Sri Eshwar College of Engineering
Coimbatore | Tamilnadu
An Autonomous Institution
Affiliated to Anna University, Chennai

## Department of Mechanical Engineering

**Course name /Course code: Innovative multidisciplinary Project / R19ME381**

**Title of the project : Agricultural seed spraying machine by using solar**

| | | |
|---|---|---|
| Class / Section / Semester | : | III MECH / VI |
| Batch | : | 2022-2026 |
| Project Review | : | Third Review |
| Date | : | 16/04/2025 |
| Project Guide with Designation | : | Mr. S. Gokul, B.E. (Gold Medalist),<br>M.E. (Engg. Design).,<br>Assistant Professor<br>Department of Mechanical Engineering<br>Sri Eshwar College of Engineering |
| Name of the Industry ( if applicable) | : | Agricultural Sector |
| Team Members | : | Adithya.T (722822114003)<br>Naga arjun.R (722822114026)<br>Santhosh.T (722822114039)<br>Tamilarasan.J (722822114047) |

# OVERVIEW

# CHALLENGE STATEMENT

- **Environmental and Economic Impact :** Conventional seed spraying methods rely heavily on fuel-powered vehicles, leading to increased operational costs and significant environmental pollution. This dependency on fossil fuels contributes to unsustainable farming practices.

- **Inefficiency of Manual Spraying :** Manual spraying processes are labor-intensive and time-consuming. They lack efficiency, particularly when covering large farmlands, making them less practical for modern agricultural needs.

- **Lack of Accessible Smart Solutions :** Small and medium-sized farmers face a shortage of cost-effective, solar-powered seed spraying vehicles. Additionally, the absence of wireless systems operable via mobile hotspots limits rural farmers' access to energy-efficient and smart farming technologies.

# LITERATURE SURVEY / BACKGROUND STUDY

| S. No | TITLE | AUTHOR | NAME OF ORGANIZATION &YEAR | DESCRIPTION |
|---|---|---|---|---|
| 1. | Solar Powered Sprayer -A Review | Alam et al. | International Journal of Current Microbiology and Applied Sciences, 2020 | • This study focuses on a movable solar-powered sprayer designed to reduce user fatigue, operational costs, and environmental damage caused by fuel-powered sprayers.<br>• It operates in both direct and indirect modes using solar energy and a battery. The system demonstrated efficiency in spraying operations and is particularly useful in rural areas with limited power supply. |
| 2. | Development and Manufacture of Solar Power Seed Sprayer Machine | Ammar A.M. Al-Talib et al. | Peer-reviewed Journal, IJARCCE, 2024 | • This paper introduces a solar-powered seed sprayer machine that integrates solar panels for energy generation and Bluetooth control for efficient seed sowing operations.<br>• The system is designed to reduce manual labor, improve precision, and promote sustainability by eliminating reliance on fossil fuels. |
| 3. | A Review on Solar-Powered Seed and Fertilizer Sprayer System | Ammar A.M. Al-Talib et al. | IJARESM, 2023 | • This review highlights the advantages of solar-powered seed and fertilizer sprayers, focusing on their ability to reduce environmental impact, operational costs, and manual effort.<br>• It also discusses challenges such as initial costs and weather dependency while emphasizing the potential for integration into precision agriculture systems. |

| S. No | TITLE | AUTHOR | NAME OF ORGANIZATION &YEAR | DESCRIPTION |
|---|---|---|---|---|
| 4. | Solar-Powered Plant Protection Equipment: Perspective and Prospects | M. Kandeeswaran, V. Kesavan | MDPI, 2022 | • This paper explores the use of solar-powered equipment in agriculture, including seed sprayers, to address challenges like high fuel costs and environmental pollution.<br>• It emphasizes the role of renewable energy in improving agricultural practices while aligning with Sustainable Development Goals (SDGs). |
| 5. | Solar Powered Seed Sprayer Machine | Ammar A.M. Al-Talib et al. | Semantic Scholar | • This study focuses on the design of a solar-powered seed sprayer machine that operates using renewable energy to achieve efficient seed distribution.<br>• It highlights the system's ability to reduce labor intensity while addressing environmental concerns associated with traditional methods. |
| 6. | Design and Fabrication of Solar Seed Sprayer Machine | T. Ravi, D. GobiGanesh | Proceedings of International Conference on Artificial Life and Robotics, 2024 | • Focuses on developing a solar-powered seed sprayer machine to reduce manual labor, enhance seed distribution efficiency, and promote sustainability in agriculture.<br>• Incorporates Bluetooth control and DC motors for automation |

# EXISTING METHOD

- Seed spraying is commonly done using manual hand sprayers, tractor sprayers, or engine-powered equipment, all requiring continuous human effort and fossil fuel consumption, which increases costs and environmental pollution.

