IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429
Volume 5, Issue 10, June 2025
Impact Factor: 7.67

Soil Sensing, Seed Sowing and Weed Cutting Robot

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Abstract: *Agriculture is essential for human survival and plays a key role in building a sustainable future. With the rising need for better and more efficient farming methods, technology is helping farmers solve challenges in smart and eco-friendly ways. This paper introduces a robot designed to help farmers with tasks like soil monitoring, seed sowing, and weed cutting to make farming easier and more productive. The system is built around an ESP8266 microcontroller, which connects different sensors and tools to perform farming tasks. A DHT11 sensor checks the temperature and humidity of the environment, while a soil moisture sensor ensures the soil has enough water for healthy crop growth. The robot can be controlled remotely using a Telegram app or Bluetooth through an HC-05 module. The robot uses an L298N motor driver to move around the field and to power different farming tools. It can cut weeds using a DC motor and plant seeds with a servo motor. A water sprayer is also included to help with irrigation. To make monitoring easy, the robot has an ESP-32 camera that provides a live view of the field. All the components are powered by a central power supply. This robot makes farming tasks less time-consuming and helps save resources like water and energy. It is an affordable and useful tool for small and medium-sized farmers who want to adopt modern and sustainable farming practices.*

Keywords: smart farming, sustainable agriculture, soil moisture sensor, seed sowing, weed cutting, DHT11 sensor, ESP8266, water sprayer, easy farming solutions

DOI: 10.48175/IJARSCT-28801