

Satellite Enabled Risk Mitigation in Agri-Financing



INSIGHT DRIVEN AGRICULTURE RISK MANAGEMENT,
CREDIT RATING, AGRI LENDING, AND FINANCIAL INCLUSION

WHO ARE WE

“ SatSure is a large area analytics company working towards improving financial inclusion of farmers in the developing world by combining the power of satellite Remote Sensing, IOT, Machine Learning, Cloud computing, and Big Data analytics. ”

DELIVERING NEAR REAL TIME INSIGHTS



SENSOR DATA

Satellites, IOT, Weather,
Drone, Econometric Data



PROPRIETARY IP

Machine Learning Algorithms



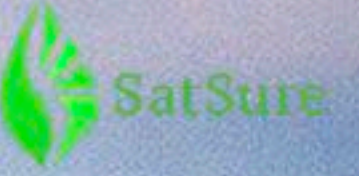
BIG DATA COMPUTING

On Premises and On Cloud

AREAS OF FOCUS



The Objective



Faster loan and credit disbursement and settlement facility to farmers who requests crop or farming loans

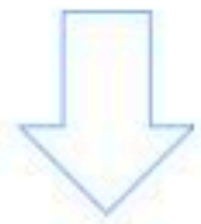


FARM FINANCE SOLUTION

Current Information Gap



IF LOAN AMOUNT WAS USED for CROP INTENDED



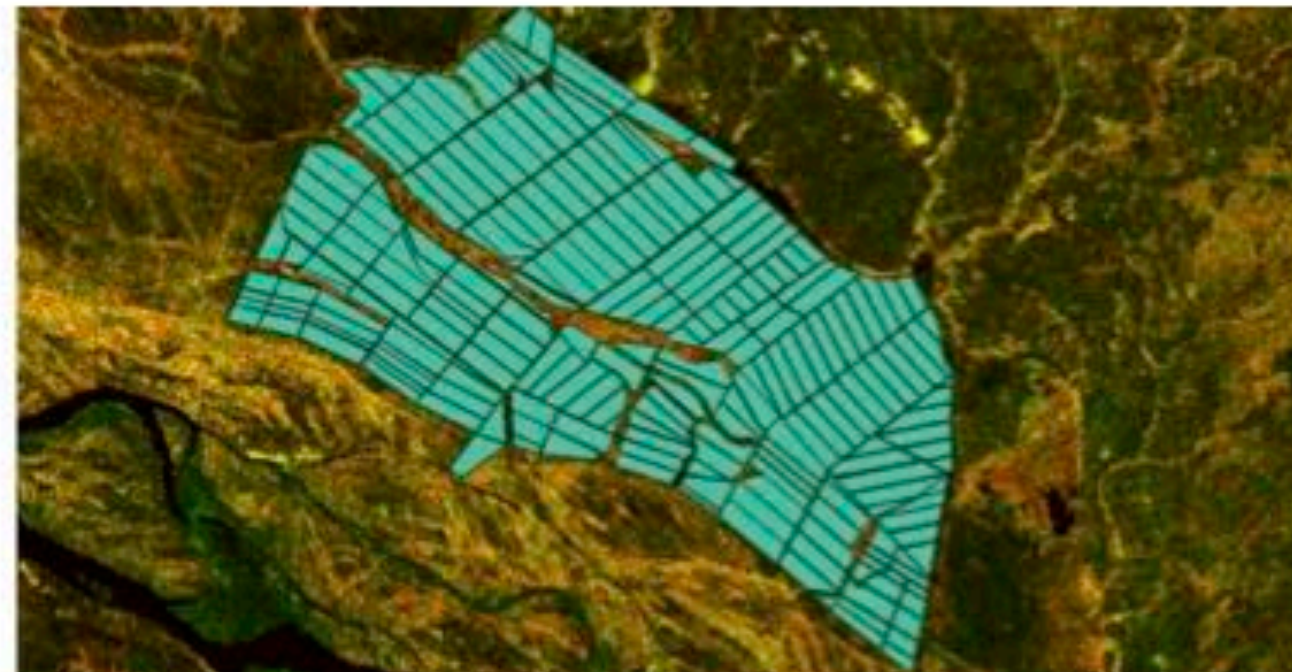
Satellite Image Classification for Crop Identification



If FARMING ACTIVITY is taking place



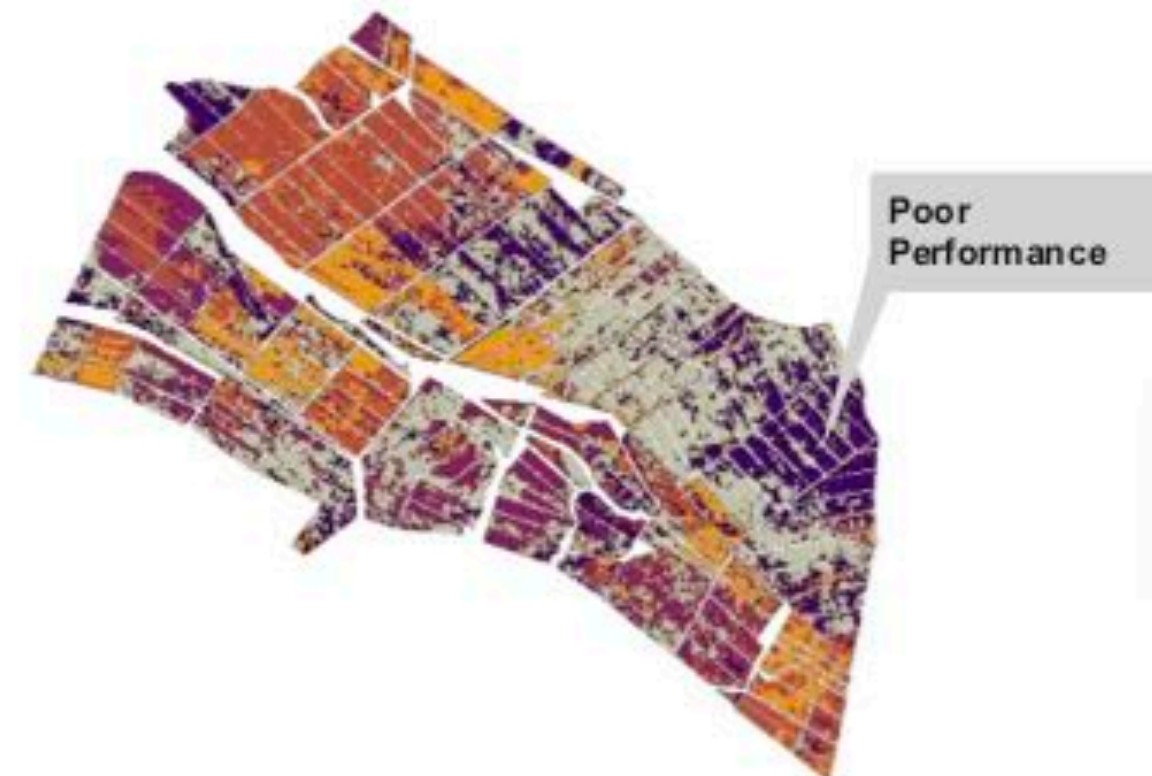
Large Area Monitoring across Growth Cycle



FARM ADVISORY for INTERVENTIONS



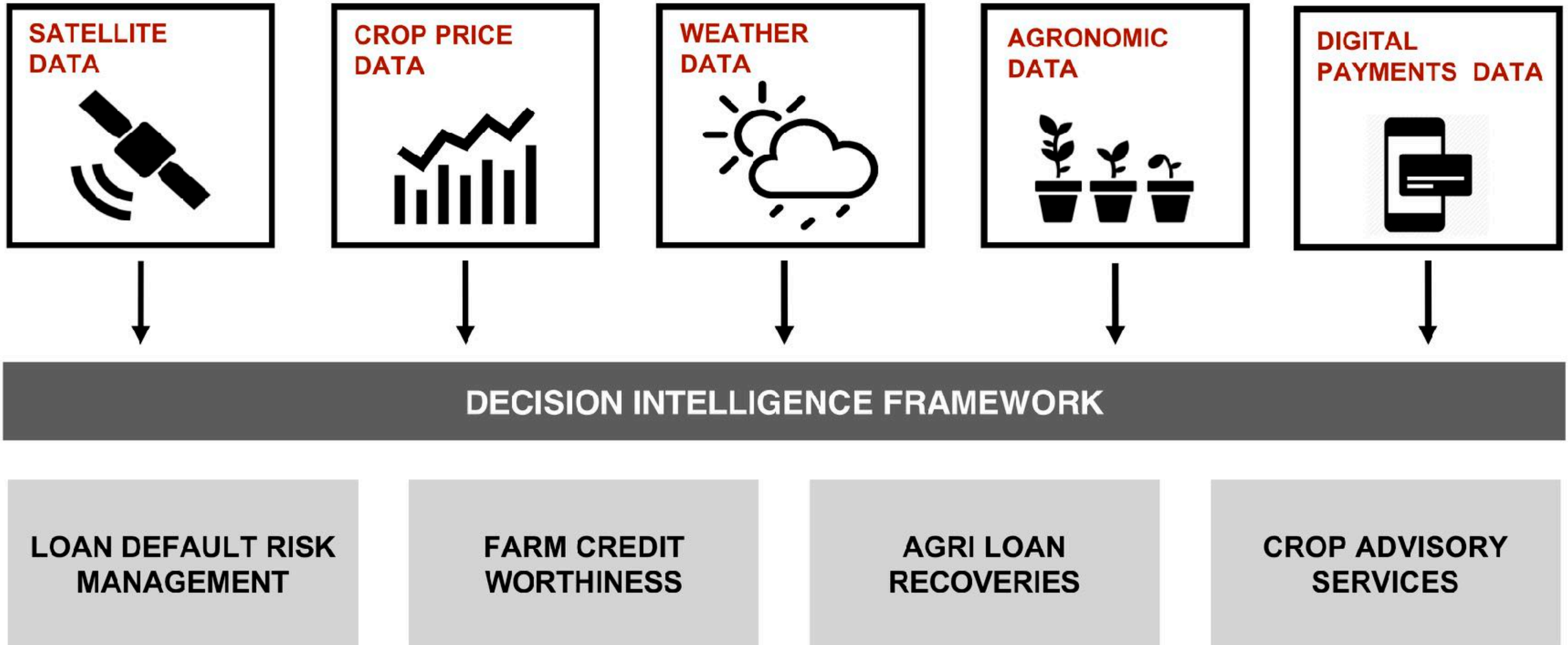
Time-series analysis based Crop Performance



