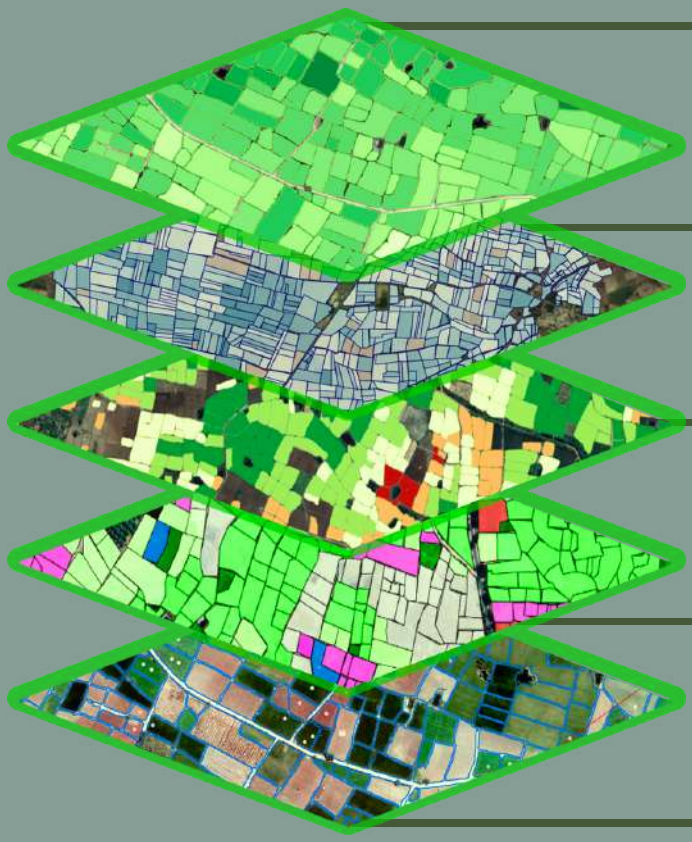
field™ WISE

Transforming Agriculture with Climate Change Adaptation at Every Crop Field

MIT Alumni Developed Technology

Vassar LABS

GIS Dashboards for Field Level Decision Support



Crop Field Risk Profile

AI and ML models help to track climatic risks in real-time.

Irrigation stress

Determine soil moisture and if a crop is under critical stress

Crop Health

Crop health assessment at field level using GIS

Crop Detection

Satellite data and AI/ML algorithms to differentiate and classify crops

Crop Field Detection

Identify farm boundaries through AI and satellite data

Advisories at Field Level

- Sowing Advisories
- Input Advisories
- Crop Stress Advisories
- Pest and Disease Alerts

Key **Features**

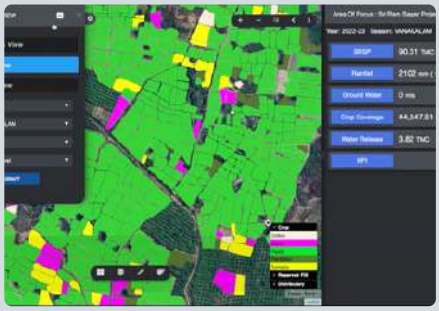
Weather Proof Smart Farming

Crop Field Boundary Detection

AI-based field boundary detection provides visibility from the country level to individual farms empowering decision support and insights on crop sown, pest alerts, crop stress, agro-climatic zone plan, soil health, weather forecast and crop success parameters.

Weather Smart Sowing Advisories

Identify the right crop to sow based on agro-climate zone planning and water availability to reduce the risk of climate change while improving yields and farmer's income. Agro-climatic zone planning helps in identifying and understanding the suitability of different crops in specific regions based on their climate and soil conditions.



Crop Detection and Classification

The system leverages satellite data and AI/ML algorithms to accurately detect crops sown and classify crops within individual fields, offering granular information for precise analysis. Intuitive visualizations, maps, and graphs will display the crop distribution and changes over time, allowing users to gain valuable insights from the data. This module also uses a mobile camera to identify crops sown with an inbuilt AI app, further reducing the time to get field data and eliminating manual errors.