- Advanced automated sprayers and drones exist but are expensive and often inaccessible to small and medium-sized farmers.

- Most current systems do not offer solar-powered operation or wireless control, making them less practical for rural and off-grid farming communities.

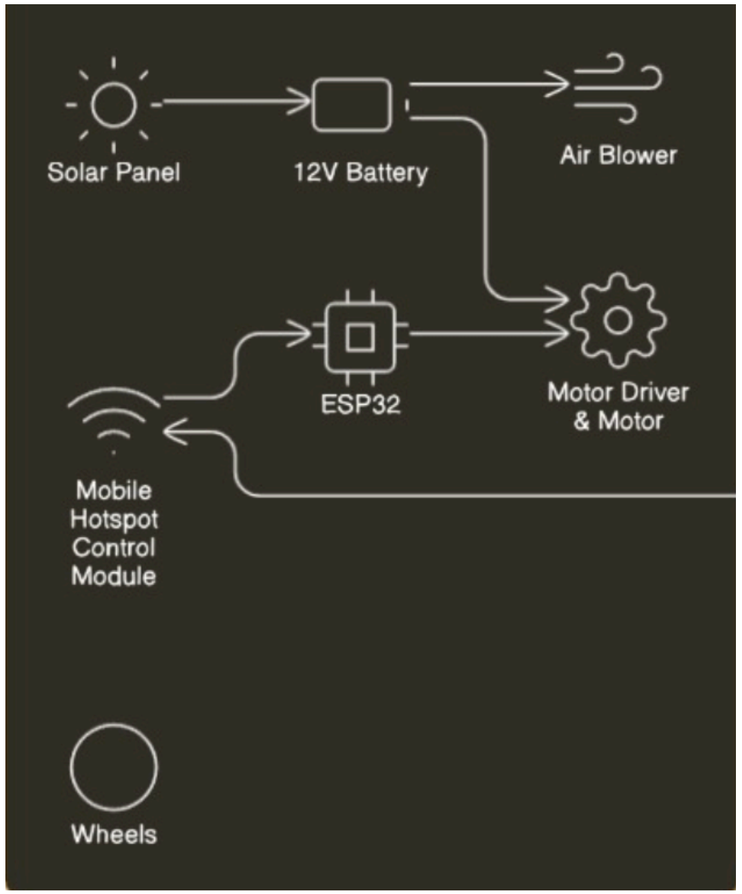
# PROPOSED / INNOVATIVE METHOD

- **Fuel-Free, Cost-Effective Operation :** The project proposes a solar-powered seed spraying vehicle to reduce dependence on fuel and lower operational costs for farmers.