WEATHER for impact and exposure to related loss

NIGERIA PADDY ANALYSIS DEMO

AGRICULTURE LENDING



BASE TECHNOLOGY STACK

GEOSPATIAL ANALYTICS PLATFORM



Satellite Imagery



IoT Sensors



Drone Data



Socio Economic Metrics



Cadastral Land Records



Weather Data



Commodity Price Data



Federal, State Datasets



DATA SYNCHRONISATION MIDDLEWARE



DATA STORE



ANALYTICS



DeepLearning:

REPORTING



HITACHI
Inspire the Next



Pre Loan Grant Default Management



Asset Linkage and Verification to establish default risk



CHECK CADASTRE

against satellite imagery to see if land is not in zoned areas (riverbeds, wetland, revenue land) and verify against digital land records datasets for ROR compliance.



VERIFY HISTORICAL USE OF LAND

to authenticate request and farming history Link to historical datasets of mandi-level support pricing to measure historical crop viability of the farm and farming practice.



CREATE & LINK FARM HEALTH INDEX

based on parameters such as fertilizer usage, weather variance, ground water level etc

LINKED ASSET passed back to Core Banking to create Customer 360 and loan disbursement decision.

Farmer Default Decision and Loan Recovery or waiver decision making.



Post Loan Grant Default Management



Constant Monitoring to establish default risk



LOAN GRANTED
information is passed back to SatSure Platform for periodical monitoring.



LARGE AREA ANALYTICS OF ENCUMBERED PARCELS done via Satellite Data and other data sources on a periodical basis - weekly, bi monthly, monthly basis to check on:



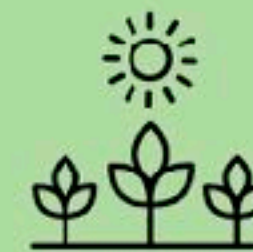
IF LOAN AMOUNT WAS USED to buy seeds, and farm was sowed.



IF FARMING ACTIVITY is taking place to claims of farming



WEATHER for impact of crop in encumbered land and exposure due to extreme weather situations

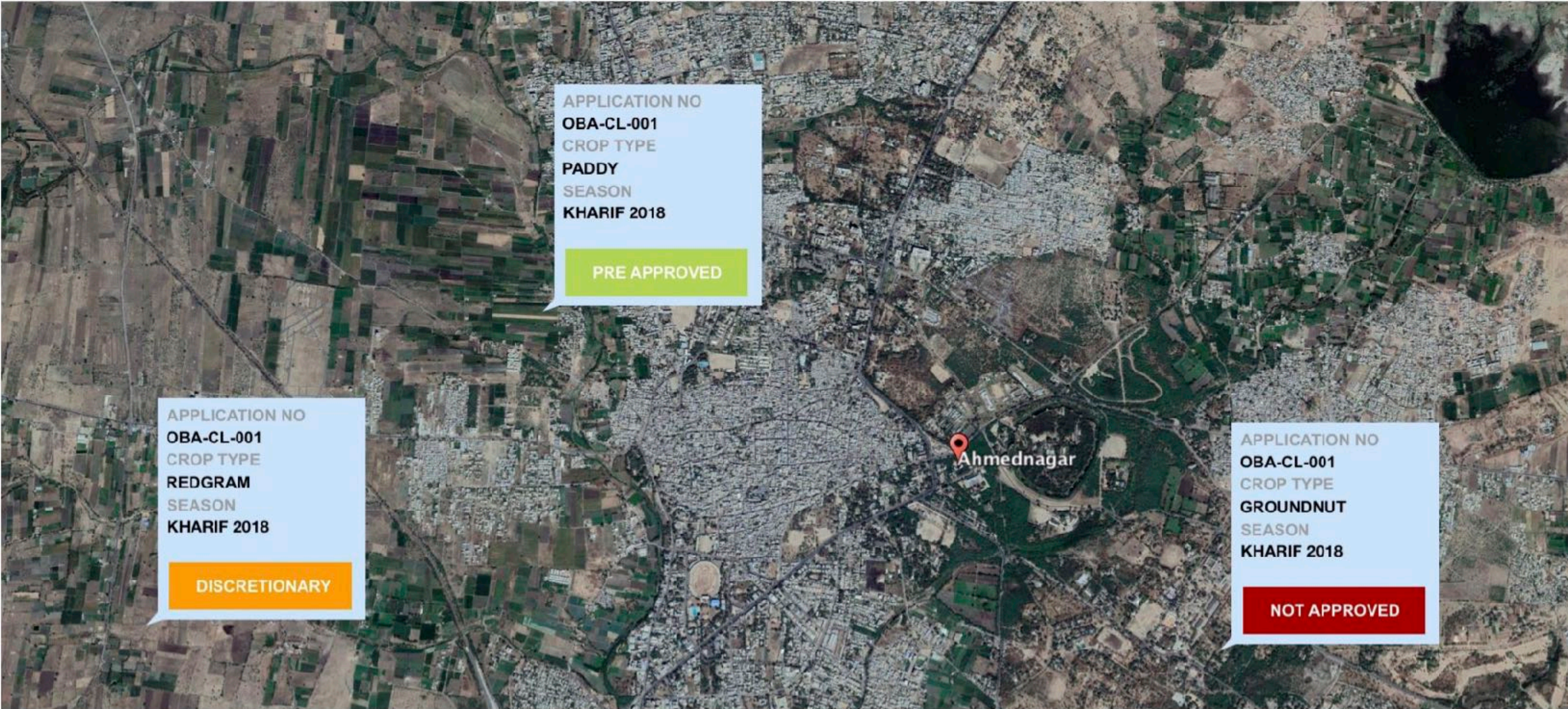


Whether CROP GROWTH is viable, failure and harvest readiness triggers for **LOAN FACILITY CLOSURE / RECOVERY**



AGRI LOAN PORTFOLIO MONITORING

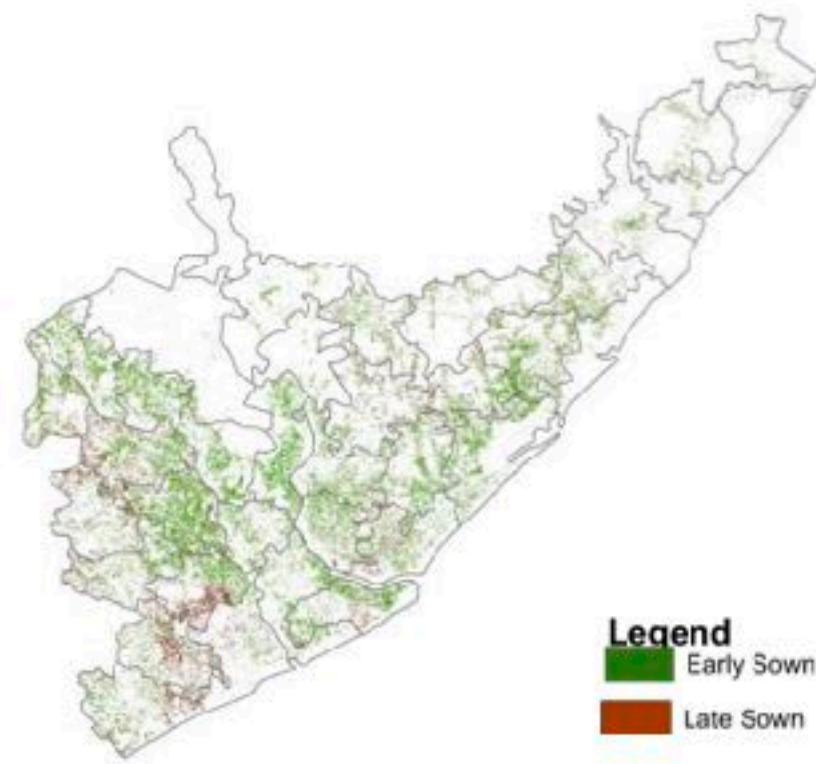
LOAN OFFICER DASHBOARD - APPROVAL QUEUE MAP VIEW



