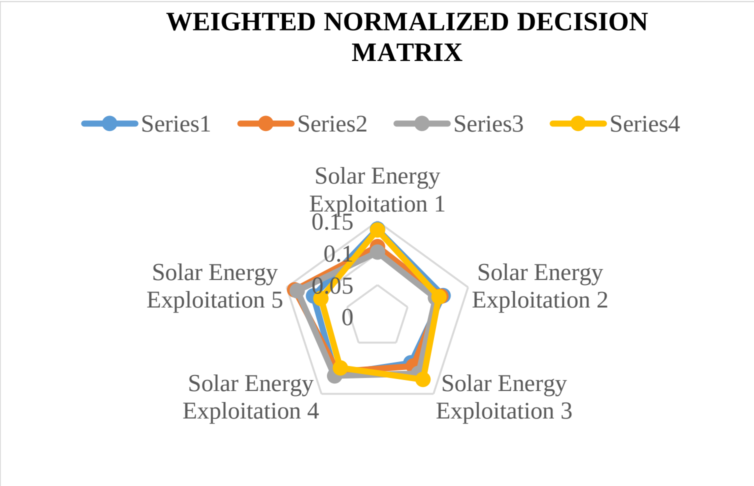

FIGURE 4. Weighted Normalized Decision Matrix for solar Energy Exploitation

Figure 4 shows that Weighted Normalized Decision Matrix for "Solar-Energy Exploitation 1", "Solar-Energy Exploitation 2", "Solar-Energy Exploitation 3", "Solar-Energy Exploitation 4", "Solar-Energy Exploitation 5"; Permeation Characteristics, Geometrical Properties, Climatological Characteristics, Systems Characteristics.

TABLE 5. Assessment value of the Solar Energy Exploitation

ASSESSMENT VALUE	
Solar-Energy Exploitation 1	0.0102
Solar-Energy Exploitation 2	0.0155
Solar-Energy Exploitation 3	-0.0469
Solar-Energy Exploitation 4	0.0042
Solar-Energy Exploitation 5	0.0166

Table 5. Assessment value of the "Solar Energy Exploitation" for "Solar-Energy Exploitation 1", "Solar-Energy Exploitation 2", "Solar-Energy Exploitation 3", "Solar-Energy Exploitation 4", "Solar -Energy Exploitation 5"; Permeation Characteristics, Geometrical Properties, Climatological Characteristics, Systems Characteristics. It shows which is the comparison between others.

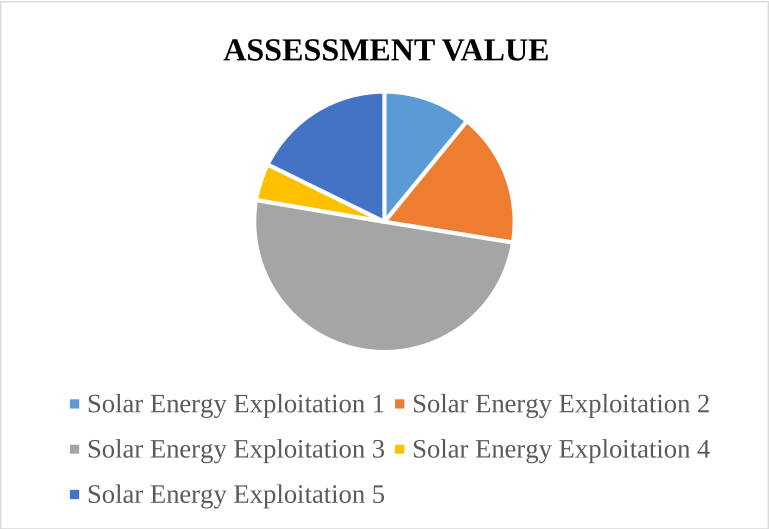

FIGURE 5. Assessment value for solar Energy Exploitation

Figure 4 shows the Assessment value for "Solar-Energy Exploitation1", "Solar-Energy Exploitation 2", "Solar-Energy Exploitation 2", "Solar-Energy Exploitation 3", "Solar-Energy Exploitation-4", "Solar-Energy Exploitation 5"; Permeation Characteristics, Geometrical Properties, Climatological Characteristics, Systems Characteristics.