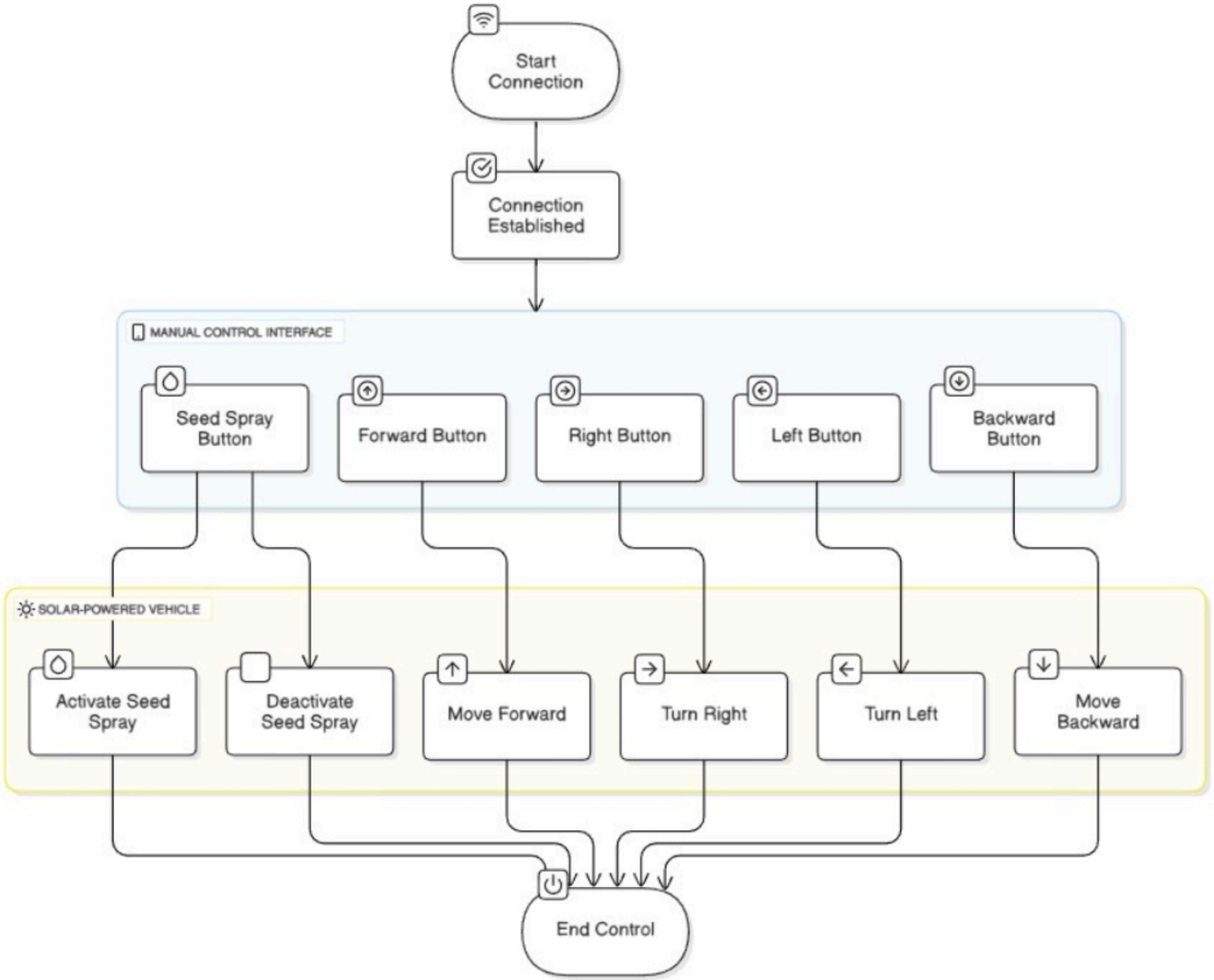
- **Simple, Efficient System Design :** The vehicle consists of a basic frame with a solar panel, 12V battery, motor-driven wheels, and an air blower for seed spraying, ensuring efficient and reliable operation.

- **Remote Control and Farmer-Focused Benefits :** Powered by solar energy and remotely controlled via a mobile hotspot, this environmentally friendly system is tailored for small and medium-sized farmers, offering an affordable and sustainable solution for precision farming.