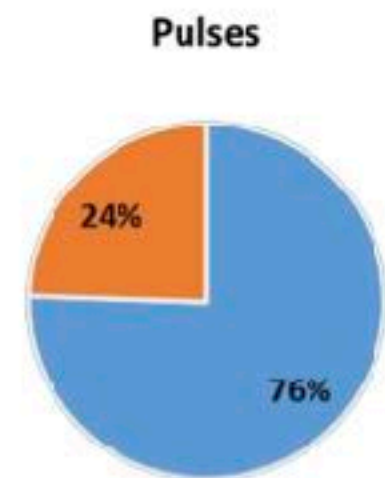
CROP INTELLIGENCE PRODUCTS



SOWING INTELLIGENCE

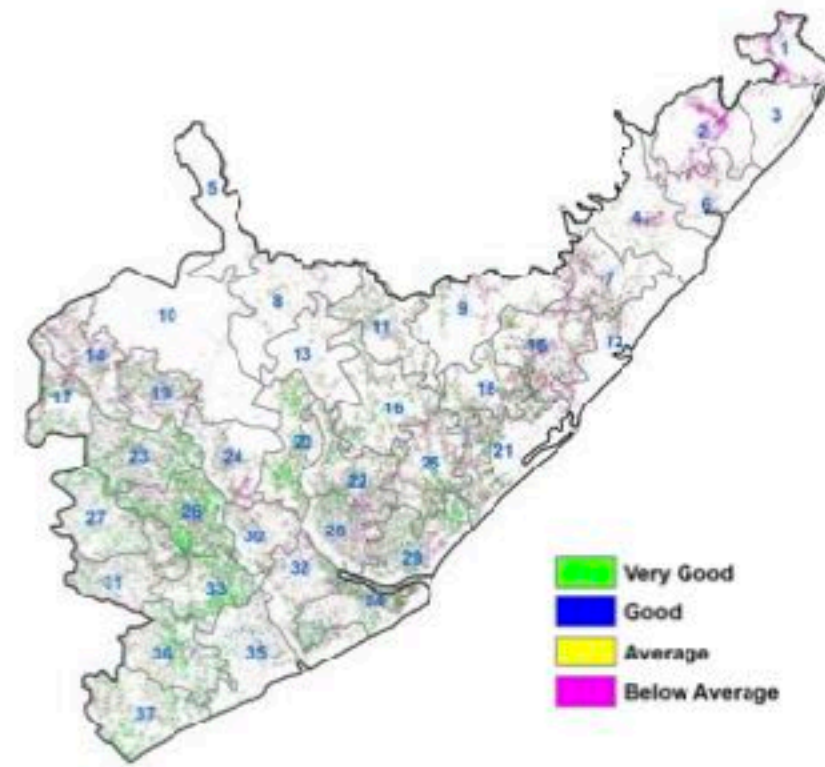


Legend
■ Early Sown
■ Late Sown

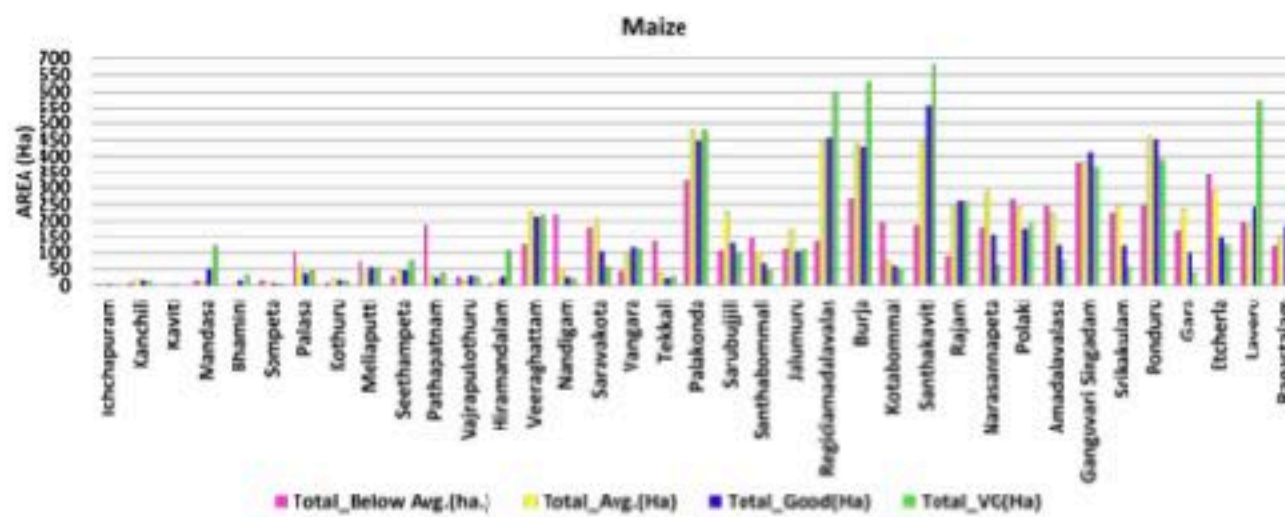


■ Early Sowing (in hectares) ■ Late Sowing (in hectares)

