



Farmalytics

Empowering Farmers with smart insights

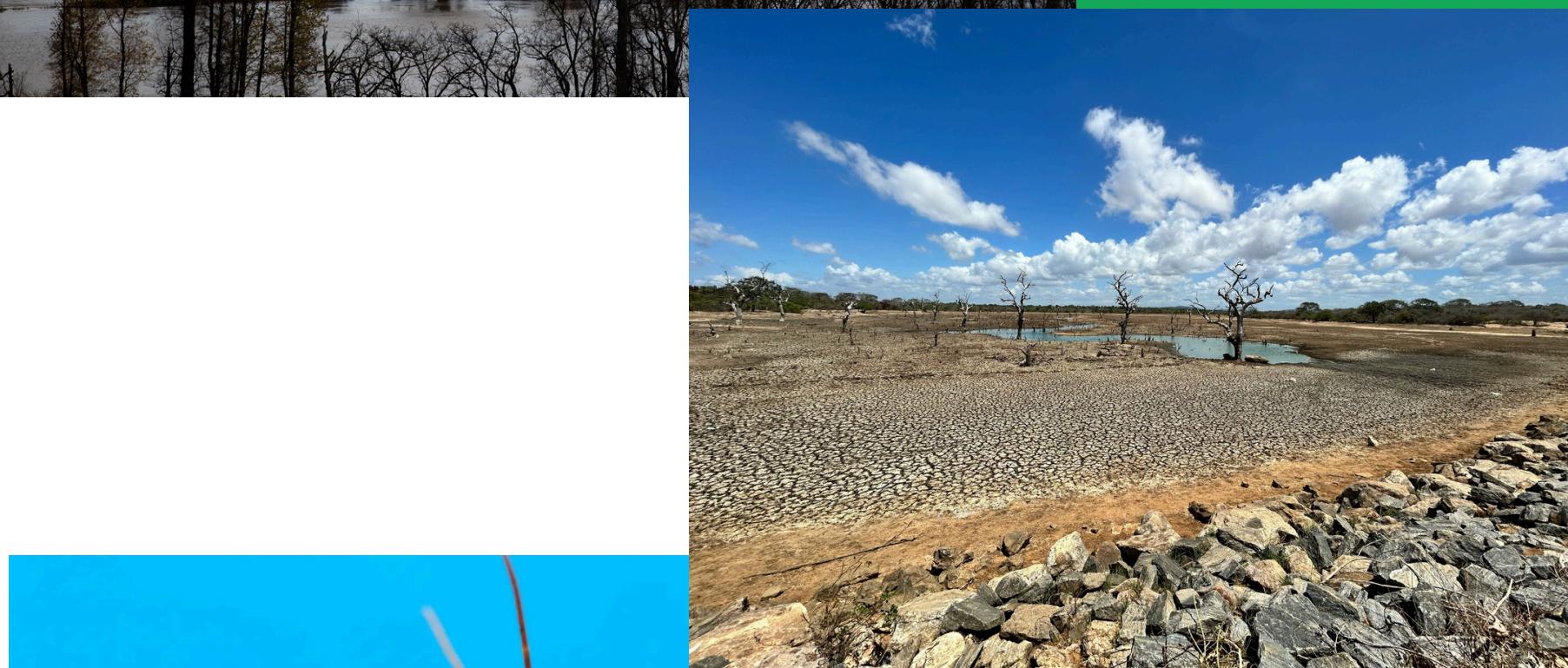
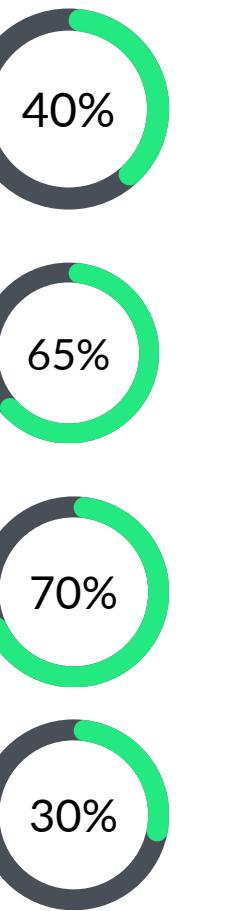
FARMALYTICS.

