

# AI for Agriculture: Predicting Water Scarcity and Crop Failure

In a world grappling with climate change, securing our food supply is paramount. Our AI-driven system is designed to empower farmers and policymakers with critical foresight, mitigating agricultural risks and fostering resilience in the face of water scarcity.



# The Growing Challenge: Unpredictable Water Resources



## Drought Conditions

Farmers often receive late or inadequate warnings about impending droughts, leading to devastating crop losses.



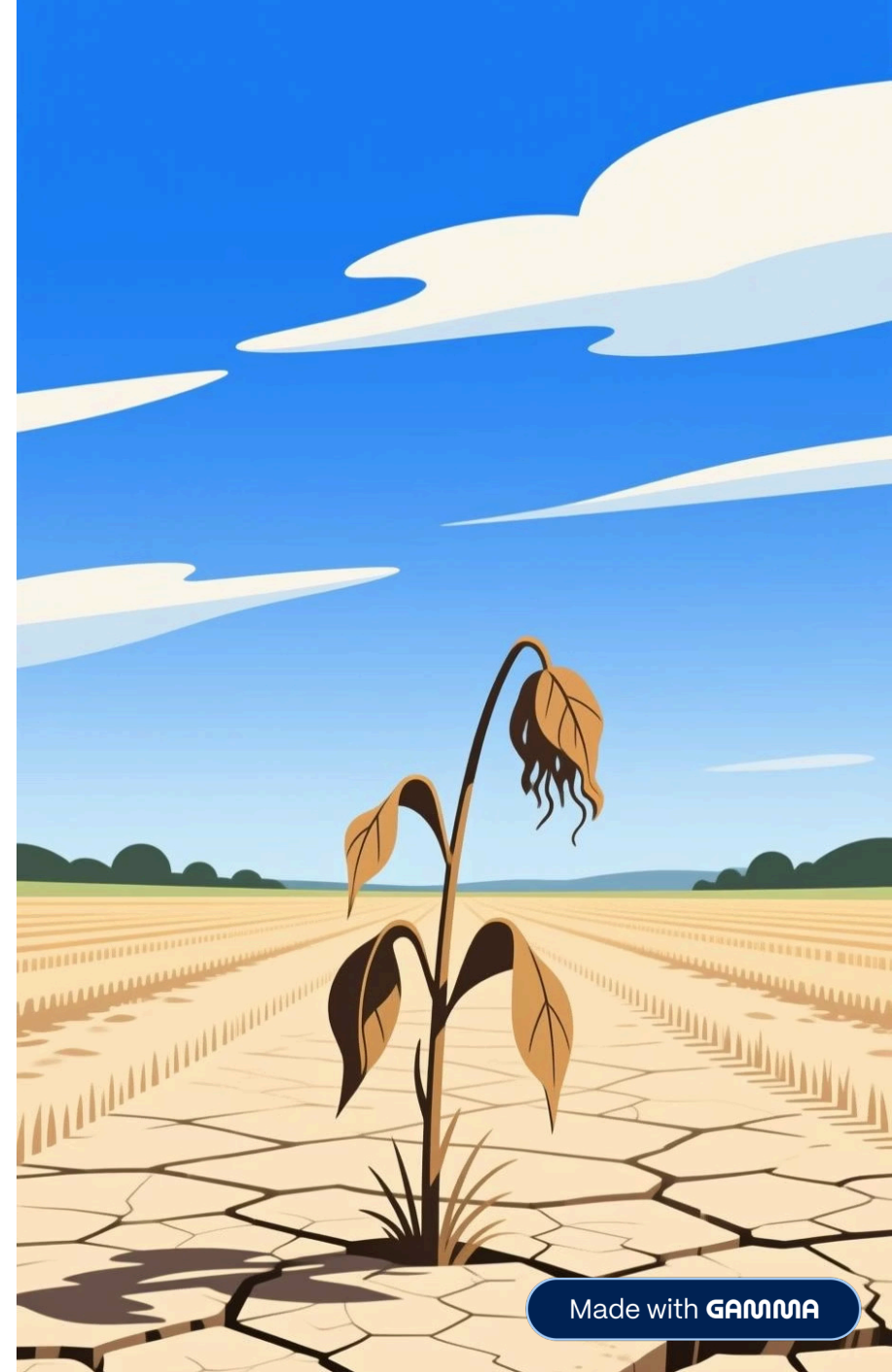
## Depleting Groundwater

Invisible threats like rapidly declining groundwater levels remain undetected until it's too late for intervention.



## Erratic Rainfall

Unpredictable rainfall patterns, whether too little or too much, directly impact crop health and yield.



# The Dire Consequences: Financial Losses and Food Insecurity

The lack of early warning systems translates into significant financial setbacks for farmers. Without timely information, they cannot adapt, resulting in failed harvests and substantial income loss.

- Reduced crop yields
- Increased debt burden
- Loss of livelihood
- Supply chain disruptions

Ultimately, this impacts national food security and economic stability. Our solution aims to reverse this trend by providing actionable insights.