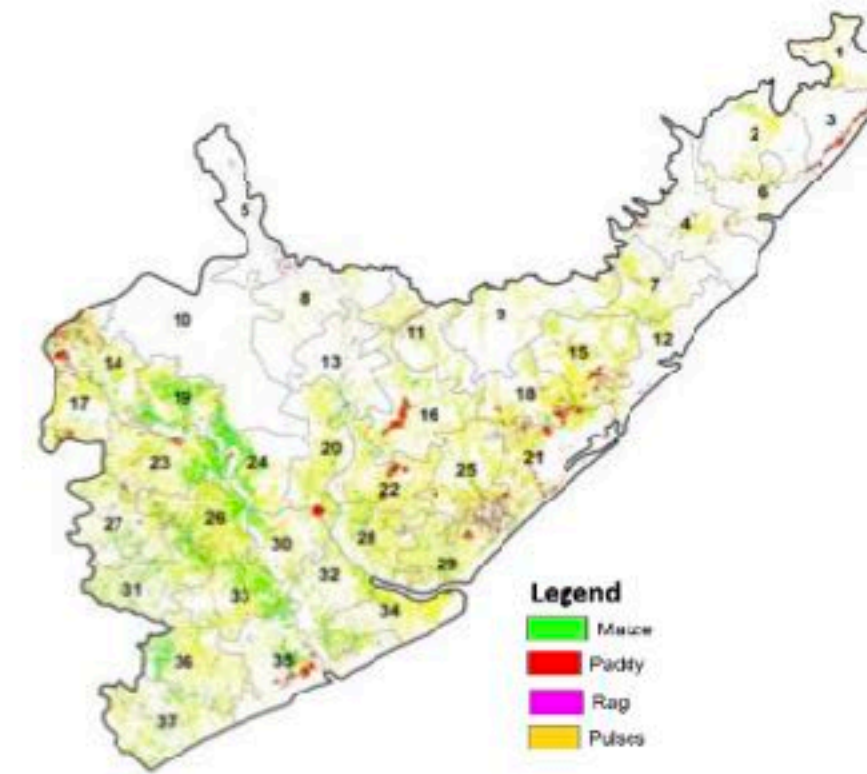
CROP CONDITION MONITORING



Legend
■ Very Good
■ Good
■ Average
■ Below Average



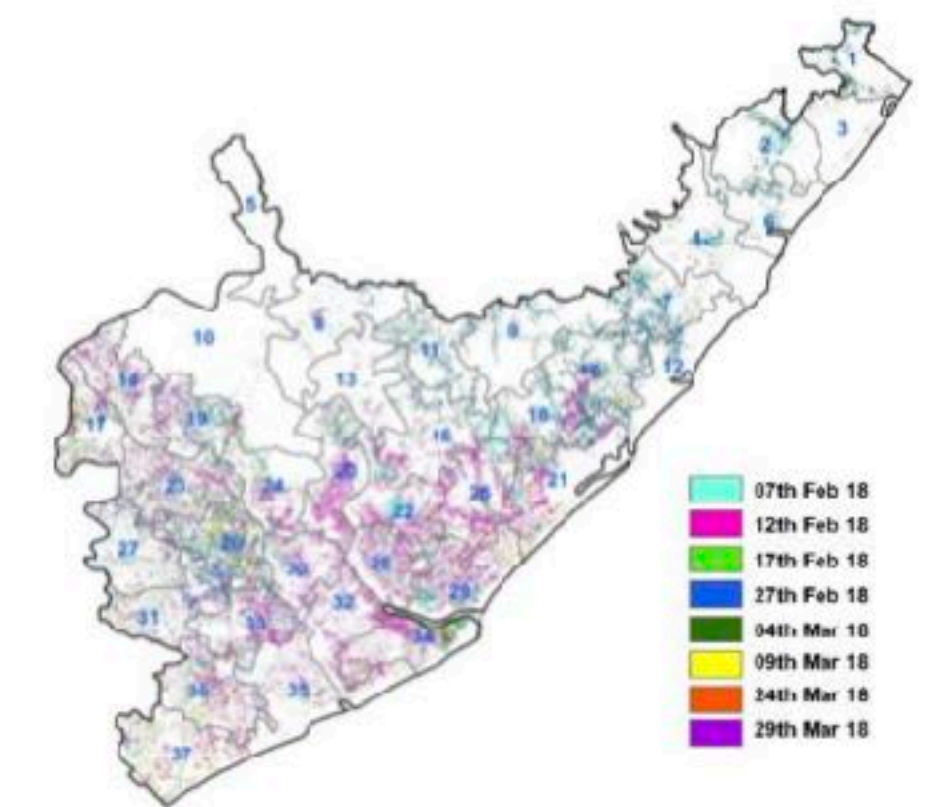
ACREAGE MONITORING



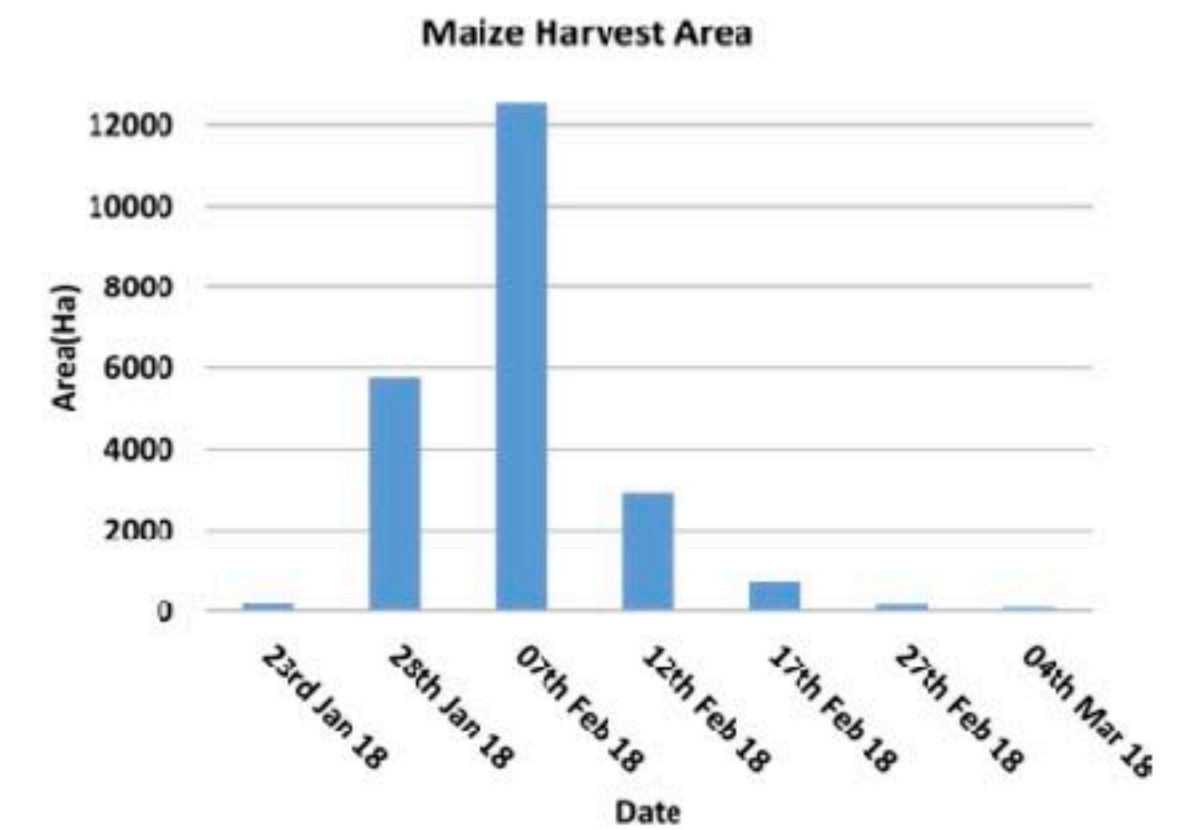
Legend
■ Maize
■ Paddy
■ Ragi
■ Pulses

Crops	Area (in hectares) from Remote Sensing Data till 13 th April	Area (in hectares) from Remote Sensing Data till 14 th March	Actual Area (in hectares) (Up to 14/03/2018)
Maize	22,997.48	22,997.48	22,692
Paddy	8,701.85	4082.33	3796
Ragi	4,197.50	4,197.50	4,498
Pulses	93542.06	93542.06	91,310

HARVESTING INTELLIGENCE



Legend
■ 07th Feb 18
■ 12th Feb 18
■ 17th Feb 18
■ 27th Feb 18
■ 04th Mar 18
■ 09th Mar 18
■ 24th Mar 18
■ 29th Mar 18



FARM FINANCE SOLUTION

Improve Credit Linkages



CHECK CADASTRE

Land not in zoned areas
(riverbeds, wetland, etc.)
Verify digital land records
for ROR



HISTORICAL CROP YIELD

Farming history



FARM HEALTH INDEX

Weather variance, fertilizer
usage, ground water, etc



MARKET PRICES

Local mandi prices
Market Access
Global indices



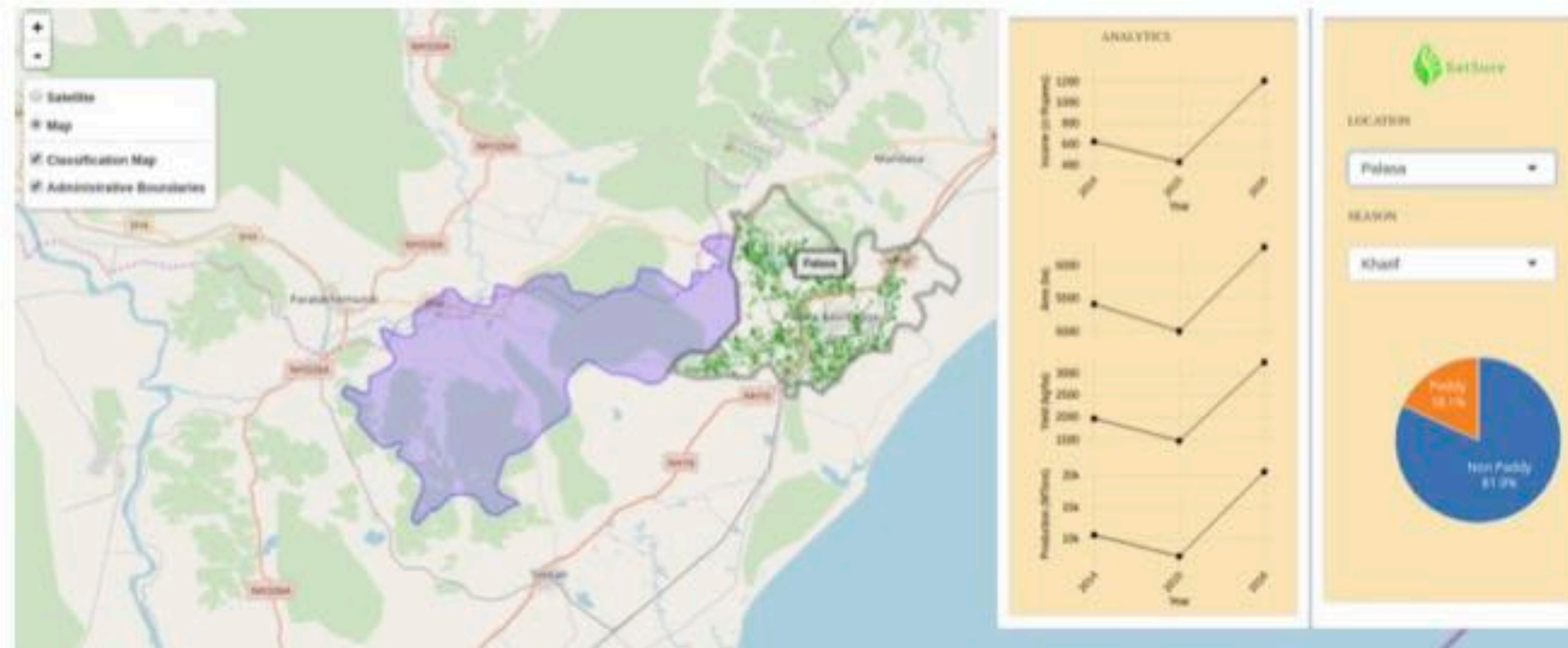
FARM CREDIT WORTHINESS

Payment
histories

Potential Impact:
10s of millions

Target Farm-holdings:
> 1 acre

Delivery Mode:
APIs



Crop Risk – Smart Sampling



SMART SAMPLING OF CROP CUTTING EXPERIMENTS

- Higher accuracy of yield estimates
- Reduce number of CCEs by 80%
- Save approx Rs. 6 Cr per district

