

Design and Fabrication of Solar Hector Wheel Hoe

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Abstract: Agriculture in India is highly dependent on manual labour, particularly for inter-row weeding operations, which are labour-intensive, time-consuming, and physically demanding. The increasing cost of fuel and the scarcity of farm labour necessitate the development of sustainable and affordable mechanized solutions. This paper presents the design and fabrication of a solar-powered hectare wheel hoe intended to reduce human effort while improving weeding efficiency for small and marginal farmers. The system integrates a photovoltaic panel, rechargeable battery, DC motor, and a mechanical wheel hoe mechanism. Solar energy is harnessed to power the motor, which drives the weeding blade through a transmission system. Experimental trials indicate that the proposed system reduces operator fatigue, eliminates fuel dependency, and provides an eco-friendly alternative to conventional weeder. The developed solar hectare wheel hoe is cost-effective, simple to operate, and suitable for rural agricultural applications.

Keywords: Solar Energy, Wheel Hoe, Agricultural Mechanization, Renewable Energy, Weeding Machine