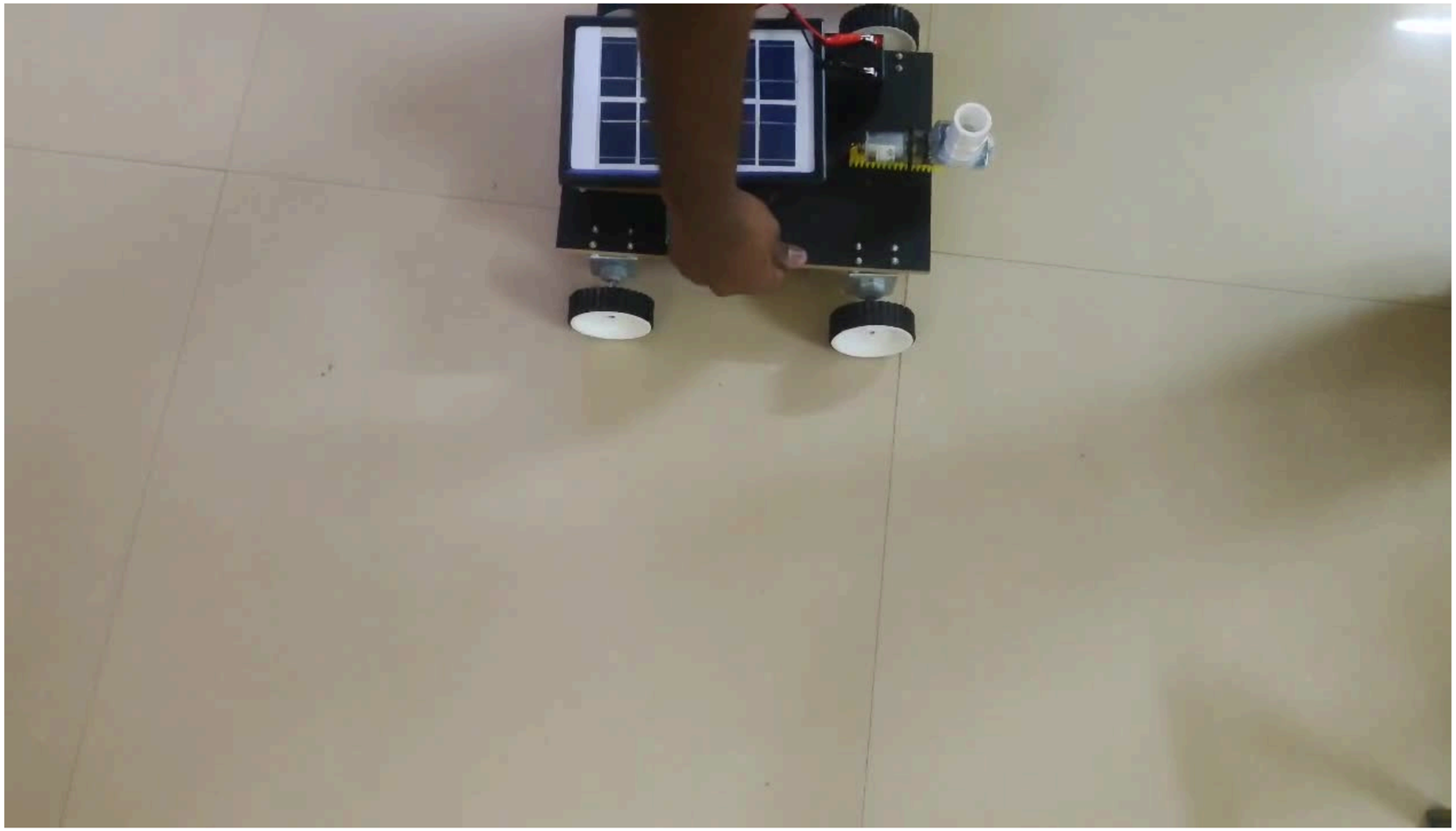
# BLOCK / SCHEMATIC DIAGRAM



# USE CASE DIAGRAM



# SOFTWARE / HARDWARE IMPLEMENTATION VIDEO



# DESCRIPTION OF SOFTWARE/HARDWARE IMPLEMENTATION

**Runs on Solar Power:**

- Uses sunlight to charge its battery, so it doesn’t need fuel and is good for the environment.

**Strong and Easy to Move:**

- Has four sturdy wheels and motors to move easily in the field.

**Easy to Control:**

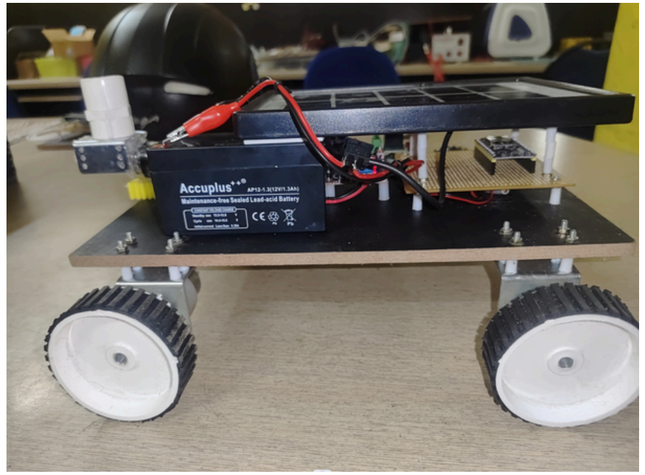
- Can be driven and used with a simple app on your phone.