Step 1: Crop Classification

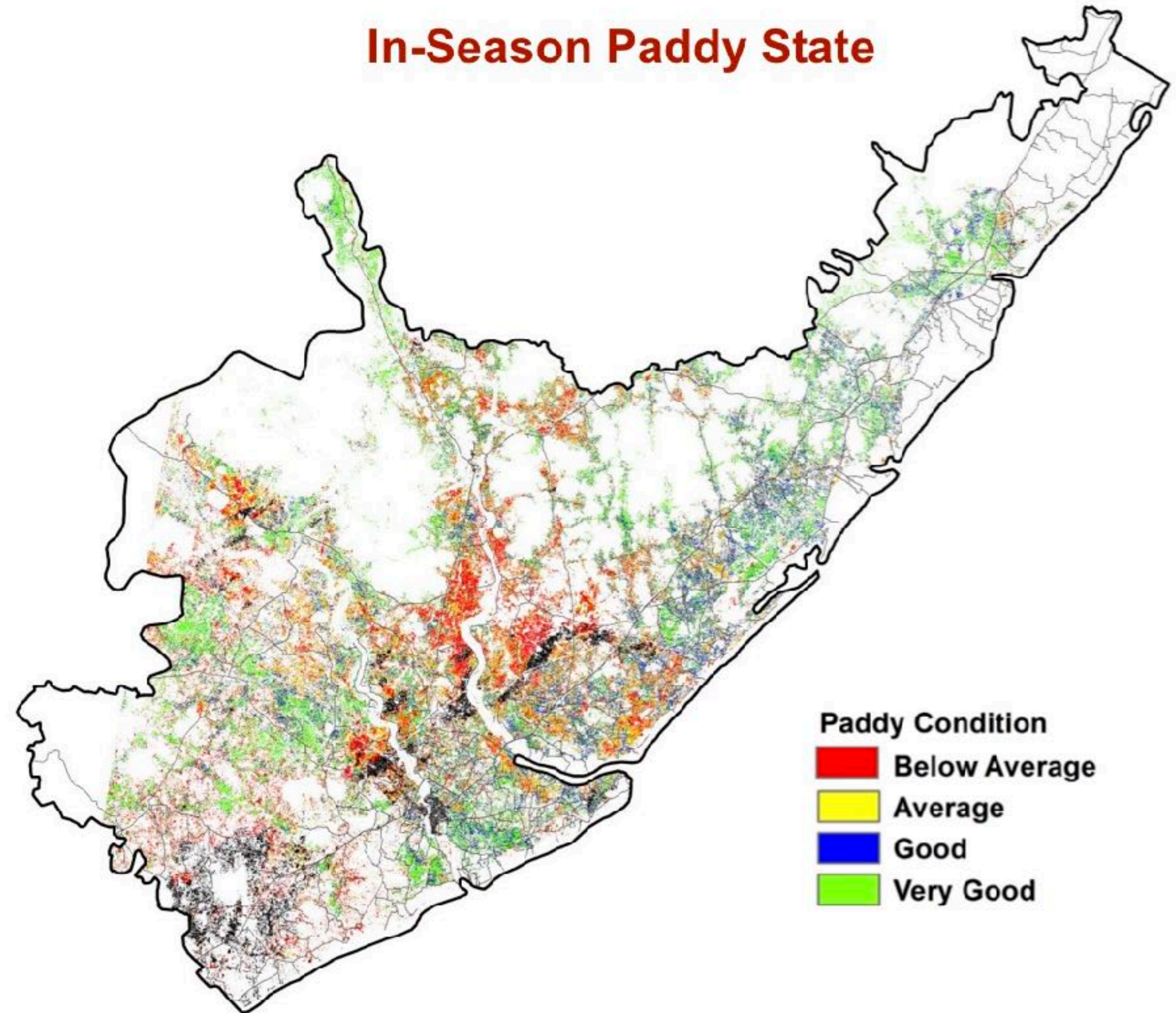
Step 2: Stratify based on Yield variation based on phenology*

Step 3: Re-stratify based on Proximity analysis with road network

Accuracy - 95% (on yield distribution and acreage)

* Identifying yield variations in paddy crop, by capturing its phenology through time-series satellite data, using vegetation indices, for creating a stratified sampling plan for CCEs

