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Integrating IT and Solar Energy: A New Era of Smart Agriculture

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Abstract

Agriculture is undergoing a transformative phase with the integration of solar energy, offering farmers sustainable, cost-effective, and efficient solutions to address critical challenges. This paper explores the convergence of Information Technology (IT) and solar energy in agriculture, focusing on the deployment of IT-driven solar technologies in the region of Maharashtra, India. The study highlights the role of solar-powered irrigation systems, automated climate control, and intelligent data analytics in optimizing farming practices. Advanced IT solutions, such as IoT-enabled sensors, AI-driven predictive analytics, and cloud-based monitoring systems, are examined for their potential to enhance agricultural efficiency and ensure sustainable energy utilization. Government initiatives and subsidy programs promoting solar energy adoption are also analyzed, along with a case study demonstrating the tangible benefits of IT-enabled solar solutions. The findings underscore the scalability and adaptability of these technologies in diverse agricultural landscapes, offering a pathway to sustainable and efficient farming practices.

Keywords: Solar Energy, Precision Agriculture, IoT, AI, Information Technology, Data Analytics, Sustainable Farming