



CROP RECOMMENDATION SYSTEM

USING MACHINE LEARNING

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WHAT IS CROP RECOMMENDATION?

It refers to the method of using machine learning to suggest the most suitable crop for a specific location based on various factors.

WHY IS IT IMPORTANT?

- Farmers face challenges in choosing the right crop
- MI can recommend crops using Soil, weather and crop data



OUR PROJECT

- Crop yield depends on multiple factors like soil, climate, rainfall, etc.
- Hence, there is a need for smart, automated and accurate recommendations.

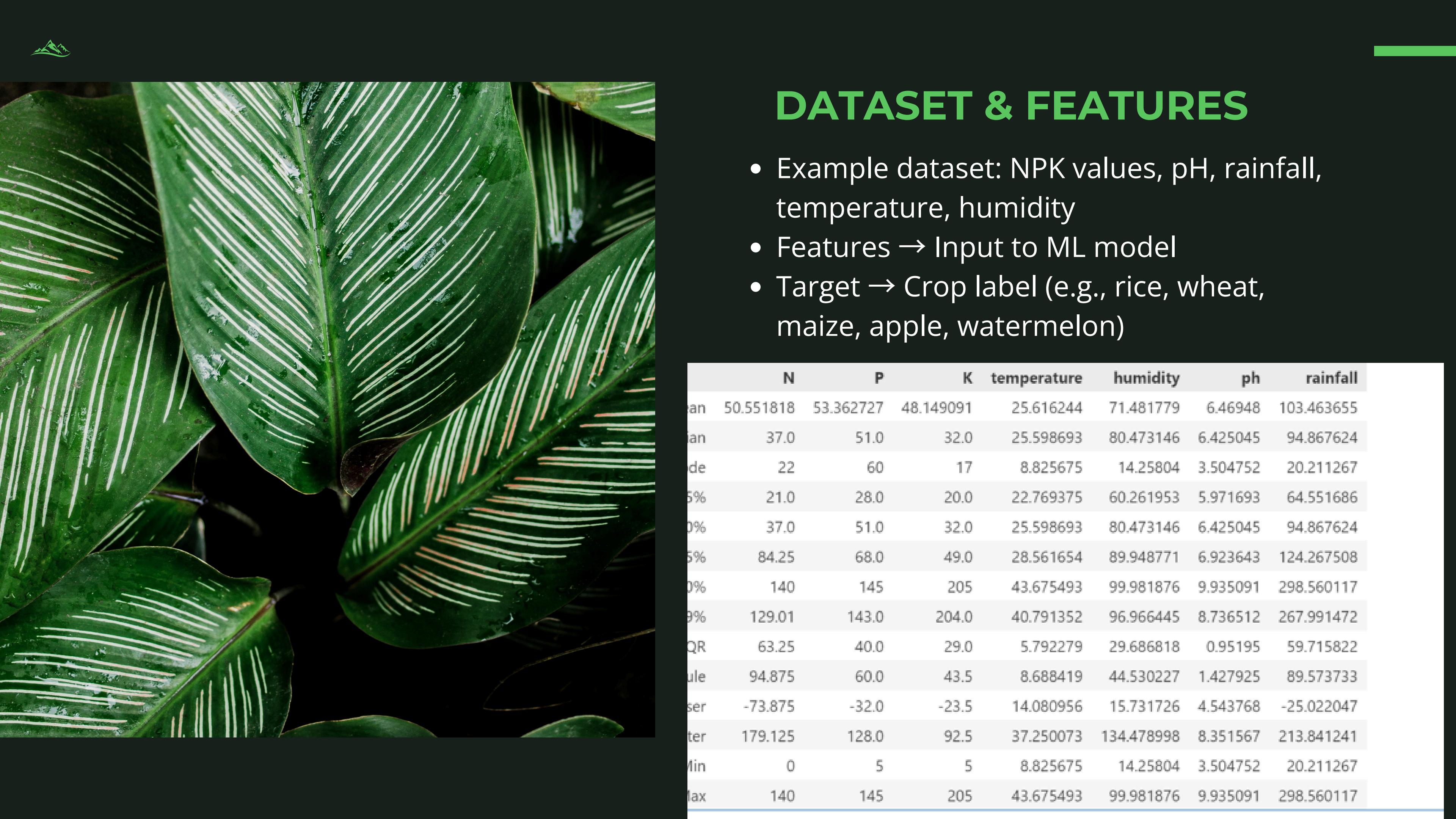




OBJECTIVES

- To build a ML model that predicts the best crop
- To use soil & climate parameters as inputs
- To provide actionable insights for farmers





DATASET & FEATURES

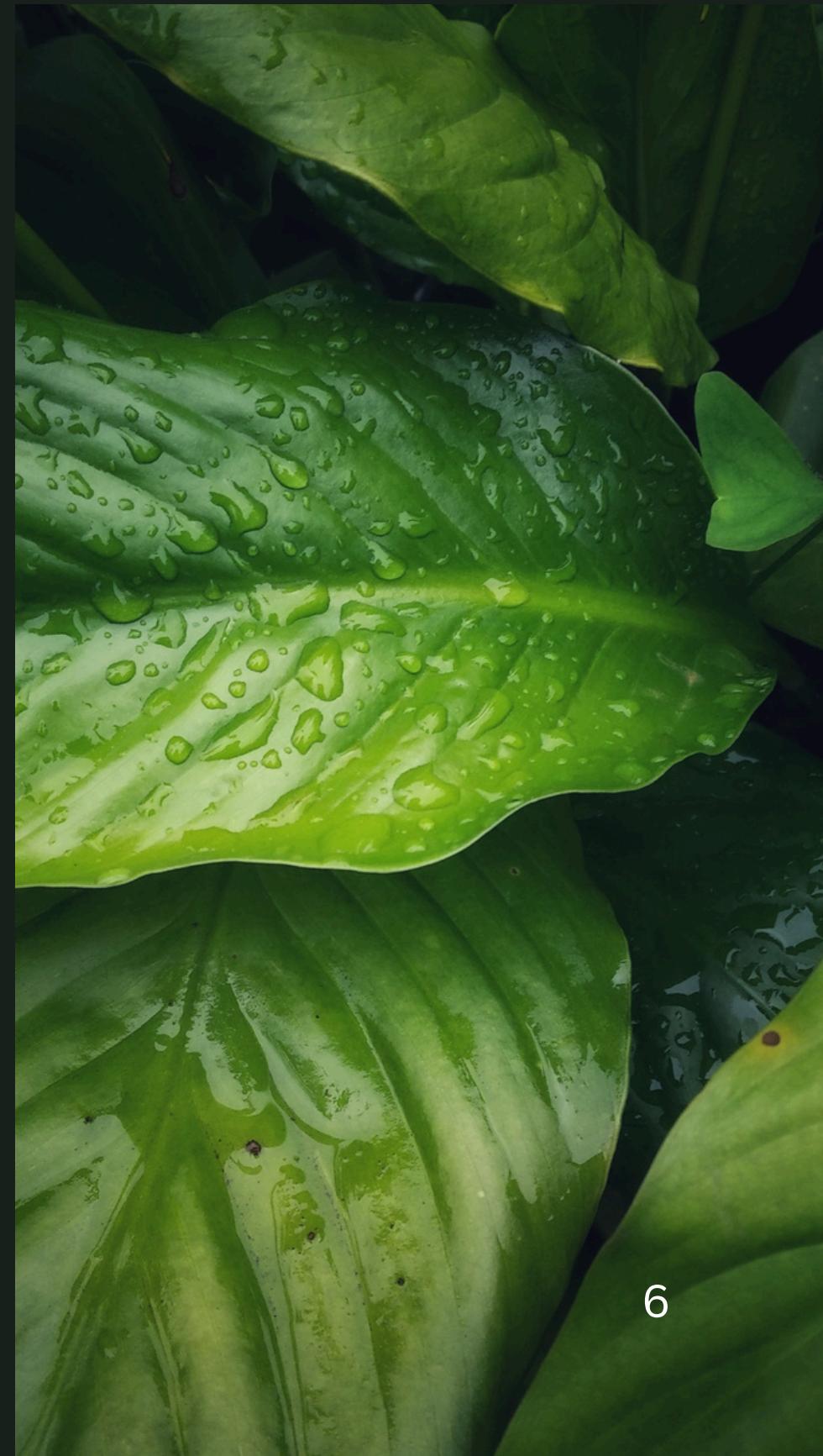
- Example dataset: NPK values, pH, rainfall, temperature, humidity
- Features → Input to ML model
- Target → Crop label (e.g., rice, wheat, maize, apple, watermelon)