Anand Lo, Het Jivani, Joy Liu, Ahmad Kammonah

“Leveraging Earth Observation Data for Informed Agricultural Decision-Making” - NASA Space Apps 2024

What is the problem?

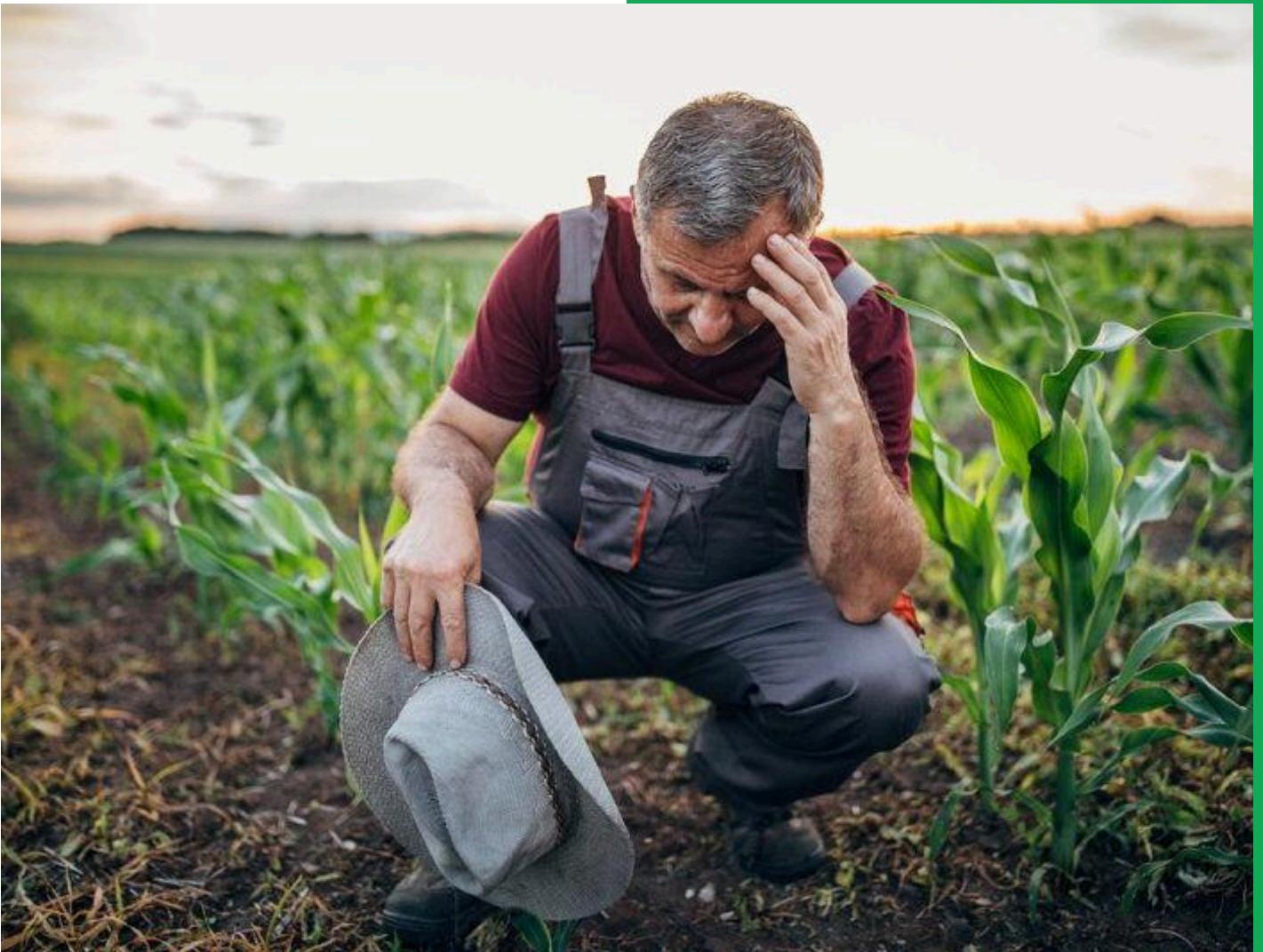
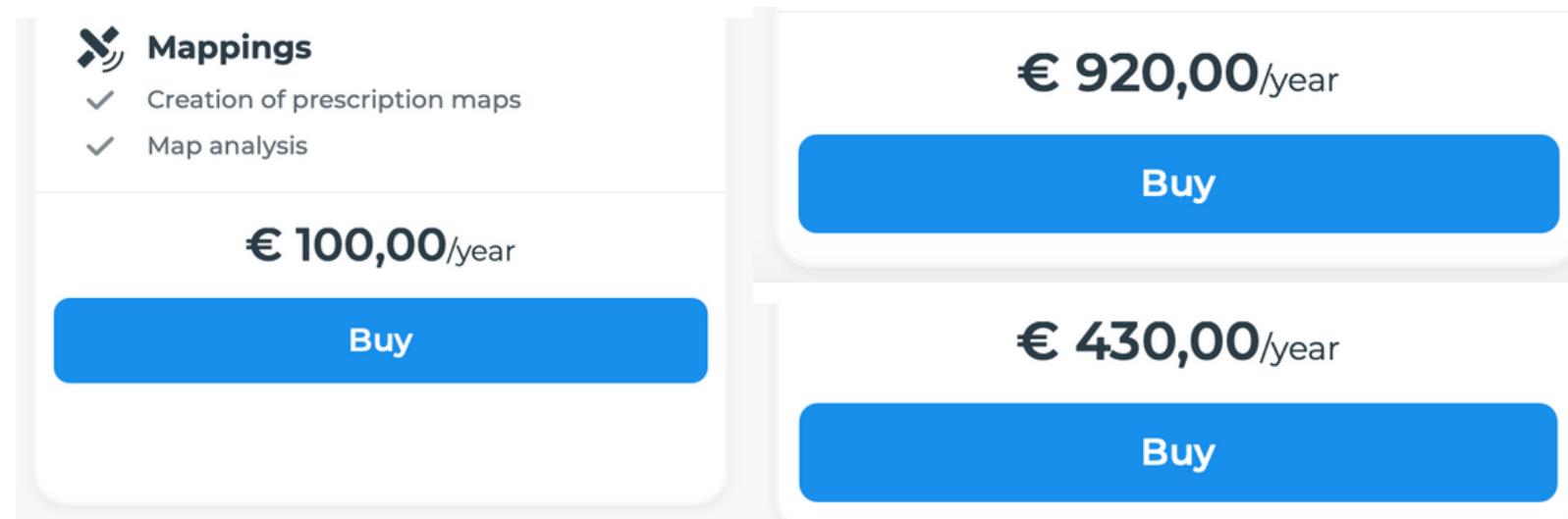
- Water scarcity affects 40% of the global population (FAO).
- 65% of farmers lack access to timely water data (IWMI).
- 70% of farmers find it hard to adapt to new technological practices (Agricultural Systems).
- Water stress causes 30% of crop losses from pests (Global Crop Diversity Trust).
- Climate change leads to increased droughts and floods (IPCC).
- U.S. agriculture loses **\$8 Billion** annually due to drought (NOAA).



Issues with Existing Solutions

Expensive

- Current water management technologies are expensive
- Hardware-intensive.
- Require manual labour deployment to fields



Inaccessible

“Farmers Struggle with Data Management: 62% Lack Reliance on Digital Systems” - Farm Journal

“Farmers Struggle to Utilize Precision Agriculture Data Beyond Basic Yield Maps” - Future Farmers

“Limited Adoption of Advanced AgTech: Only 27% of U.S. Farms Use Precision Practices” - GAO

What is Farmalytics?