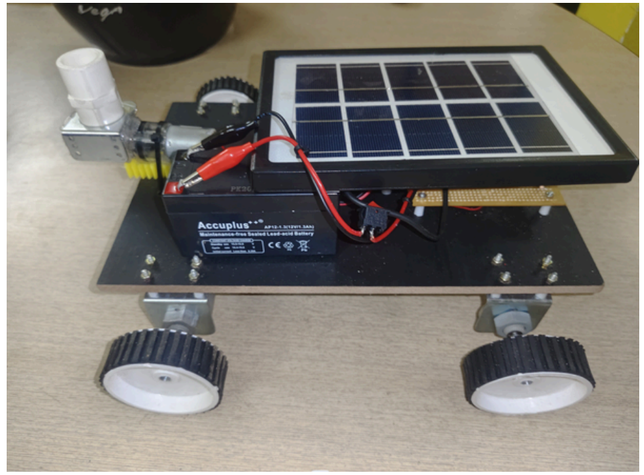
**Great for Farmers:**

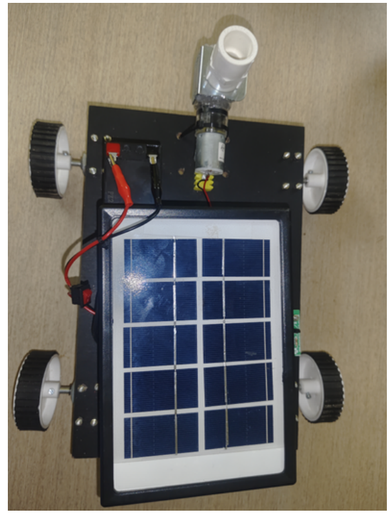
- Saves money, is easy to use, and works well for small and medium farms.

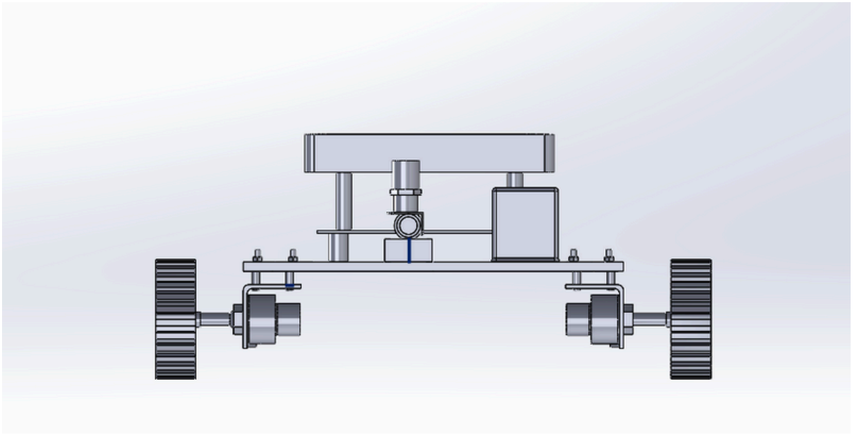
# EXPERIMENTAL RESULTS

- The solar-powered seed spraying vehicle was built and tested in real field conditions.
- It moved easily in all directions using a mobile phone and the Blynk app.
- The vehicle worked well with just solar power and didn’t need any fuel.
- It was easy to control, sprayed seeds well, and was good for the environment, making it a smart choice for small and medium farmers.