In-Season Paddy State

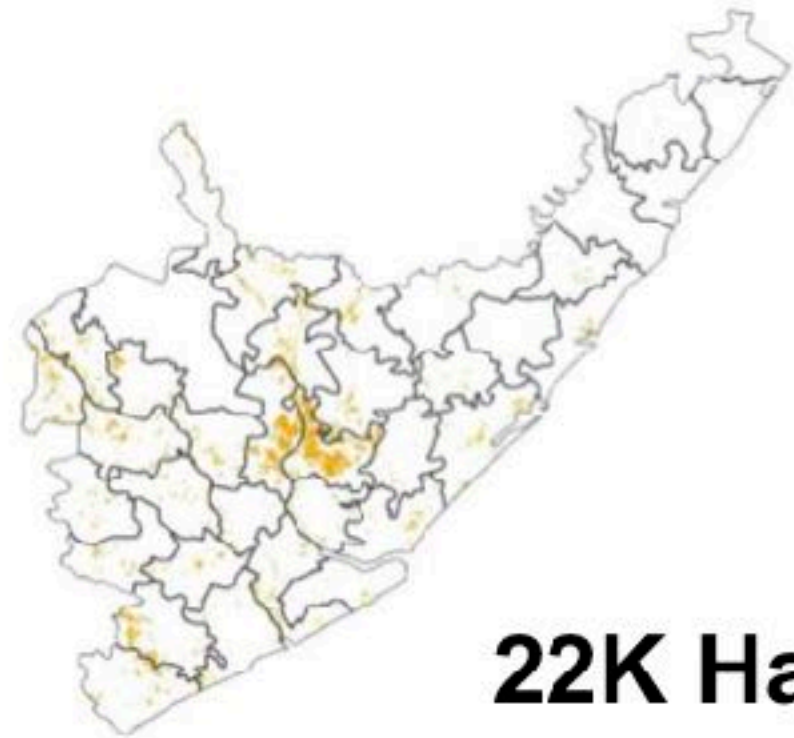


SRIKAKULAM, Kharif 2017

Harvest Progress – Kharif, 2017

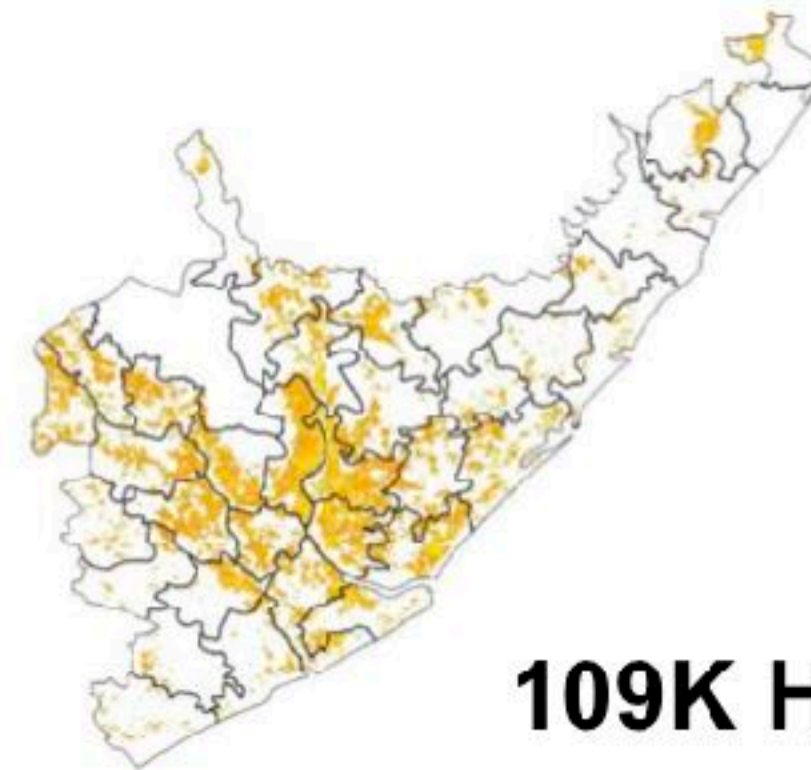


1FN November



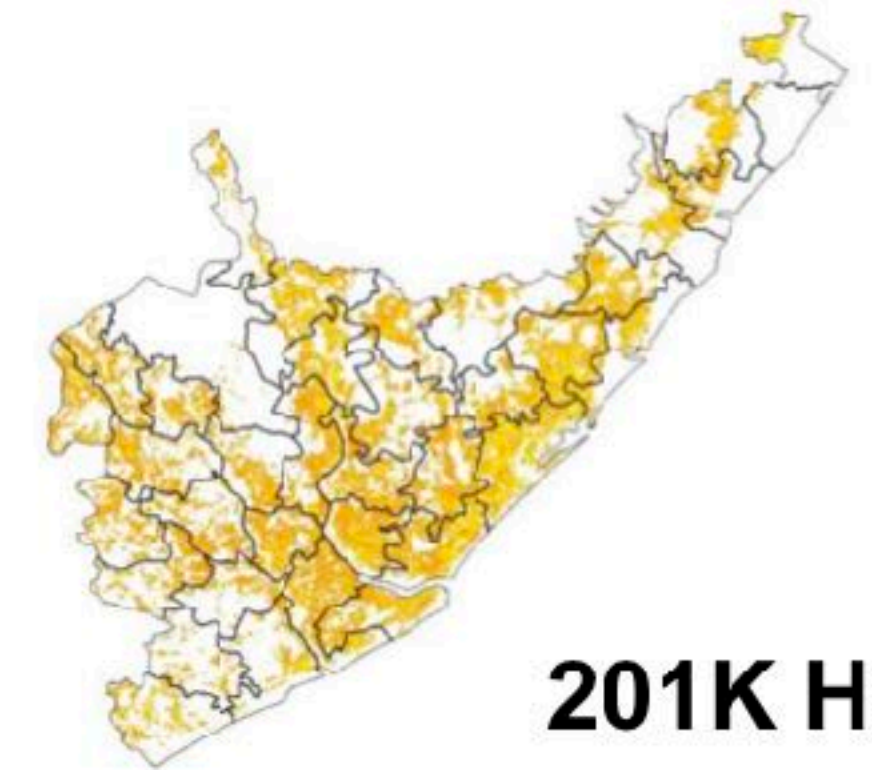
22K Ha

2FN November



109K Ha

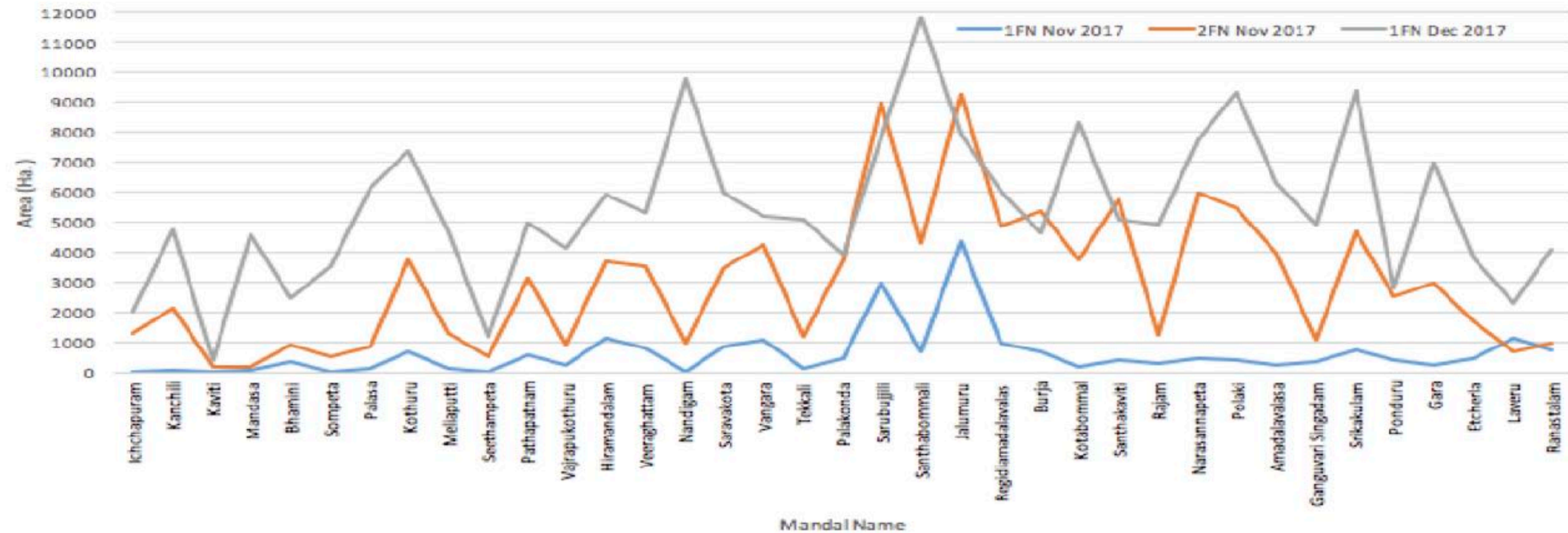
1FN December



201K Ha

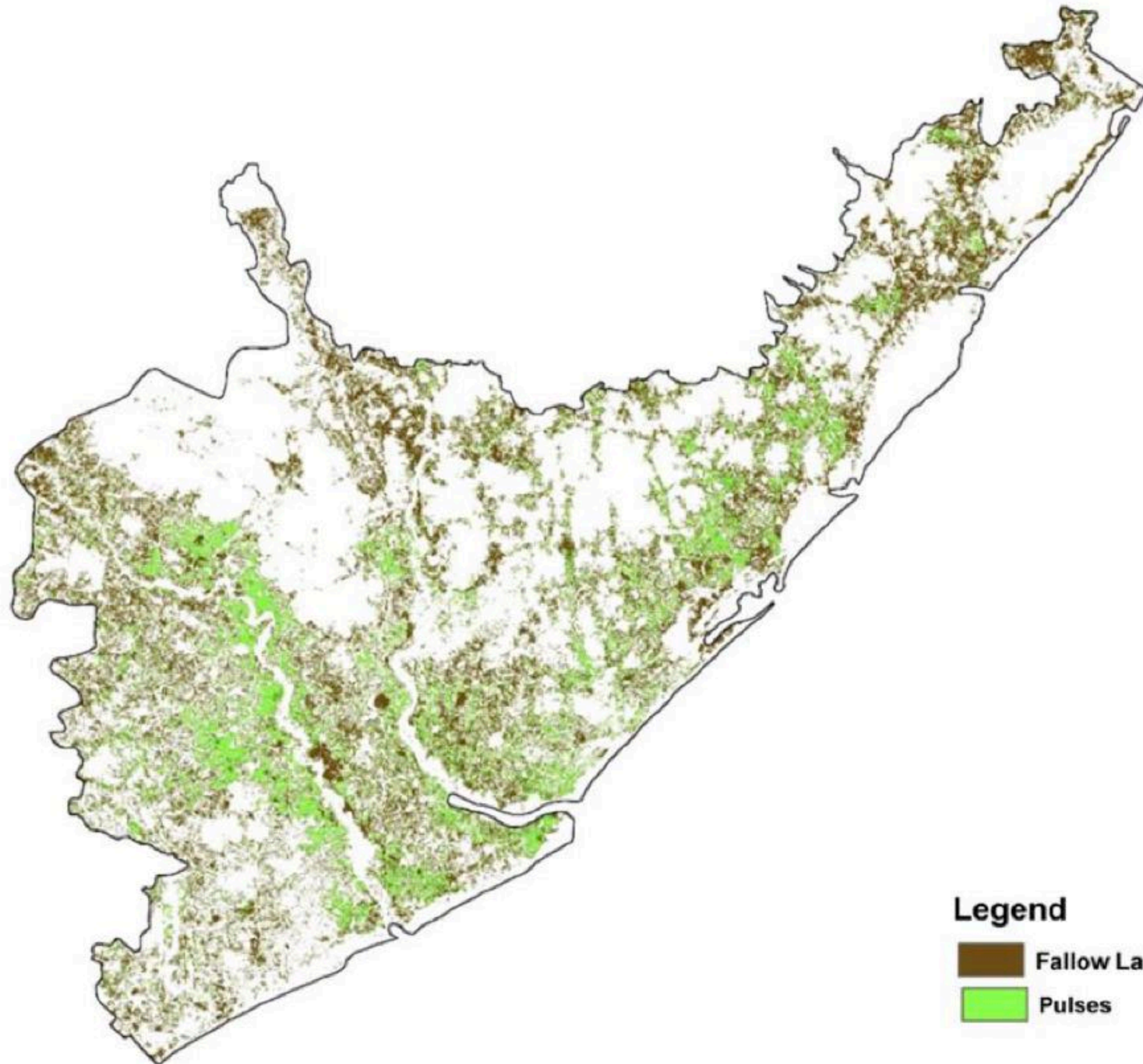
Accuracy - 97%
(on Acreage)

