



# AGRI MAGAZINE

(International E-Magazine for Agricultural Articles)

Volume: 03, Issue: 04 (April, 2026)

Available online at <http://www.agrimagazine.in>

© Agri Magazine, ISSN: 3048-8656

## A Solar Power Operated Grass Cutter

\*T. Mahesh Babu<sup>1</sup>, P. Kesava<sup>2</sup>, G. Keerthi<sup>3</sup>, T. Neeraja<sup>4</sup> and A. Subramanyam<sup>5</sup>

<sup>1</sup>Teaching Associate, Department of Farm Machinery and Power Engineering, Polytechnic of Agricultural Engineering, Kalikiri, Acharya N.G. Ranga Agricultural University, Lam, Guntur, India

<sup>2</sup>Diploma student, Department of Agricultural Engineering, Polytechnic of Agricultural Engineering, Kalikiri, Acharya N.G. Ranga Agricultural University, Lam, Gunutr, Andhra Pradesh, India

<sup>3</sup>Diploma student, Department of Agricultural Engineering, Polytechnic of Agricultural Engineering, Kalikiri, Acharya N.G. Ranga Agricultural University, Lam, Guntur, Andhra Pradesh, India

<sup>4</sup>Diploma student, Department of Agricultural Engineering, Polytechnic of Agricultural Engineering, Kalikiri, Acharya N.G. Ranga Agricultural University, Lam, Gunutr, Andhra Pradesh, India

<sup>5</sup>Scientist, Department of Agronomy, Agriculture Research Station, Utukur, Acharya N.G. Ranga Agricultural University, Lam, Guntur, Andhra Pradesh, India

\*Corresponding Author's email: [maheshbabutumati7@gmail.com](mailto:maheshbabutumati7@gmail.com)

Grass cutting is a common task in both agriculture and landscaping, playing a crucial role in maintaining green spaces and farmland. However, traditional methods of cutting grass often rely on manual labour or fossil fuel-powered machines, both of which can have negative environmental impacts and may not be economically sustainable. In response to the increasing demand for eco-friendly and cost-effective alternatives (Duenas *et al.*, 2024).

The modern designs of these machines are now safer for residential use. Although a variety of grass cutters are available in the market today, particularly from an ergonomic perspective. Certain aspects, such as the blade shape and material, as well as issues related to fuel usage, limited electric movement, and lack of flexibility, still require redesign (Sachin Prabha and Prashanth Sachin, 2016).

To address this, the design approach simplifies the product structure, reduces both assembly time and cost and enables measurable improvements. This report primarily focuses on a specific landscape tool, the Solar Grass Cutter. The solar panel captures sunlight, with light rays causing temperature changes on its surface, thereby creating the optimal conditions for solar energy generation (Sachin Prabha and Prashanth Sachin, 2016).

### Environmental Impact Assessment of Traditional Grass Cutting Methods

The goal of this research is to advance sustainable agricultural practices and foster technological innovation in grass cutting machinery. According to (Duenas *et al.*, 2024), by creating an efficient and eco-friendly solution, we expect to achieve positive outcomes in environmental conservation, economic sustainability, and enhanced agricultural productivity.

### Solar-Powered Agricultural Machinery: Opportunities and Challenges

Solar energy offers a promising solution for powering agricultural machinery, providing a renewable and eco-friendly alternative to conventional fossil fuel-powered systems. This study investigates the opportunities and challenges involved in incorporating solar power into farming equipment. By assessing the feasibility, efficiency, and potential uses of

solar energy in agriculture, the research aims to highlight the contribution of solar-powered machinery to sustainable farming practices (Zhang, Y., Liu, Y., & Li, H., 2021).

## How Solar Grass Cutter Working

Solar grass cutters are equipped with photovoltaic (PV) panels that capture sunlight and convert it into electrical energy, which is stored in rechargeable batteries. The stored power runs a DC or brushless motor that drives the cutting blades and may also power wheels, sensors, and other electronics.

