



FARM FUSION

CROP RECOMMENDATION
SYSTEM

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INTRODUCTION

In agriculture, the precise recommendation of crops is pivotal in ensuring optimal yield and sustainability. As farmers and agricultural experts delve deeper into data-driven approaches, the significance of leveraging comprehensive datasets, particularly those about soil composition, becomes increasingly evident.





PROBLEM STATEMENT

Failure of farmers to decide on the best suited crop for the land using traditional and non-scientific methods

RELATED WORK

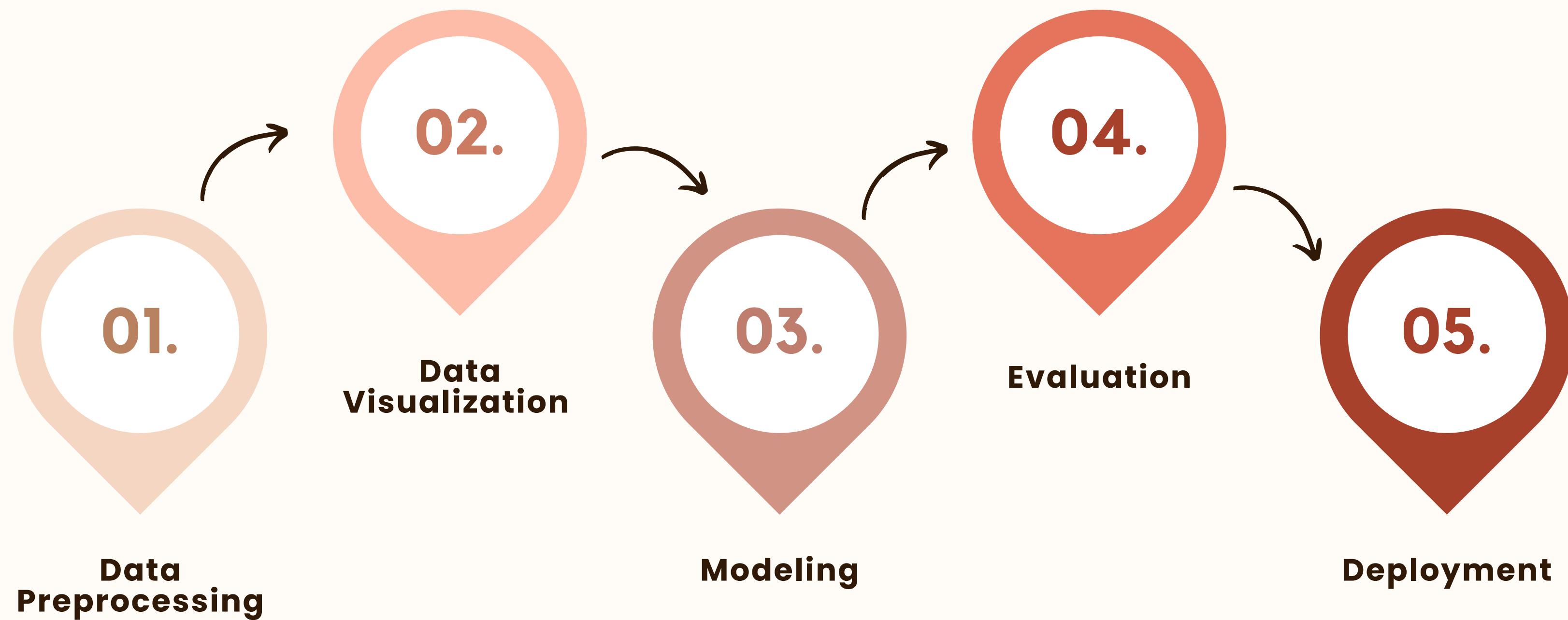
YEAR	PUBLISHED IN	PAPER TITLE	METHOD	RESULT
2022	Elsevier	Smart farming using Machine Learning and Deep Learning techniques	K-Nearest Neighbor (KNN) Naïve Bayes Logistic Regression Support Vector Machine (SVM) Decision Tree Bagging Random Forest AdaBoost Gradient Boosting XGBoost Ibgm	K-Nearest Neighbor: 84.27% Naïve Bayes: 94.72% Logistic Regression: 63.90% Support Vector Machine: 65.18% Decision Tree: 92.18% Bagging : 92.54% Random Forest: 92.54% AdaBoost: 12.9% Gradient Boosting: 90.45% XGBoost: 91.72% Ibgm: 93.45%
2022	Technoscience Academy	IoT Framework for Measurement and Precision Agriculture: Predicting the Crop Using Machine Learning Algorithms	Used WEKA classifiers: MLP Decision table (Dt) JRip	MLP: 98.22% Decision table: 88.59% JRip: 96%
2021	IJSRCSEIT	Crop Recommendation System using Machine Learning	Decision Tree Naïve Bayes Support Vector Machine Logistic Regression Random Forest XGBoost	Decision Tree: 90% Naïve Bayes : 99% Support Vector Machine: 10.68% Logistic Regression: 95.22% Random Forest: 99% XGBoost: 99.31%