Table 6. Rank of the Solar Exploitation

RANK	
Solar-Energy Exploitation - 1	3
Solar-Energy Exploitation - 2	2
Solar-Energy Exploitation - 3	5
Solar-Energy Exploitation - 4	4
Solar-Energy Exploitation - 5	1

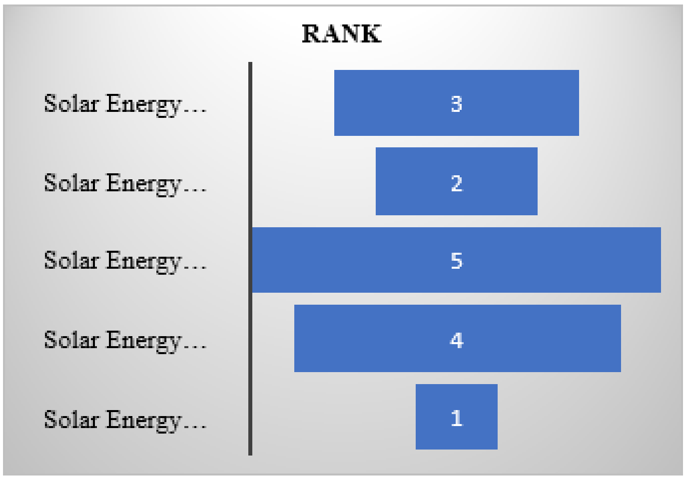

FIGURE 6. Rank of these solar Energy Exploitation

Figure 6 shows that the Rank of these "Solar-Energy Exploitation 1", "Solar-Energy Exploitation 2", "Solar-Energy Exploitation 3", "Solar-Energy Exploitation 4", "Solar-Energy Exploitation 5"; Permeation Characteristics, Geometrical Properties, Climatological Characteristics, Systems Characteristics. Here "the Solar-Energy Exploitation 5" is placed first and the Solar Energy Exploitation 3 placed at last. It is best to use "Solar-Energy Exploitation 5" everywhere.

4. CONCLUSION

Solar energy implementation of the solar energy to create environmentally friendly electricity and heat. It is a renewable and sustainable energy source with many benefits. One of the main approaches to harnessing solar energy is by photovoltaic cells (PV), commonly referred to as solar panels. solar energy research will accelerate the transition to renewable energy, mitigate climatic changes and promote the utilization of the sun as a reliable, affordable, and accessible energy solution for a sustainable future. It has great potential for energy production. Solar energy offers a sustainable and environmentally friendly solution to meet a variety of challenges such as energy demand, water scarcity, pollution, and dependence on fossil fuels. Its enormous potential and current developments are paving a promising path towards a cleaner and more sustainable future. Thus, from the dataset we can conclude that the “Solar-Energy Exploitation 5” is placed first and the Solar Energy Exploitation 3 placed at last. It is best to use “Solar-Energy Exploitation 5” everywhere. By using ‘MOORA’ approach, we got the result for the “Solar-Energy Exploitation.

REFERENCES

[1]. Kabir, Ehsanul, Pawan Kumar, Sandeep Kumar, Adedeji A. Adelodun, and Ki-Hyun Kim. "Solar energy: Potential and future prospects." Renewable and Sustainable Energy Reviews 82 (2018): 894-900.

[2]. Hajji, Mohammed, H. Labrim, M. Benaissa, A. Laazizi, H. Ez-Zahraouy, E. Ntsoenzok, J. Meot, and A. Benyoussef. "Photovoltaic and thermoelectric indirect coupling for maximum solar energy exploitation." Energy conversion and management 136 (2017): 184-191.

[3]. Michailidis, Iakovos T., Simone Baldi, Martin F. Pichler, Elias B. Kosmatopoulos, and Juan R. Santiago. "Proactive control for solar energy exploitation: A german high-inertia building case study." Applied Energy 155 (2015): 409-420.

[4]. Jindal, Mayank, Madan Mohan Tito Ayyalasomayajula, Dedeepya Sai Gondi, and Harish Mashetty. "Enhancing Federated Learning Evaluation: Exploring Instance-Level Insights with SQUARES in Image Classification Models." Journal of Electrical Systems 20, no. 7s (2024): 2516-2523.

[5]. Hemamalini, N., and M. Kavi Bharathi. "Prominence of Indianess in English Literature with Reference to Indian English Writers and Their Notable Works." *Elementary Education Online* 20, no. 5 (2021): 5568-5568.

