# DESIGN AND DEVELOPMENT OF A DISTRIBUTED SOIL PURITY MONITORING SYSTEM USING DETECTORS FOR LARGE AGRICULTURAL FIELDS

**Abstract**

The excessive use of pesticides and chemically contaminated irrigation water has resulted in significant soil pollution, especially across large agricultural fields, leading to reduced crop yield and long-term soil degradation. This B.Tech group mini project focuses on the design and development of a distributed soil purity monitoring system using multiple detector units deployed across vast agricultural land. The proposed system aims to provide continuous and accurate assessment of soil health and contamination levels.

Each detector unit is integrated with sensors to measure essential soil parameters such as pH, electrical conductivity, moisture content, and chemical imbalance indicators. These detector units are strategically placed throughout the field to capture spatial variations in soil purity, ensuring more reliable results compared to conventional single-point testing methods. The collected data is transmitted to a central monitoring unit for analysis, enabling early detection of contaminated zones and timely corrective actions.

From an Entrepreneurship and Innovation perspective, the proposed system offers a scalable, cost-effective, and commercially viable solution for precision agriculture. The modular design supports easy expansion for large-scale applications. The project also considers Intellectual Property Rights aspects by identifying novelty and patentability potential. Overall, the system promotes sustainable agriculture while delivering technological, economic, and environmental benefits.