Farmalitics is a real-time, satellite-driven platform that empowers farmers with water management insights—helping them mitigate contamination risks, optimize irrigation, and protect their crops, all from an easy-to-use dashboard.

- Runoff Management
- Groundwater Monitoring
- Irrigation Scheduling
- Water
 - Contamination Risk
 - Usage Optimization
 - Logging Detection

But Why Us?

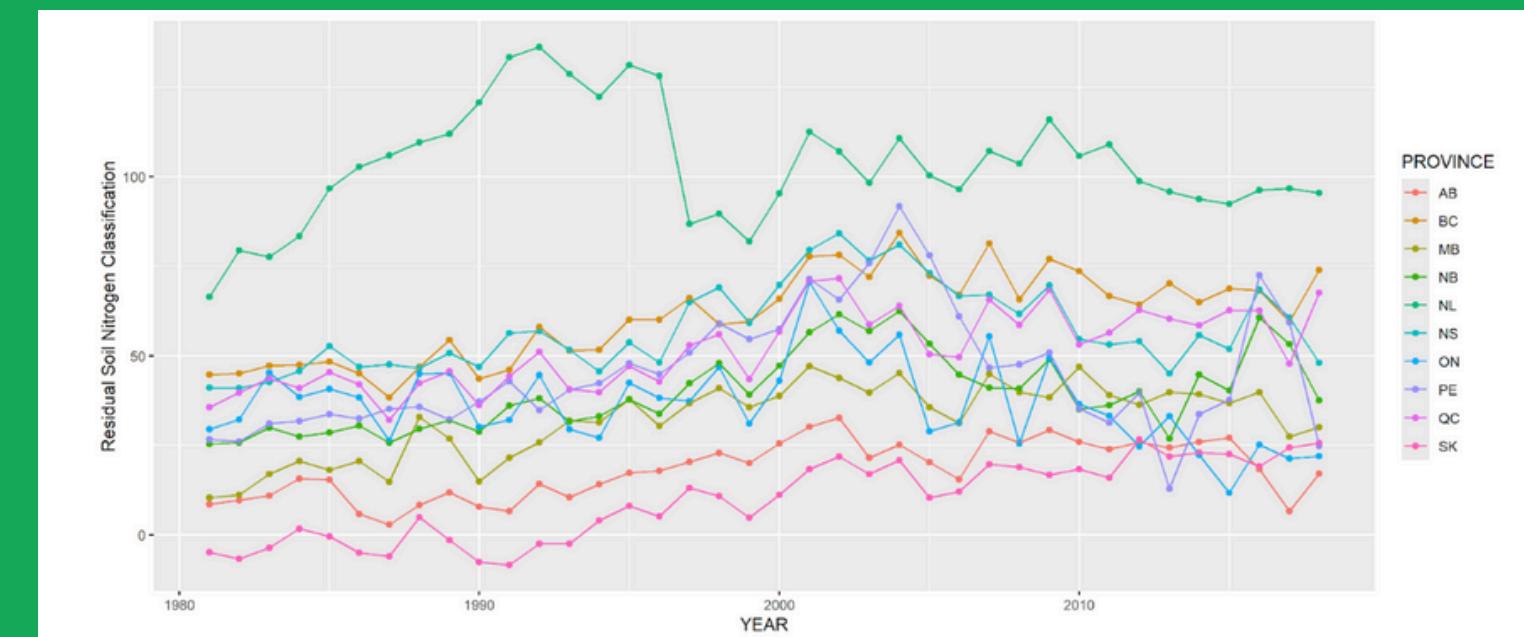
- No Dependency on hardware.
- No on-site deployment.
- No Software Installation needed.
- Satellite Driven Insights.
- More affordable.