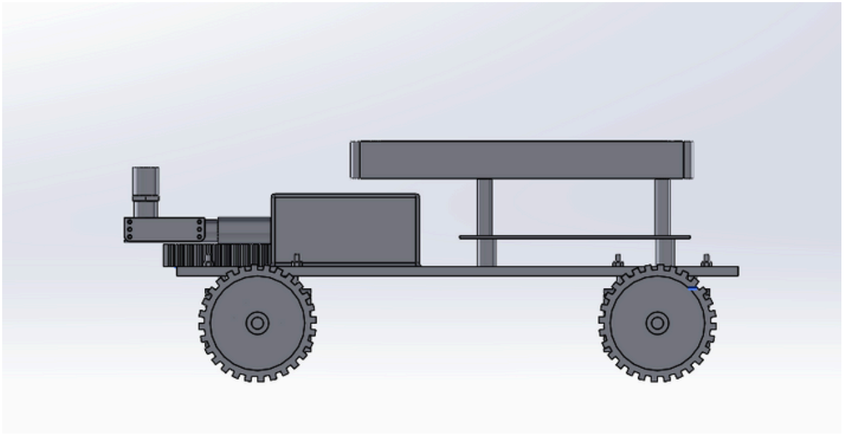


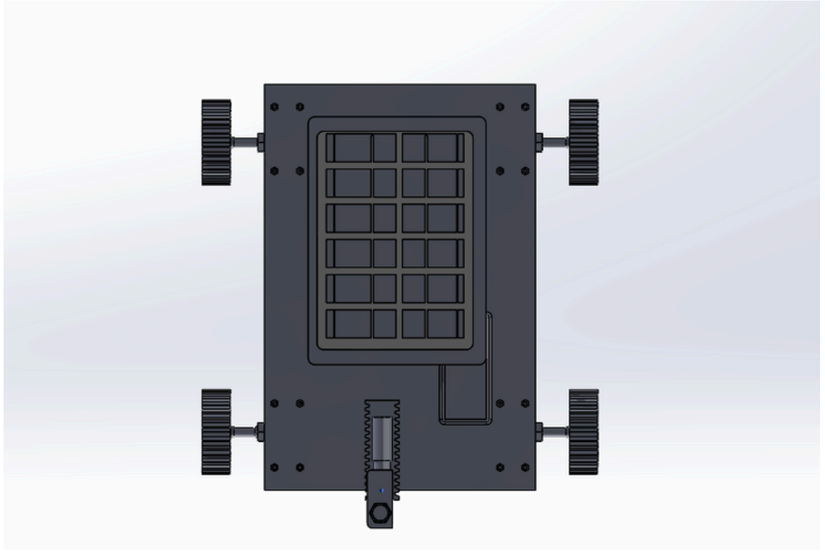





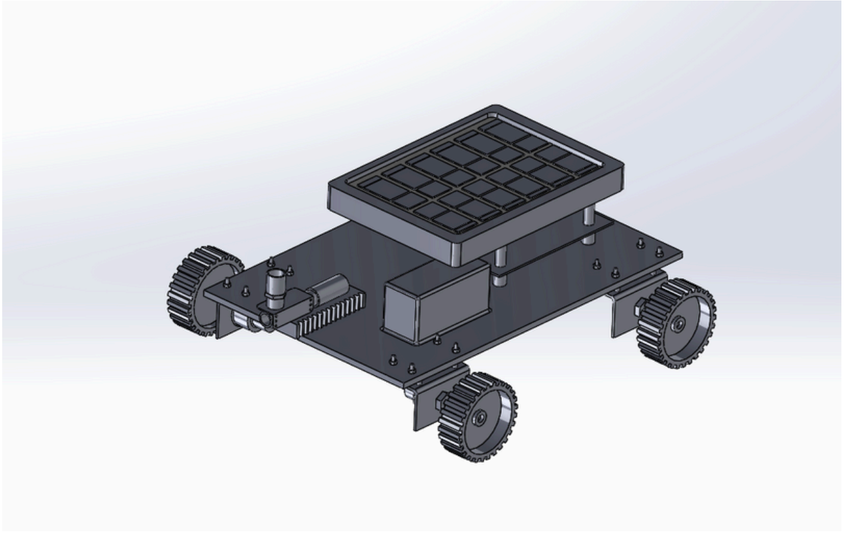
**Front view**



**Side view**

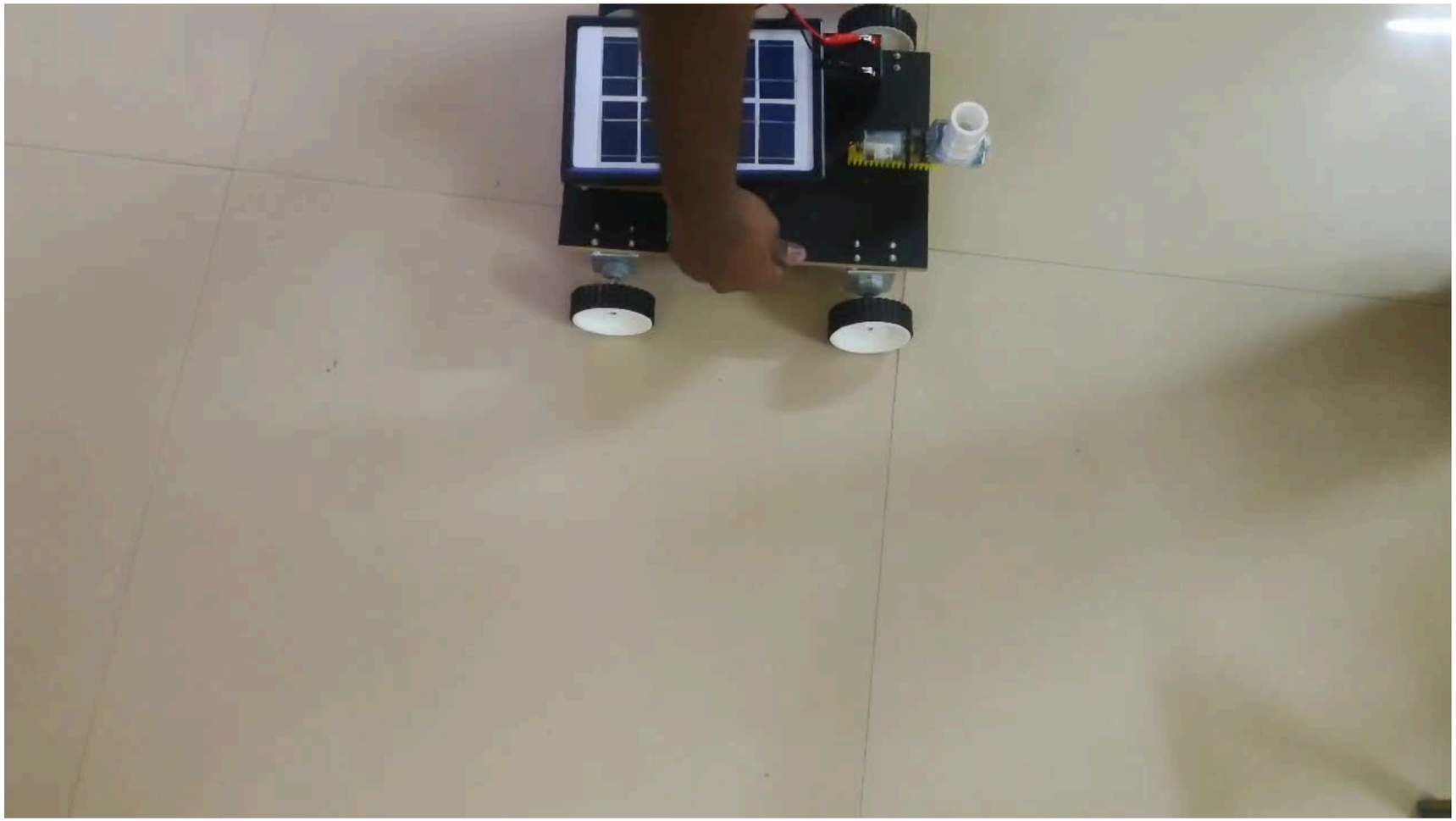


**Top view**



**Isometric view**

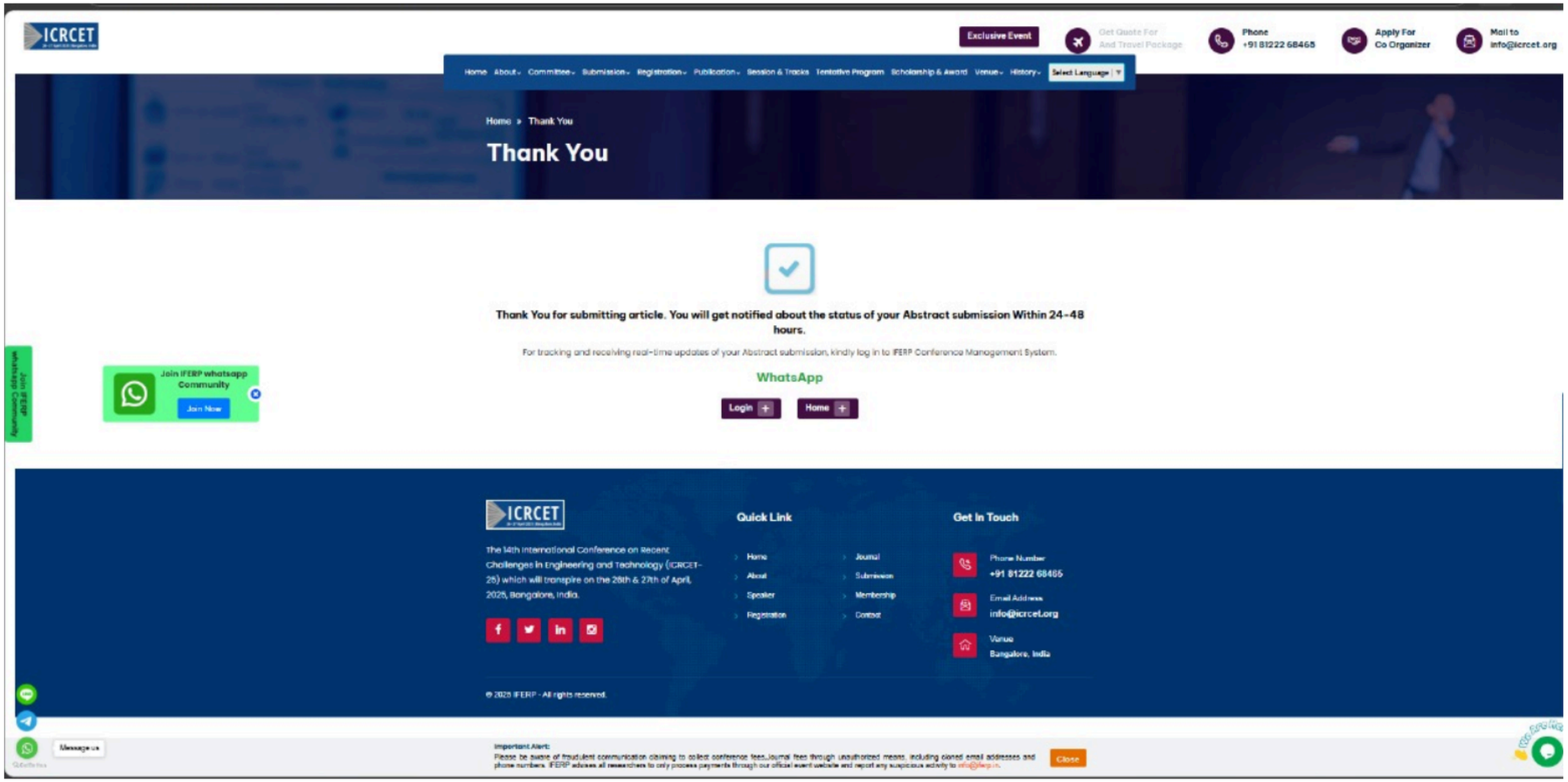
# Experimental Video



# CONCLUSION & FUTURE WORK

- The vehicle was controlled by a mobile hotspot, didn’t need a driver, and used solar power, so it saved energy and was good for the environment.
- It was easy to use, worked well, and was affordable for farmers.
- In the future, the vehicle can be improved with features like GPS, sensors to check seed and fertilizer levels, obstacle detection, and better solar panels.
- The design can also be changed to work with different types of seeds or fertilizers, making it more useful for farmers.

# PAPER PUBLICATIONS



# REFERENCES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- https://www.academia.edu/122011603/Development_and_Manufacture_of_Solar_Power_Seed_Sprayer_Machine
- https://ijarcce.com/papers/development-and-manufacture-of-solar-power-seed-sprayer-machine/
- https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3645393
- https://www.mdpi.com/1996-1073/15/19/7379

# THANK YOU