	N	P	K	temperature	humidity	ph	rainfall
Jan	50.551818	53.362727	48.149091	25.616244	71.481779	6.46948	103.463655
Jan	37.0	51.0	32.0	25.598693	80.473146	6.425045	94.867624
de	22	60	17	8.825675	14.25804	3.504752	20.211267
5%	21.0	28.0	20.0	22.769375	60.261953	5.971693	64.551686
0%	37.0	51.0	32.0	25.598693	80.473146	6.425045	94.867624
5%	84.25	68.0	49.0	28.561654	89.948771	6.923643	124.267508
0%	140	145	205	43.675493	99.981876	9.935091	298.560117
9%	129.01	143.0	204.0	40.791352	96.966445	8.736512	267.991472
QR	63.25	40.0	29.0	5.792279	29.686818	0.95195	59.715822
ule	94.875	60.0	43.5	8.688419	44.530227	1.427925	89.573733
ser	-73.875	-32.0	-23.5	14.080956	15.731726	4.543768	-25.022047
ter	179.125	128.0	92.5	37.250073	134.478998	8.351567	213.841241
Min	0	5	5	8.825675	14.25804	3.504752	20.211267
Max	140	145	205	43.675493	99.981876	9.935091	298.560117



METHODOLOGY (ML PIPELINE)