## Our Innovative AI-Powered Solution

We have developed an AI-driven dashboard that acts as an early warning system, leveraging advanced analytics to predict water scarcity and crop failure risks.





## Data-Driven Predictions: Understanding the Inputs



### Rainfall Data

Historical and real-time precipitation patterns analysed for localised accuracy.



### Groundwater Levels

Sub-surface water data integrated for a comprehensive understanding of water availability.



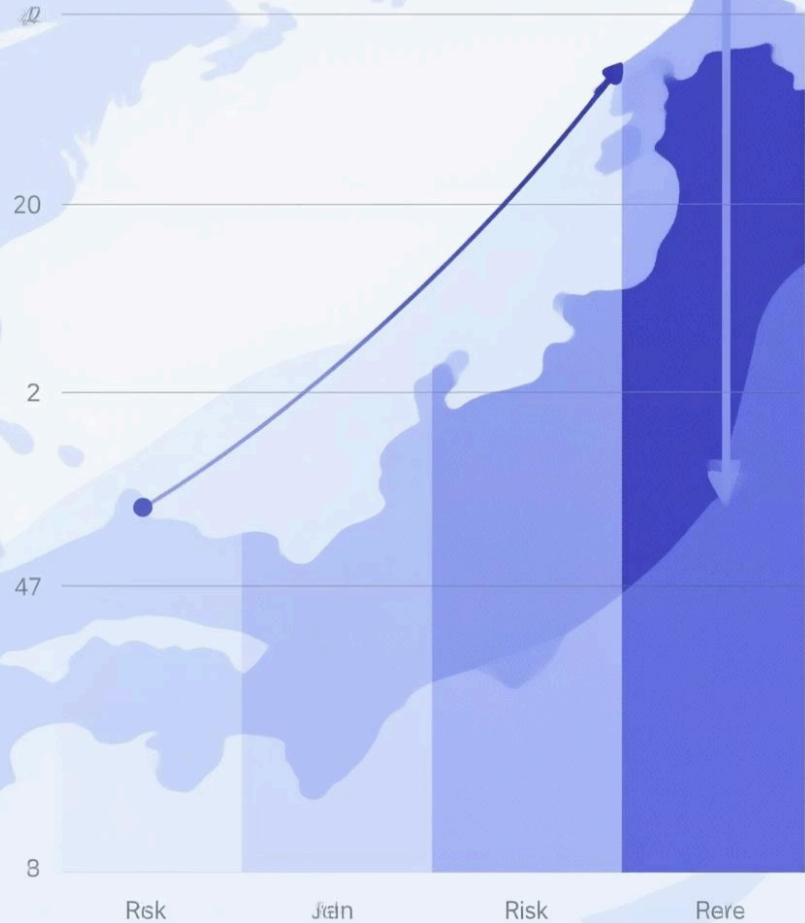
### Past Crop History

Agronomic data and yield records are used to establish regional crop resilience baselines.

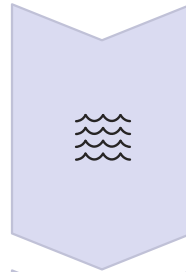
# Flood Risk

## Water Scarcity Crop Failure

- Risk Whistles
- Whistle Trough



## Critical Insights: Predicting Risk and Probability



### Water Scarcity Risk

Predictive analytics identify areas at high risk of water shortages, giving farmers time to prepare.



### Crop Failure Probability

Forecasts of potential crop failure rates, allowing for proactive measures and alternative planning.



# Actionable Recommendations for Resilience



## Alternate Crop Suggestions

Recommendations for drought-resistant or less water-intensive crops suited to predicted conditions.



## Optimised Drip Irrigation

Guidance on efficient irrigation techniques to conserve water and maximise yield.



## Relevant Government Schemes

Information on available subsidies and support programmes for farmers facing adversity.



# Robust Technology Underpinning Our Solution

Our system is built on a foundation of modern, scalable technologies to ensure accuracy and accessibility.

## Python & Machine Learning

Leveraging powerful ML algorithms for predictive modelling and data analysis.

## React Dashboard

An intuitive and responsive user interface for easy access to critical insights and recommendations.

## Government Open Data APIs

Integration with public data sources ensures comprehensive and up-to-date information.

## Firebase Backend

Secure and scalable cloud infrastructure for data storage and real-time updates.





# Why Our AI System is a Game Changer



## Focus on Climate Resilience

Directly addresses the urgent agricultural challenges posed by climate change impacts.



## High Policy-Level Impact

Empowers policymakers with data to formulate effective agricultural and water management strategies.



## Data Science at its Core

A robust, data-driven approach ensures accuracy, reliability, and actionable intelligence for users.

# Paving the Way for a Sustainable Agricultural Future

Our AI Water Scarcity and Crop Failure Prediction System is not just a tool; it's a commitment to a more secure and sustainable agricultural future. By equipping stakeholders with crucial insights, we can collectively build resilience against environmental uncertainties.

**Join us in transforming agriculture through intelligent foresight.**

