

AN INTELLIGENT FRAMEWORK FOR SMART AGRICULTURE SYSTEM USING RANDOM FOREST ALGORITHM

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Agriculture is the foundation of our civilization, but the challenges posed due to erratic weather patterns and persistent pest outbreaks, led to significant crop losses year after year. In response, this paper presents a comprehensive approach to address these issues by leveraging machine learning techniques for precise crop yield predictions. By analyzing historical data collected from diverse regions and states within India encompassing soil nutrient content, pH levels, temperature and previous years rainfall patterns the proposed system aims to provide precise Crop production forecasts customized for the various circumstances present in India. The algorithms employed were Randomized Search, XG Boost, Random Forest, Decision Tree, KNN, and Linear Regression produced accuracy range of 64 to 93%. By offering granular insights into crop yield predictions, our system enhances resource allocation, informs crop selection, and helps mitigate risks. This, in turn, leads to improved food security, less food waste, and improved production efficiency overall.