Mandal Wise Harvest



*Accuracy measured with data published by AP Govt for only 5 mandals

Rabi 2018 - Initial Update



Legend
Fallow Land
Pulses

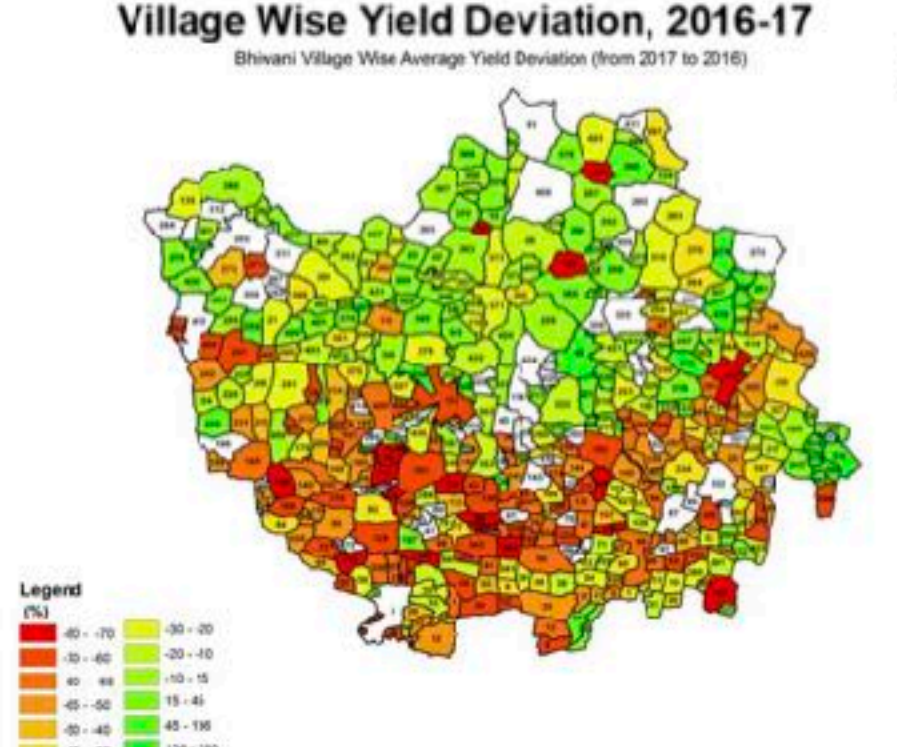
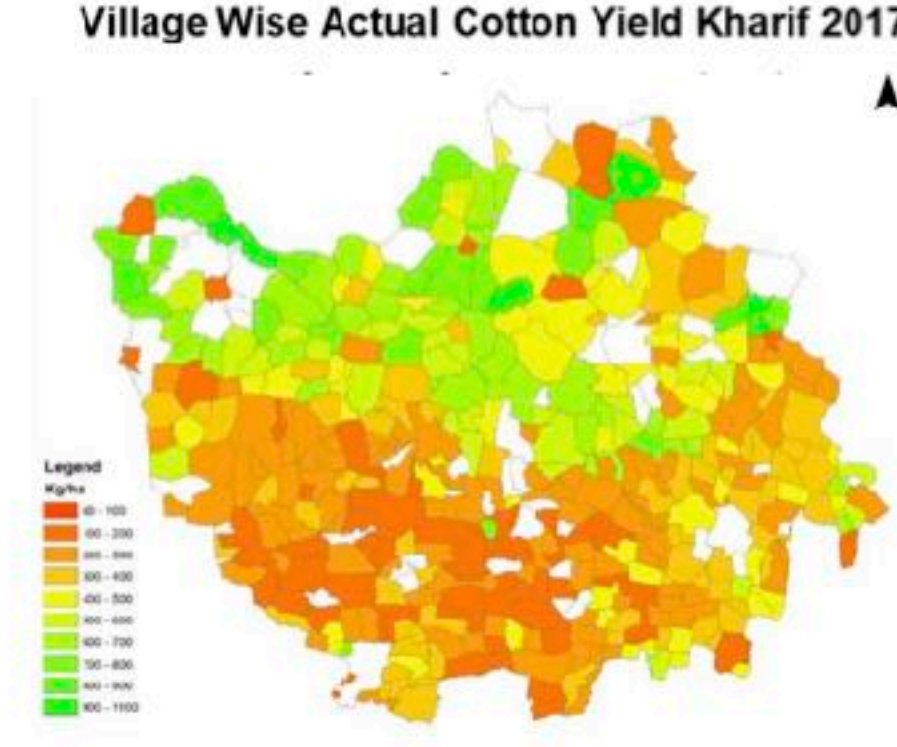
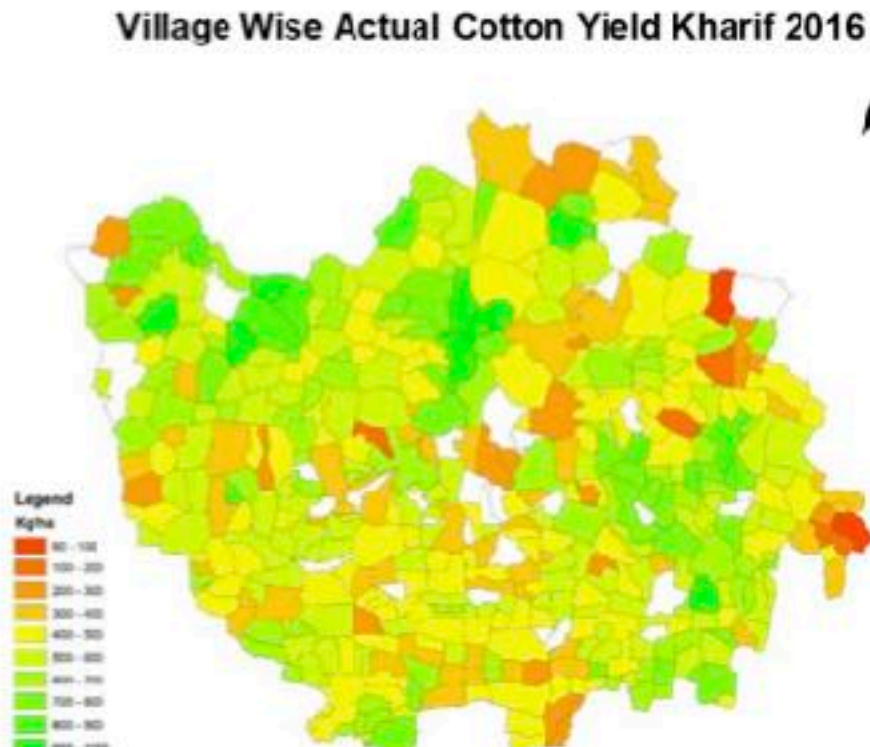
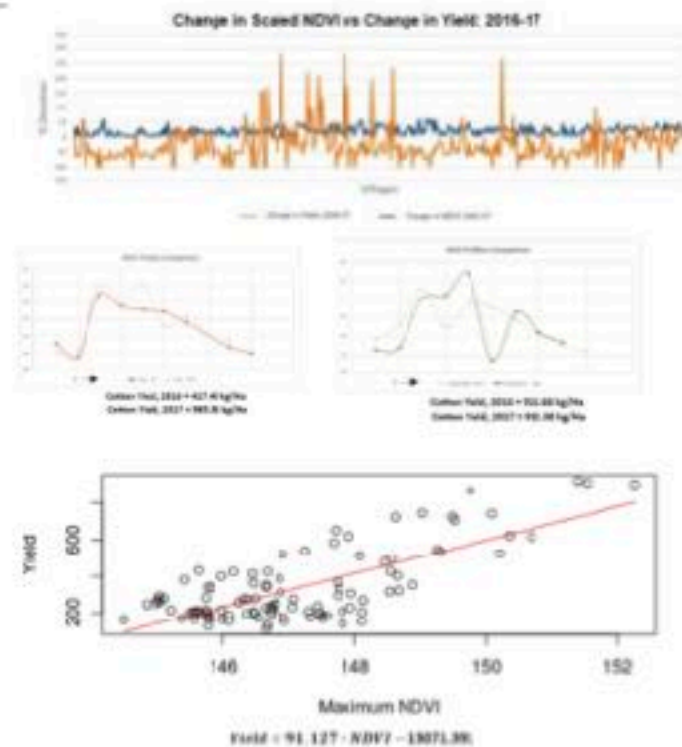
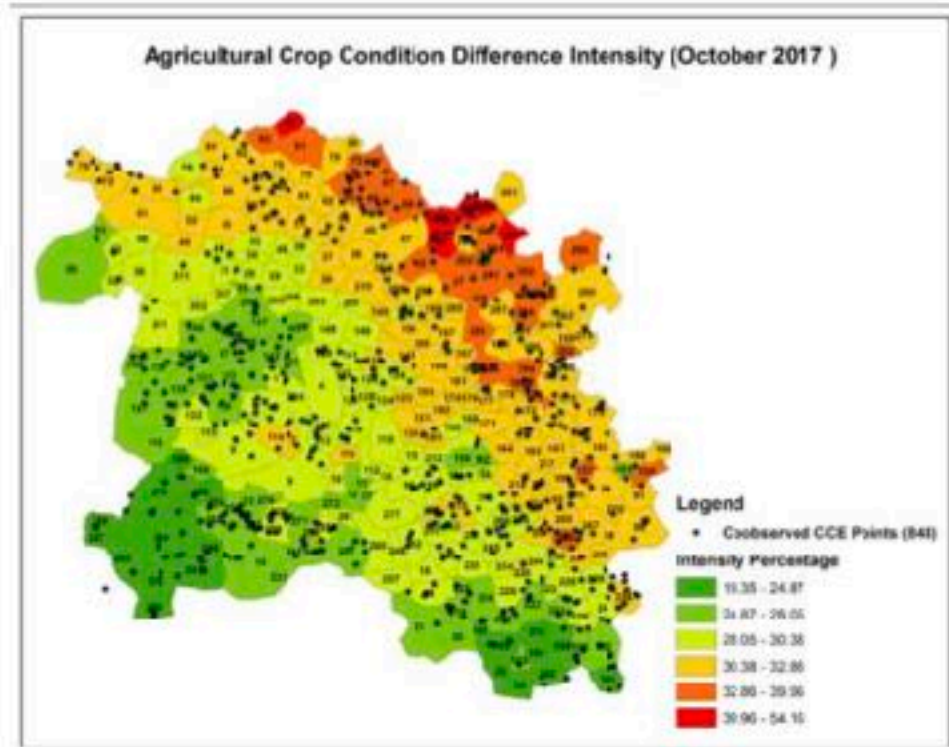
Area	Satellite Detected Area (Ha.)	Reported Area (Ha.)
Pulses	77987.50	79095.55
Green gram		825.89
Red gram		44279.32
Horse gram		33607.61
Bengal gram		382.73
Fallow Land	117680	

Crops in Next Update < 10,000 Ha.