[6]. Ascione, Fabrizio, Nicola Bianco, Gerardo Maria Mauro, Davide Ferdinando Napolitano, and Giuseppe Peter Vanoli. "Comprehensive analysis to drive the energy retrofit of a neighborhood by optimizing the solar energy exploitation–An Italian case study." Journal of Cleaner Production 314 (2021): 127998.

[7]. Voros, N. G., C. T. Kiranoudis, and Z. B. Maroulis. "Solar energy exploitation for reverse osmosis desalination plants." Desalination 115, no. 1 (1998): 83-101.

[8]. Şen, Zekai. "Solar energy in progress and future research trends." Progress in energy and combustion science 30, no. 4 (2004): 367-416.

[9]. Banat, Fawzi, R. Jumah, and M. Garaibeh. "Exploitation of solar energy collected by solar stills for desalination by membrane distillation." Renewable energy 25, no. 2 (2002): 293-305.

[10]. Sarigiannidis, A. G., P. E. Kakosimos, and A. G. Kladas. "Solar energy exploitation enhancing driving autonomy of electric vehicles." In MedPower 2014, pp. 1-5. IET, 2014.

[11]. Ciamberlini, C., F. Francini, G. Longobardi, M. Piattelli, and P. Sansoni. "Solar system for exploitation of the whole collected energy." Optics and Lasers in Engineering 39, no. 2 (2003): 233-246.

[12]. Bisio, G., and C. Pisoni. "Thermodynamic analysis of solar energy utilization combined with the exploitation of the LNG physical exergy." (1995): 333-335.

[13]. Ohunakin, Olayinka S., Muyiwa S. Adaramola, Olanrewaju M. Oyewola, and Richard O. Fagbenle. "Solar energy applications and development in Nigeria: Drivers and barriers." Renewable and Sustainable Energy Reviews 32 (2014): 294-301.

[14]. Sathiyaraj Chinnasamy, Chinnasami Sivaji, Vidhya Prasantha, M. Ramachandran,"Multi-Criteria Decision-Making Analysis of Information and Communication Technology Using VIKOR", R EST Journal on Advances in Mechanical Engineering, 3(2), June 2024, 10-14.

[15]. Narani, Sandeep Reddy, Madan Mohan Tito Ayyalasomayajula, and Sathishkumar Chintala. "Strategies For Migrating Large, Mission-Critical Database Workloads To The Cloud." Webology (ISSN: 1735-188X) 15, no. 1 (2018).

[16]. Ms B Sakthimala, Ms N Hemamalini, “FACETS OF GLOBALIZATION AND MULTICULTURALISM IN KIRAN DESAI’S THE INHERITANCE OF LOSS” Journal of Critical Reviews, 7(13), 2020, 3982-3983.

[17]. KUMAR, NEERAJ, MANORANJAN KUMAR MANOJ, and M. KALYAN PHANI. "Material Science Research India." (2018).

[18]. Yudaev, I. V., Yu V. Daus, A. V. Zharkov, and V. Ya Zharkov. "Private solar power plants of Ukraine of small capacity: features of exploitation and operating experience." Applied Solar Energy 56 (2020): 54-62.

[19]. Sansaniwal, Sunil Kumar, Vashimant Sharma, and Jyotirmay Mathur. "Energy and exergy analyses of various typical solar energy applications: A comprehensive review." Renewable and Sustainable Energy Reviews 82 (2018): 1576-1601.

[20]. Dixit, Varun, and Davinderjit Kaur. "A Systematic Review for Sustainable Software Development Practice and Paradigm." Journal of Computational Analysis and Applications (JoCAAA) 33, no. 06 (2024): 170-185

[21]. Manjula selvam, Vidhya Prasanth, M. Ramachandran, Ramya Sharama, "A Study on Economic Models of Animal Communication Methods" Journal on Innovations in Teaching and Learning, 3(2), June 2024, 13-19.

[22]. Carpaneto, E., P. Lazzeroni, and M. Repetto. "Optimal integration of solar energy in a district heating network." Renewable Energy 75 (2015): 714-721.

[23]. Tsoutsos, Theocharis, Niki Frantzeskaki, and Vassilis Gekas. "Environmental impacts from the solar energy technologies." Energy policy 33, no. 3 (2005): 289-296.

[24]. Chakraborty, Shankar. "Applications of the MOORA method for decision making in manufacturing environment." The International Journal of Advanced Manufacturing Technology 54 (2011): 1155-1166.

[25]. Karande, Prasad, and Shankar Chakraborty. "Application of multi-objective optimization on the basis of ratio analysis (MOORA) method for materials selection." Materials & Design 37 (2012): 317-324.