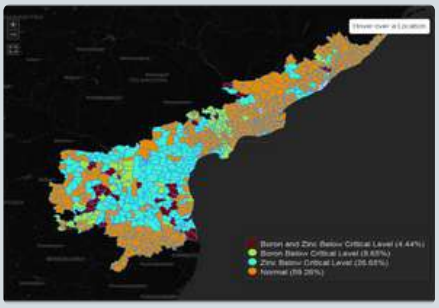
Input Management

Tailored recommendations and informed decision-making for efficient crop production. The crop input management covers crucial information about crop-wise/variety-wise input requirements, such as seeds, fertilizers, pesticides, and irrigation schedules. It also includes data on soil preparation, planting techniques, crop protection measures, and post-harvest practices.

"Ready off-the-shelf configured satellite data, weather data and crop models"

Crop Health Monitoring

Provides near real-time crop health assessment at the field level, offering insights into crop risks and growth indicators. By analyzing satellite images and extracting relevant information related to crop health, chlorophyll content, water content, and other growth indicators, the system will enable farmers to take proactive measures to mitigate potential crop losses.



Soil Health and Soil Moisture

Advisories on soil nutrient levels and current fertilizer consumption, enabling in-depth analysis to assess productivity impact. Additionally, the system generates advisories on fertilizer indent schedules, ensuring efficient management of fertilizer usage. The dashboard also offers soil moisture information for the area of interest, utilizing various national and global datasets on soil moisture to provide detailed statistics

Irrigation Monitoring

The system monitors rainfed areas and soil moisture to estimate crop stress and generate irrigation advisories for maximising crop success. It is also capable of providing real-time monitoring of canal and command area, assessing irrigation to improve water use efficiency ensuring equitable distribution.

Pest and Disease Alerts

This module empowers farmers to make informed decisions about pest and disease management strategies. The system provides crop-wise and growth stage-wise pest and disease Information along with congenital conditions. It enhances farmer's ability to detect early signs of infestations and implement timely remedies to prevent significant crop losses.

"Harvesting Success Through Climate Change Adaptation"

Farm Risk Monitoring

The crop loss assessment dashboard will empower stakeholders with valuable insights into crop loss caused by extreme weather events. The dashboard will utilize crop-wise damage area and historical average (up to the past 10 years) yield to compute the total loss of production. The integration of remote sensing technology and AI/ML capabilities will enhance accuracy and efficiency in assessing crop loss, enabling timely response and support measures to mitigate the impact of adverse weather conditions on agriculture.

Yield Estimation

Web-GIS-based Agriculture System aimed at leveraging satellite-based crop monitoring products to identify dominant crops, estimate crop yields, and analyze production flow across multiple administrative regions. The proposed system will utilize historical data and machine learning models to estimate the average yield for available crops, including major crops like paddy, wheat, and maize. It will provide yield estimation at the farm and cluster levels, enable price forecasting, and aid in making informed decisions for improved agricultural productivity.

Ease of Use

The platform also comes with features like a GIS portal, Analytics, and Dashboard elements like tables, charts etc, that help in visualizing data using maps and smart widgets to derive actionable insights.

Mobility

The platform empowers field users with mobile capabilities for data collection, report consumption, and ground truthing. Deep learning algorithms analyze images to accurately identify crops, monitor growth, detect diseases, optimize yields, and enable precision agriculture for efficient resource use and sustainability.

Agricultural **Management**

Agro Climatic Crop Zone Planning

Climate Resilient Agriculture Management

fieldWISE

_____fieldWISE is an integrated agriculture platform equipped with a cutting-edge decision support system that leverages technologies like IoT, remote sensing and AI/ML. fieldWISE emerges as the beacon of innovation, offering a comprehensive solution for climate-resilient agriculture.

fieldWISE empowers the agriculture ecosystem towards data-driven decisions to improve crop success rates by monitoring risks and identifying interventions in near real-time in the age of adverse climate change.

Farms produce thousands of data points on the ground daily. With the help of fieldWISE, we can now analyze a variety of things in real-time such as weather conditions, climatic risks, soil moisture, water usage, pests and diseases, crop health and soil conditions.

fieldWISE acts as one authoritative system which is scalable from the farm level to block, district, state and country levels.

fieldWISE runs on an MIT-developed technology that helps us deliver top-tier field level decision support.