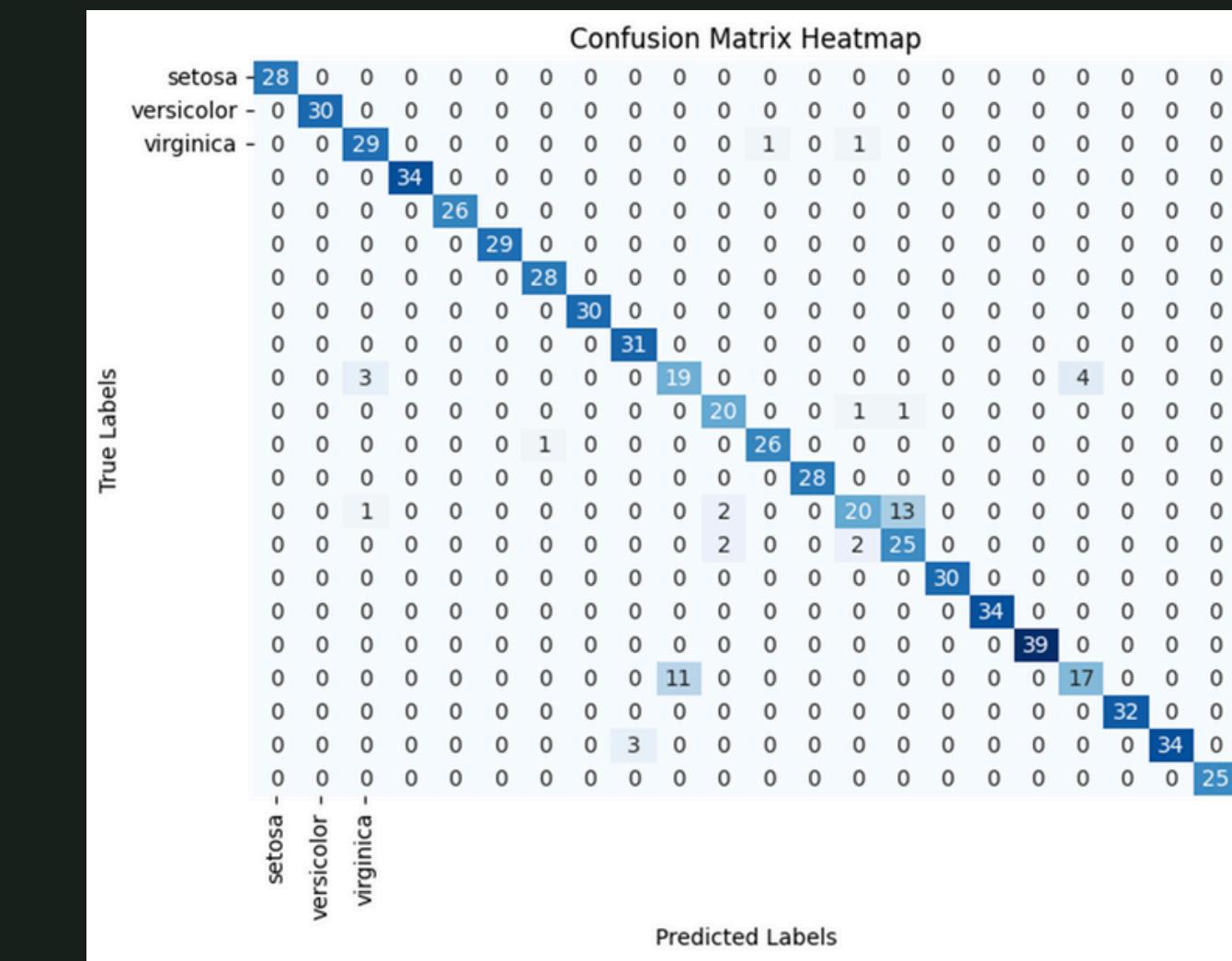
- Data Collection (dataset - N, P, K ,temperature,humidity,pH)
- Data Preprocessing (cleaning, normalization)
- Model Selection (Decision Tree, RandomForest, SVM, etc.)
- Training & Testing (split dataset, accuracy check)
- Prediction (recommend crop)





MODEL EXAMPLE & ACCURACY

- Algorithm used: e.g., Random Forest Classifier
- Performance metrics: Accuracy, Precision, Recall
- Graph/Confusion Matrix showing results





CROP RECOMMENDATION EXAMPLES

**INPUT-117,32,34,26.272418
OUTPUT-APPLE**

**INPUT-117,30,50,24.90123
OUTPUT-WATERMELON**

The screenshot shows a web-based crop recommendation tool. At the top, there's a navigation bar with 'Home' and 'CKD'. Below it, the main title is 'Crop Recommendation' with a note 'Please enter repetitive fields'. There are four input fields for nutrient levels: 'Nitrogen*' containing '68', 'Phosphorus*' containing '58', 'Potassium*' containing '38', and a dropdown menu for 'Rain fall*' containing '221'. A blue 'upload' button is located below the rain fall field.

**Crop Recommendation
For the values**

Nitrogen:68

Phosphorus:58

Potassium:38

Rain_fall:221

You **will** have Crop Recommendation:**others**

[CKD Prediction](#)



BENEFITS

Data-driven decision-making
Increased yield & farmer income
Scalable with mobile apps

CHALLENGES

Quality dataset required
Need real-time weather data
Farmers' digital adoption



CONCLUSION & FUTURE SCOPE

- ML makes crop recommendation smarter & reliable
- Can integrate with IoT sensors & mobile apps
- Future: Region-specific recommendations, AI-powered advisory systems