

AI-BASED SMART AGRICULTURE FOR SUSTAINABLE RURAL DEVELOPMENT IN INDIA: A SOCIO-TECHNOLOGICAL STUDY

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Smart agriculture is a concept of using AI to make farming more efficient and less prone to failure. This research paper talks about the efforts done in the study of crop yield prediction by applying machine learning. The research specifically employed a huge Indian dataset in the course of the experimental work. This dataset contained over 50,000 data instances with soil, climate, and fertilizer characteristics. Incorporating posing of great potential the incorporated data consists of yield, soil, fertilizer and weather-related information. To achieve this goal, three machine learning models are employed namely Linear Regression, Support Vector Regression, and Random Forest Regressor. These models were used to predict the crop yield in kg per hectare and afterward, their performances are compared via MAE, RMSE, and R^2 . The chosen algorithm of Random Forest performs the best among others, showing the least error and the highest R^2 . In addition, the paper covers the social and economic impacts and how AI-based farming is helping rural sustainability. According to the research, AI can significantly benefit farmers, the city planner, and the policy implementer, thus supporting the long-term development of rural India.