- Historical and possible cropping patterns
- Crop-specific water requirement & water balance
- Risk profiling using weather data and crop growth cycle
- Changing weather (Rainfall, Temp, Humidity) Dry Spells & Morning Dew

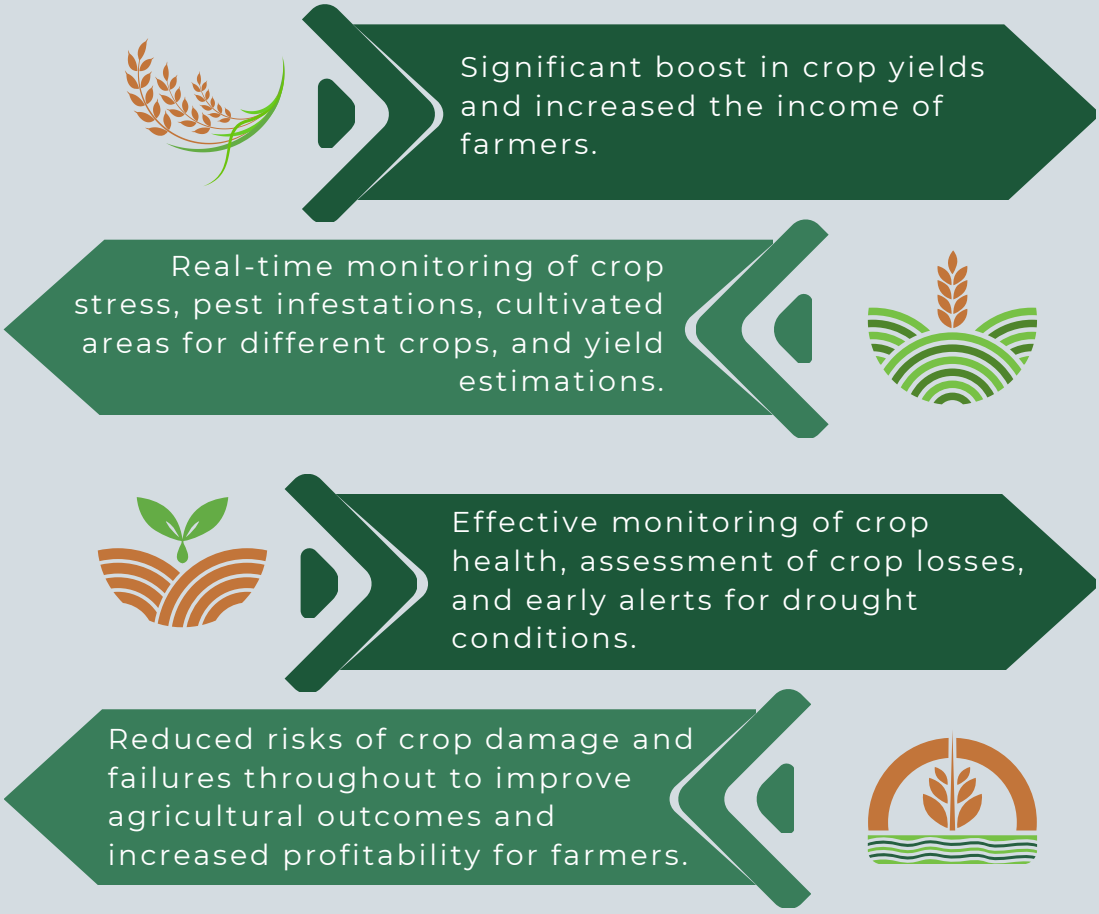
field WISE

Case Study

Andhra Pradesh - Agriculture Information and Management System

fieldWISE, implemented as APAIMS (Andhra Pradesh Agriculture Information and Management Systems), integrates the use of AI, remote sensing, and GIS technologies for farm-level intelligence, enabling data-driven decisions. This specialized solution, customized to suit the distinctive agricultural terrain of Andhra Pradesh, India, covers a vast geographical area spanning 162,970 square kilometres and includes 81 lakh hectares of agricultural land. With a user base of over 8.6 million farmers, APAIMS leverages AI, remote sensing, and GIS to provide accurate and timely information at the individual farm levels, aggregating to the state level for effective agricultural management.

Furthermore, a parallel instance of this system has been successfully deployed in Haryana, catering to the needs of approximately 6.75 million farmers in the state.