[26]. Gadakh, V. S., Vilas Baburao Shinde, and N. S. Khemnar. "Optimization of welding process parameters using MOORA method." The International Journal of Advanced Manufacturing Technology 69 (2013): 2031-2039.

[27]. Karande, Prasad, and Shankar Chakraborty. "A Fuzzy-MOORA approach for ERP system selection." Decision Science Letters 1, no. 1 (2012): 11-21.

[28]. Siregar, Victor Marudut Mulia, Mega Romauly Tampubolon, Eka Pratiwi Septania Parapat, Eve Ida Malau, and Debora Silvia Hutagalung. "Decision support system for selection technique using MOORA method." In IOP Conference Series: Materials Science and Engineering, vol. 1088, no. 1, p. 012022. IOP Publishing, 2021.

[29]. Ayyalasomayajula, Madan Mohan Tito, Sathishkumar Chintala, and Sandeep Reddy Narani. "INTELLIGENT SYSTEMS AND APPLICATIONS IN ENGINEERING."

[30]. Phani, Makkuva Kalyan. "Quantitative mapping of elastic properties in nickel and titanium base alloys at nanoscale using atomic force acoustic microscopy."

[31]. Sahoo, Santosh Kumar, Bellamkonda Saidulu, and D. Shyam Prasad. "Defective object classification using advanced optimization technique." *Materials Today: Proceedings* 38 (2021): 2695-2699.

[32]. Singh, Prabhjot, Varun Dixit, and Jaspreet Kaur. "Green healthcare for smart cities." In Green and Smart Technologies for Smart Cities, pp. 91-130. CRC Press, 2019.

[33]. Akkaya, Gökay, Betül Turanoğlu, and Sinan Öztaş. "An integrated fuzzy AHP and fuzzy MOORA approach to the problem of industrial engineering sector choosing." Expert Systems with Applications 42, no. 24 (2015): 9565-9573.

[34]. Ayyalasomayajula, Madan Mohan Tito, Santhosh Bussa, and Sailaja Ayyalasomayajula. "Forecasting Home Prices Employing Machine Learning Algorithms: XGBoost, Random Forest, and Linear Regression." ESP Journal of Engineering & Technology Advancements (ESP-JETA) 1, no. 1 (2021): 125-133.

[35]. Tansel İç, Yusuf, and Sebla Yıldırım. "MOORA-based Taguchi optimisation for improving product or process quality." International Journal of Production Research 51, no. 11 (2013): 3321-3341.

[36]. Attri, Rajesh, and Sandeep Grover. "Decision making over the production system life cycle: MOORA method." International Journal of System Assurance Engineering and Management 5 (2014): 320-328.

[37]. Dey, Balaram, Bipradas Bairagi, Bijan Sarkar, and Subir Sanyal. "A MOORA based fuzzy multi-criteria decision making approach for supply chain strategy selection." International Journal of Industrial Engineering Computations 3, no. 4 (2012): 649-662.

[38]. Ayyalasomayajula, Madan Mohan Tito, and Sailaja Ayyalasomayajula. "Support Vector Machines in Virtual Screening for Therapeutic Exploration Using Radial Basis Function (RBF) Kernel for Kinase Inhibitor Discovery."

[39]. Phani, M. Kalyan, Victor Pfahl, Chengfu Ma, Anish Kumar, W. Arnold, and K. Samwer. "Nonlinear Behavior of Contact Resonance Atomic Force Microscopy Due to Stick-Slip Phenomena." In *2018 IEEE International Ultrasonics Symposium (IUS)*, pp. 1-4. IEEE, 2018.

[40]. Prasad, Devulapalli Shyam, Srinivasa Rao Chanamallu, and Kodati Satya Prasad. "Mitigation of ocular artifacts for EEG signal using improved earth worm optimization-based neural network and lifting wavelet transform." *Computer Methods in Biomechanics and Biomedical Engineering* 24, no. 5 (2021): 551-578.

[41]. Dabbagh, Rahim, and Samuel Yousefi. "A hybrid decision-making approach based on FCM and MOORA for occupational health and safety risk analysis." Journal of safety research 71 (2019): 111-123.

[42]. Ayyalasomayajula, Madan Mohan Tito. "Metadata Enhanced Micro-Partitioned Bitmap Indexes for Managing Large-Scale Datasets." PhD diss., Aspen University, 2024.