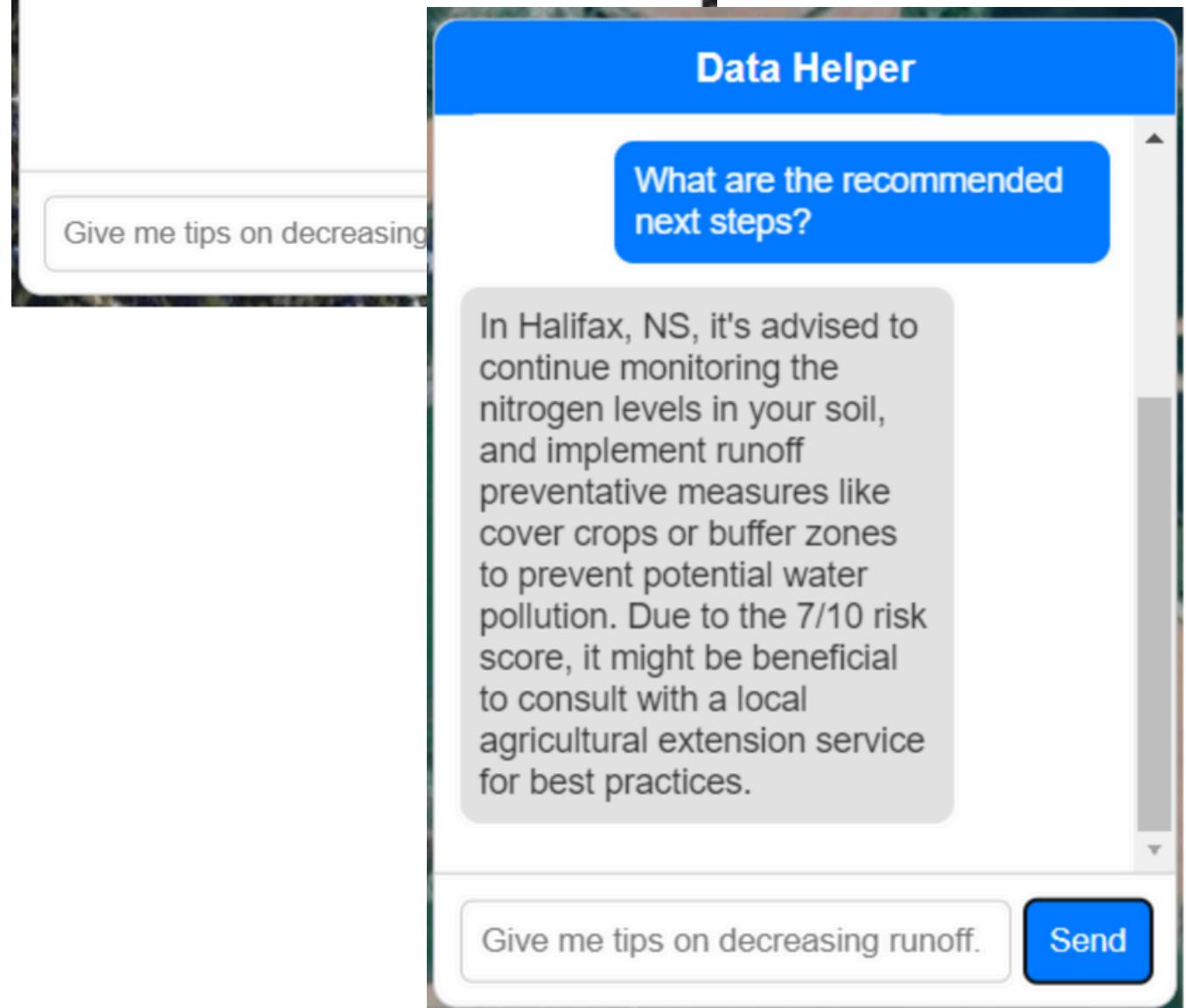
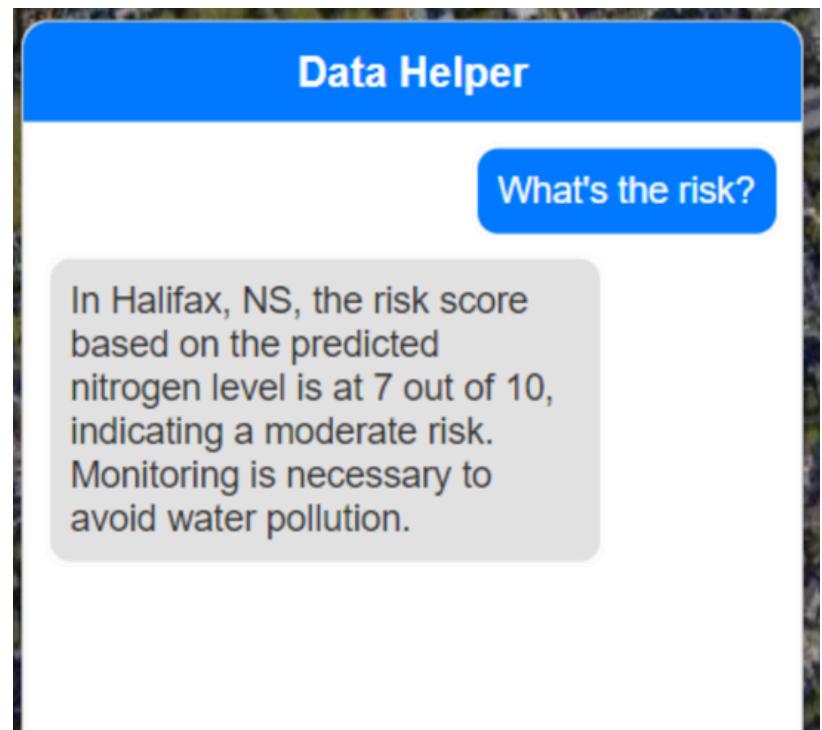
ACCESSIBLE. AFFORDABLE. DATA-DRIVEN.