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Case Study

Impact **Coverage**

Sowing Advisories

Advisories raised for 10+ crops for 12k + Villages

Groundnut sowing shifted from 2nd fortnight of June to 1st fortnight of July

Pest and Disease Prediction

800k hectares alerted for Pest/Disease

Prevented economic loss due to pink bollworm (cotton) & fall army worm (maize and jowar)

Crop Planning

18k Villages & 10 Million farms covered

Shift seen in low productivity groundnut area to orchards

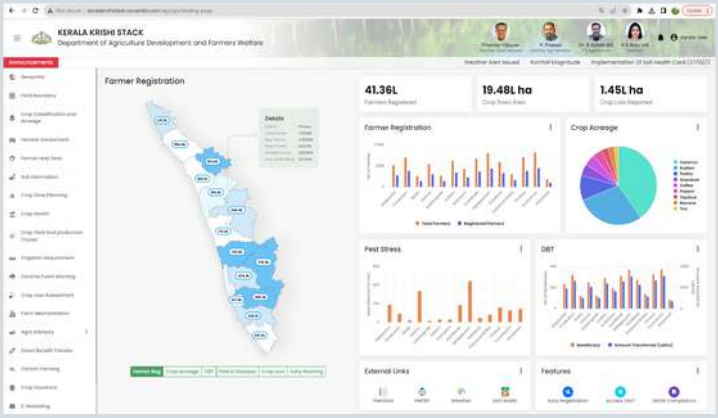
SHC Fertilizer Management

18k Villages Covered across 670 Mandals

7.5% Decrease in use of fertilisers as compared to last year

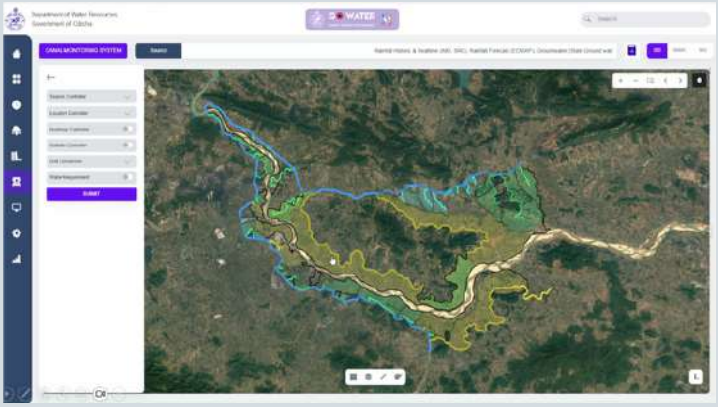
field WISE

Projects



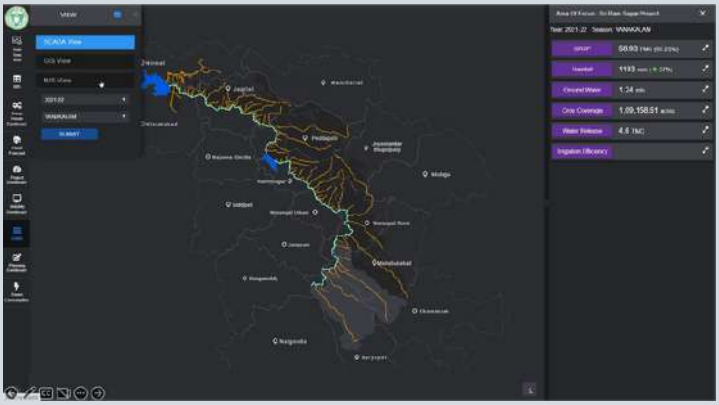
Kerala Krishi Hub

India's first AgriStack with Climate Smart Decision Support to unify state's farm, farmer, and crop data and enhance productivity for crop fields with climate resilient precision farming advisories. The platforms allow crop and field data visibility to Improve yield and reduce fertilizer/pesticide input.



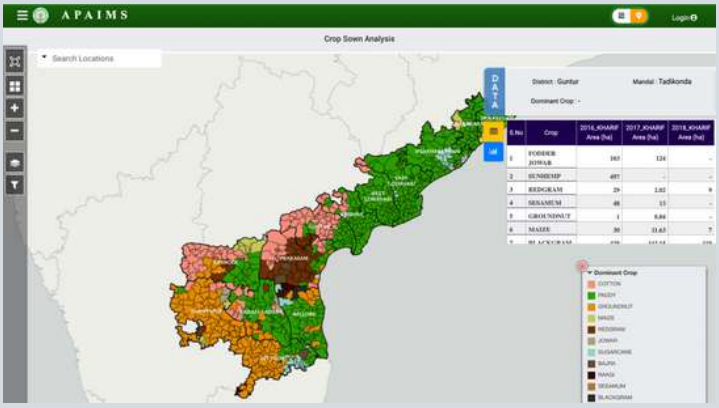
Odisha Command Area Monitoring

A state-wide irrigation planning & monitoring system that helps understand water requirements for the next 10 days along with identifying parts with severe dry spells and water required to save the crop. It helps farms to make decisions on "when to irrigate the fields". It also monitors commands area irrigation schedule and irrigation efficiency.