PROPOSED METHODOLOGY

Dataset

It is **multi-class classification** problem. We used Crop Recommendation dataset from Kaggle. The dataset contains wealth of information including key factors such as **Nitrogen, Phosphorus, and Potassium levels**, alongside environmental variables like **Temperature, Humidity, pH_Value, and Rainfall**. The dataset is about **2200 entries** with a variety of crops: **Rice, Maize, Chickpea, Kidney Beans, Pigeon Peas, Moth Beans, Mung Bean, Blackgram, Lentil, Pomegranate, Banana, Mango, Grapes, Watermelon, Muskmelon, Apple, Orange, Papaya, Coconut, Cotton, Jute, Coffee.**

Solution Workflow

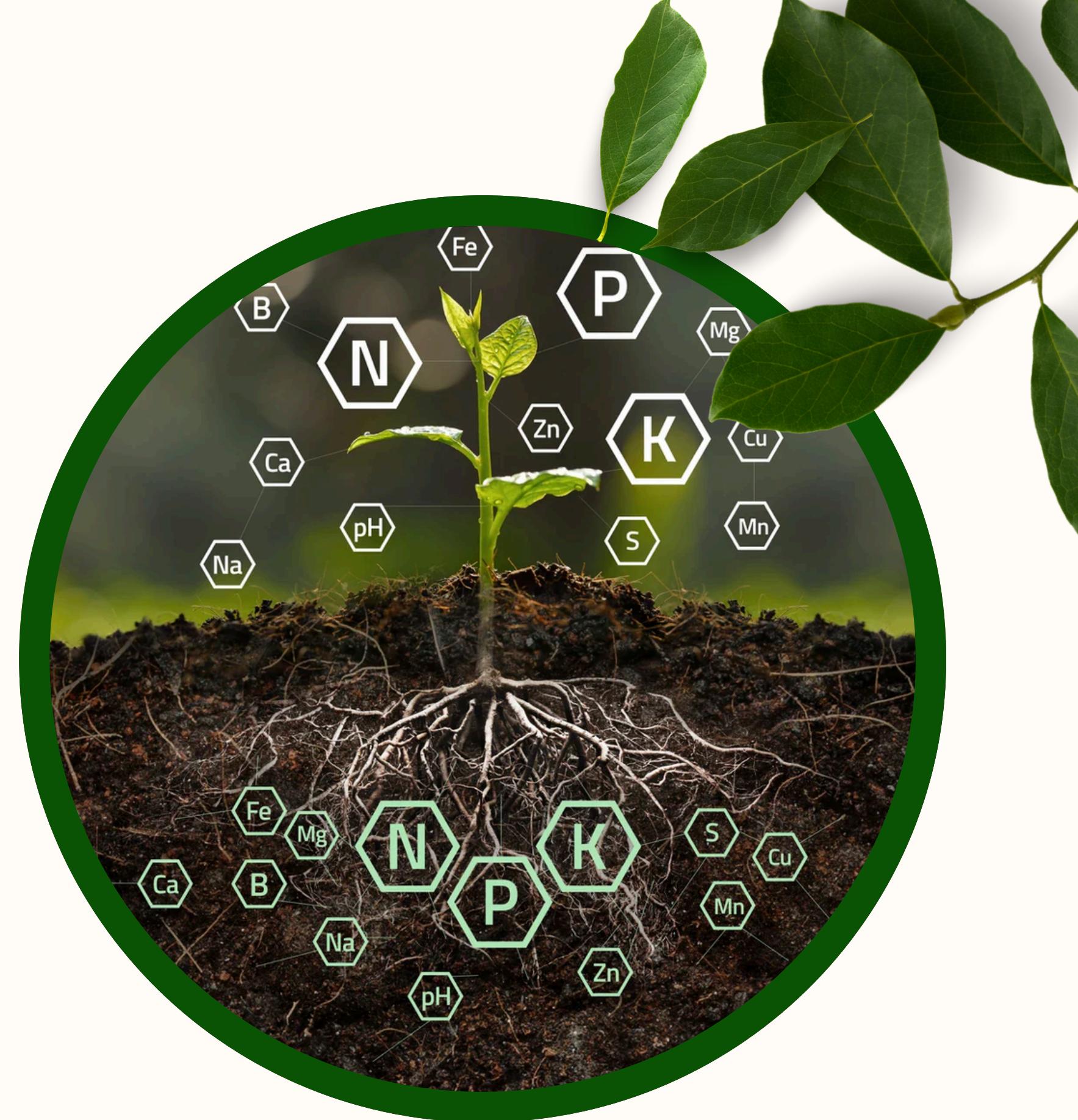


RESULTS

Models	Accuracy
Naive Bayes	99.4886 %
Dection Tree	98.1250 %
KNN	97.5568 %
Logistic Regression	90.2841
AdaBoost	15.5682 %

CONCLUSION

Leveraging soil data for crop recommendations is vital for modern agriculture. It enables informed decisions that optimize productivity, improve resource management, enhance sustainability, boost climate resilience, and increase profitability. Data-driven strategies form the foundation of efficient and sustainable agricultural practices, ensuring a resilient future for the sector.





THANK YOU