OKM GeoSeeker |
Water Detector
down to 250m
(820 ft)

\$15,598.82
US\$11,490.00
OKM Americas





What our platform provide to farmers?



- Uses satellite data to calculate a detailed risk score based on satellite data
- Farmers anticipate potential threats to crops and improve water management.



- NLP translates data insights into easy-to-understand, actionable next steps.
- Farmers receive customized advice for managing water effectively based on their soil's risk score.

How it works?

- **Gathered farmer-specific data** like crop type, farm area, and farm type, along with GPS-based location data.
- **Extracted relevant data from NASA portals** for the specific location, then preprocessed and feature-engineered it.
- **Trained an XGBoost model** to predict nitrogen levels; in the future, the model can be expanded to include multiple variables for more precise predictions.
- **Added a map layer to visualize the prediction outcomes**, making it easier for farmers to interpret the data.

```
17  
18 # Train the model  
19 model.fit(X_train, y_train)  
20  
21 # Make predictions on the test set  
22 y_pred = model.predict(X_test)  
23  
24 # Evaluate the model using R2 score  
25 r2 = r2_score(y_test, y_pred)  
26 #print("R2 Score:", r2)  
27  
28 # Prepare data for prediction for 2025 (assuming you have feature  
29 # Replace with your actual data for 2025  
30 X_2025 = pd.DataFrame({'YEAR': [2025], 'LATITUDE': [0], 'LONGITU  
31 X_2025 = pd.get_dummies(X_2025, dummy_na=True)  
32 X_2025 = X_2025.reindex(columns=X.columns, fill_value=0)  
33  
34 # Predict RSN_VAL for 2025  
35 prediction_2025 = model.predict(X_2025)  
36 print("Predicted Nitrogen for 2025:", prediction_2025)
```

Predicted Nitrogen for 2025: [35.428436]