Telangana Command Area Monitoring

An irrigation planning and monitoring system operates at the basin level, facilitating insights into water needs over the next 10 days. It also pinpoints areas experiencing severe dry spells and calculates the necessary water to preserve crops. It provides demand assessment based on water required for the planned area, actual sown area, water released, remaining water, current groundwater, and rainfall forecast.



Andhra Pradesh Agriculture Information and Management System

India's first data-ready integrated digital farming platform for the state of Andhra Pradesh. The platform unifies weather data and farm data to provide weather smart sowing advisories, pest and disease alerts, and unified visibility of the state's agriculture ecosystem on a GIS dashboard.

fieldWISE

Technology Stack

Using Technologies like AI/ML, IoT, Satellite, and GIS fieldWISE brings in decision support on the farm level. Breaking down large data sets to provide individual farm-level advisories and risk alerts.

Remote Sensing

Readily available high-resolution satellite imagery, optical and microwave data from sources like Sentinel-1 and Sentinel-2 (European Space Agency) along with Landsat and MODIS (NASA) help in Identifying farm boundaries, crop type, crop growth, crop health, drought and flood monitoring.

Artificial Intelligence

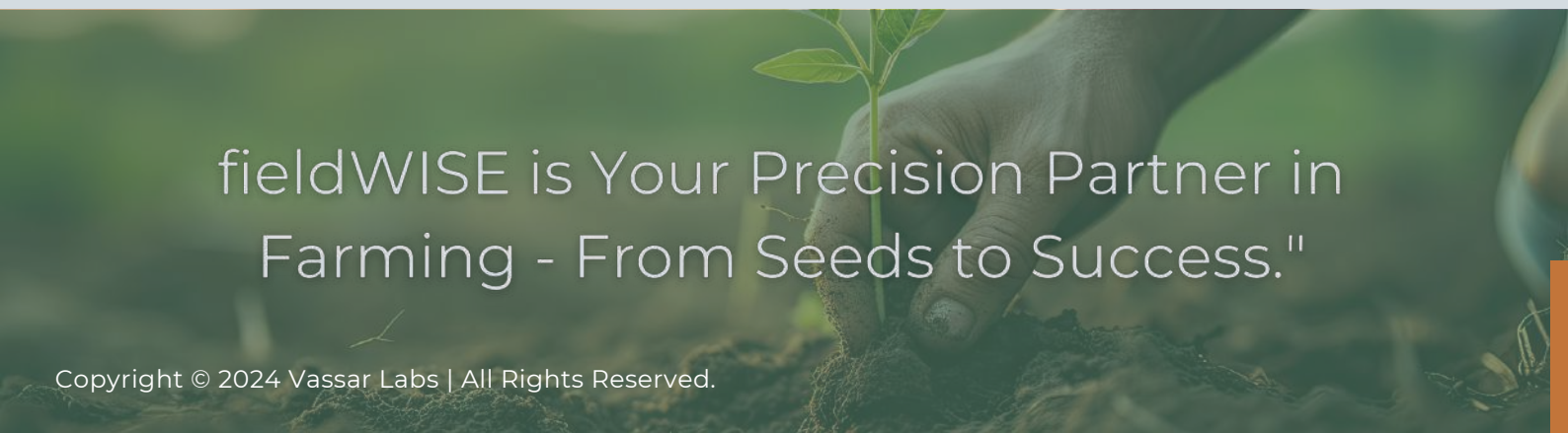
AI/ML algorithms and models analyze the collected data and provide farm-level insights on crop type, pest and disease alerts, climatic risks and soil health.

GIS

GIS helps in visualising data and insights in geospatial form for a better understanding of geographical data.

IOT

IoT sensors monitor key parameters such as soil moisture, temperature, humidity, and crop growth.



fieldwise

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