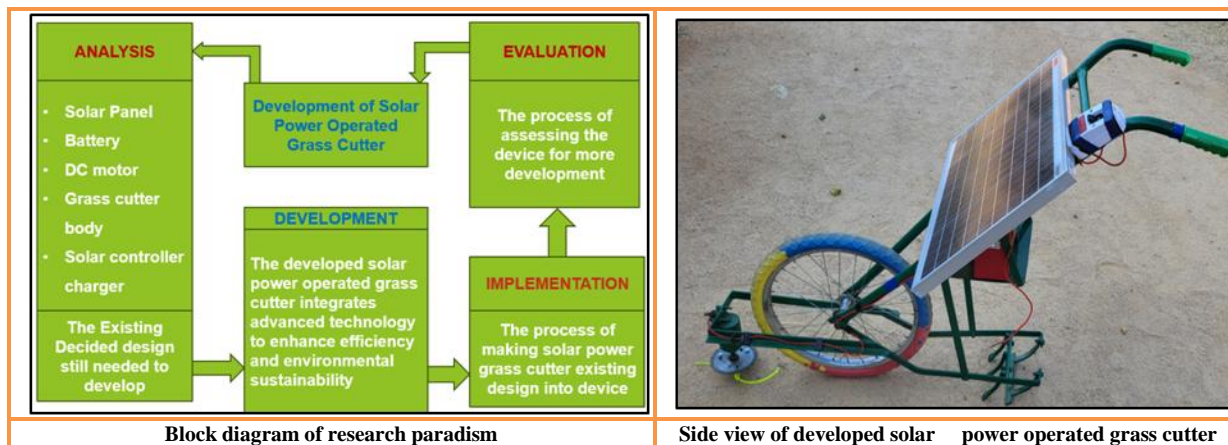


Fig. 1. Block diagram of research paradigm

## Key Features

- **Zero Emissions:** Runs entirely on solar power, eliminating greenhouse gas emissions and fuel consumption.
- **Low Noise:** Operates quietly compared to fuel-powered mowers, making it ideal for residential areas.
- **Autonomous Operation:** Many solar cutters include sensors for object detection, path planning, and even remote or autonomous operation using IoT or microcontrollers.
- **Minimal Maintenance:** Fewer moving parts mean lower maintenance requirements than traditional mowers.

## Advantages Over Conventional Grass Cutters

- **Environmentally Friendly:** No reliance on fossil fuels or electricity from non-renewable sources, significantly reducing the carbon footprint.
- **Lower Operating Costs:** Solar power is free after the initial purchase; there are no ongoing fuel or high maintenance costs.
- **Portable and Versatile:** Can be used in remote or off-grid locations, including agricultural fields and public spaces.
- **Noise Reduction:** Much quieter, reducing disturbances in neighbourhoods and public areas.

## Smart and Automated Innovations

- **Obstacle Avoidance and Safety:** Ultrasonic sensors detect obstacles, and some models feature flame sensors for fire safety.
- **Customizable Cutting:** Adjustable cutting blades allow for grass to be trimmed at various heights to suit different needs.
- **Remote Monitoring:** Advanced models integrate IoT, allowing remote control and monitoring via smartphones or the internet.

## Applications

- **Home Lawns:** Ideal for everyday household lawn maintenance without pollution or high noise.
- **Public Spaces:** Suitable for parks, stadiums, and hotel grounds due to ease of use and minimal disruption.

- Agricultural Fields: Useful for grass and weed control in large fields where access to power may be limited.

## Conclusion

A solar power operated grass cutter brings together sustainability, technology, and convenience. As concerns for the environment and energy costs rise, these devices offer a practical alternative to traditional, polluting mowers, representing a significant stride toward cleaner and smarter lawn care. Overall, the solar-powered grass cutter represents a promising innovation in the field of sustainable agriculture and landscaping. Continued advancements in solar panel efficiency, battery technology, and automation can further improve its performance and adaptability for various terrains and grass types.

## References

1. Das et al. (2022). Design And Fabrication of Solar Powered Grass Cutter. B. Tech in Mechanical Engineering, Sathyabama Institute of Science and Technology. Chennai.
2. Duenas, Ramon. S., Felipe, S., A. Santiago. and Wilson, B., Gacutan. (2024). Development of an Improvised Solar Powered E-Grass Cutter: Utilizing Microcontroller Technology. *Int. J. of Latest Technol in Engg, Management & Applied Sci.* 13, no. 7: 69-81.
3. Sachin, Prabha., and Panshette, Sachin. (2016). Solar Grass Cutter Machine. *Int. J. For Technol. Res. In Engg.* 3: 2702-2706.
4. Zhang, Y., Liu, Y., & Li, H. (2021). Development of a Solar-Powered Grass Cutter Based on Renewable Energy. *Energies.*