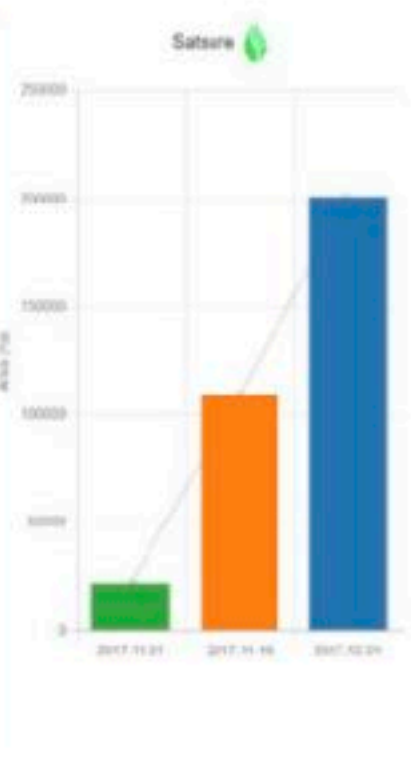
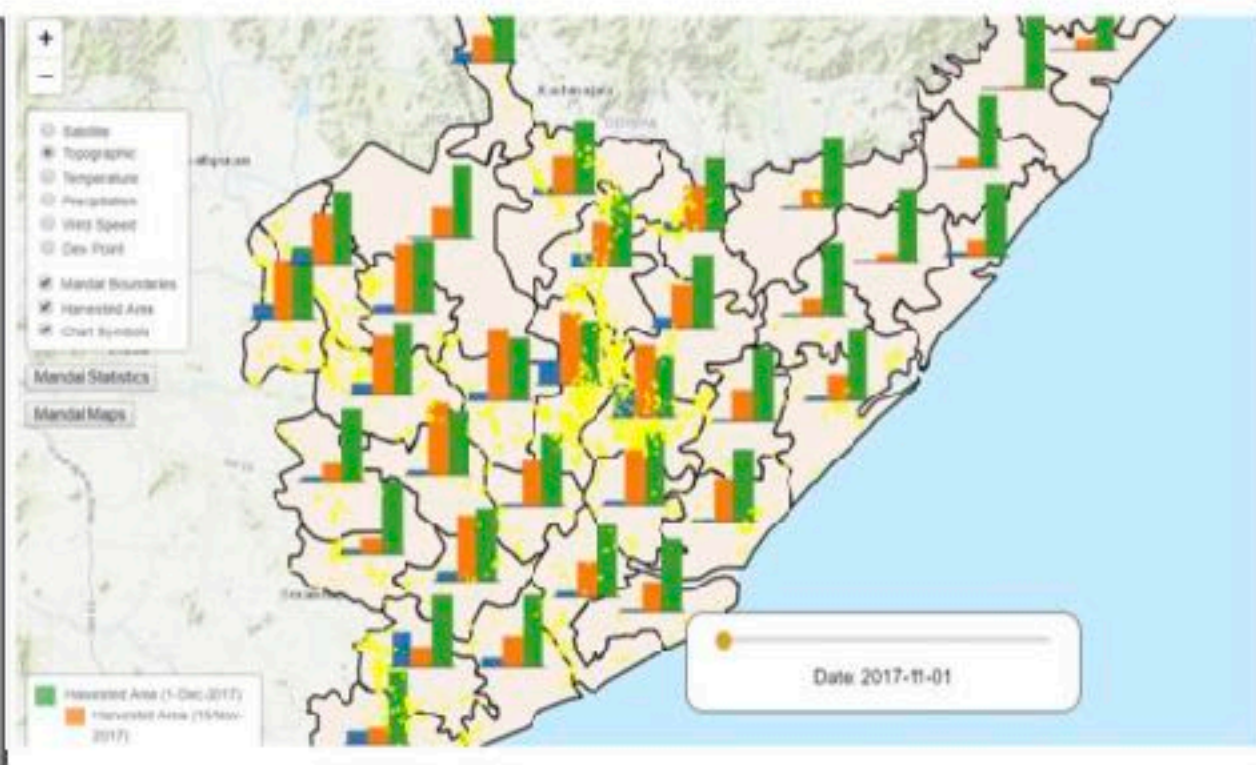
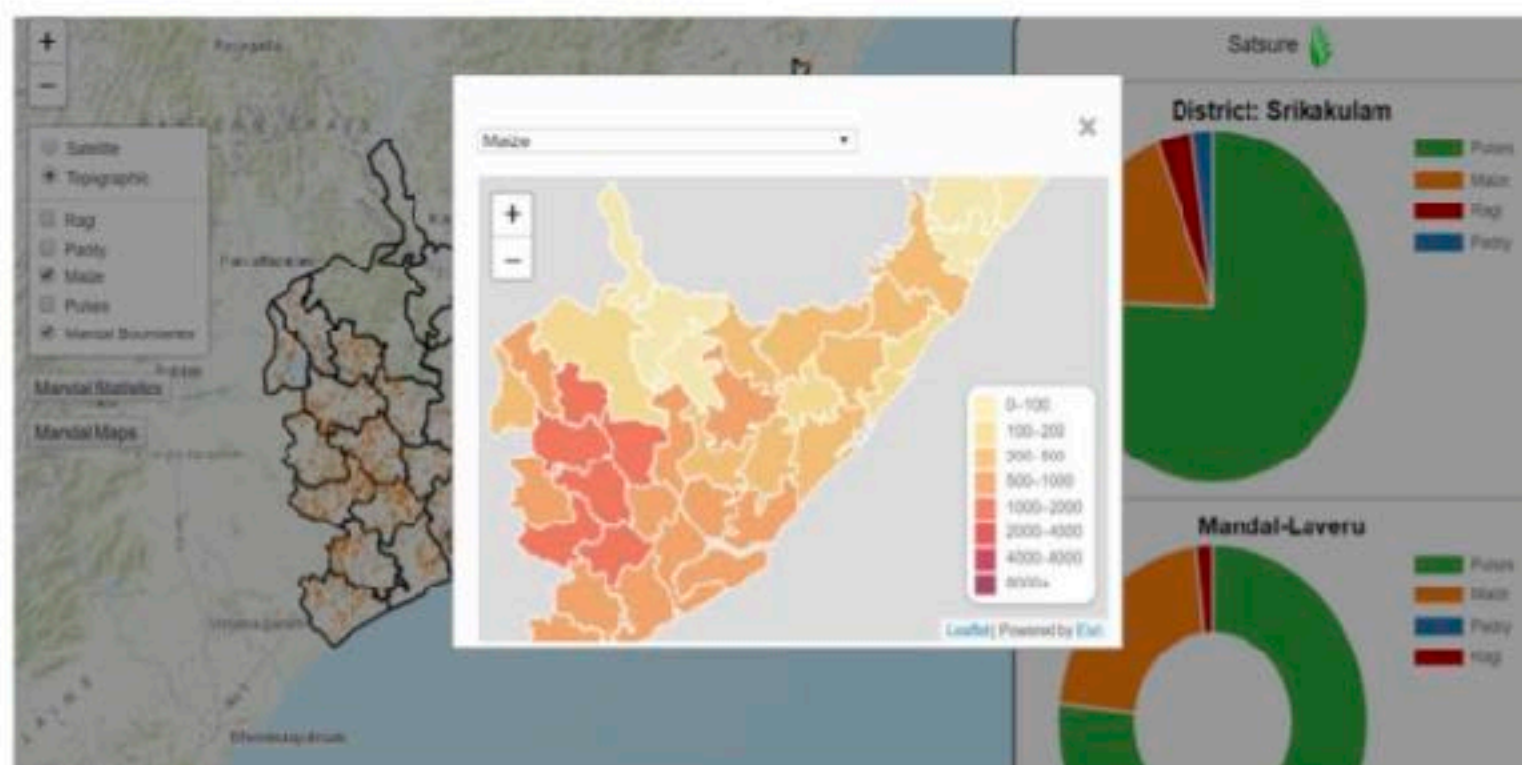
- Maize
- Groundnut
- Paddy
- Sesame
- Sugarcane

USER CASE STUDIES

INSURANCE CLAIMS SETTLEMENT

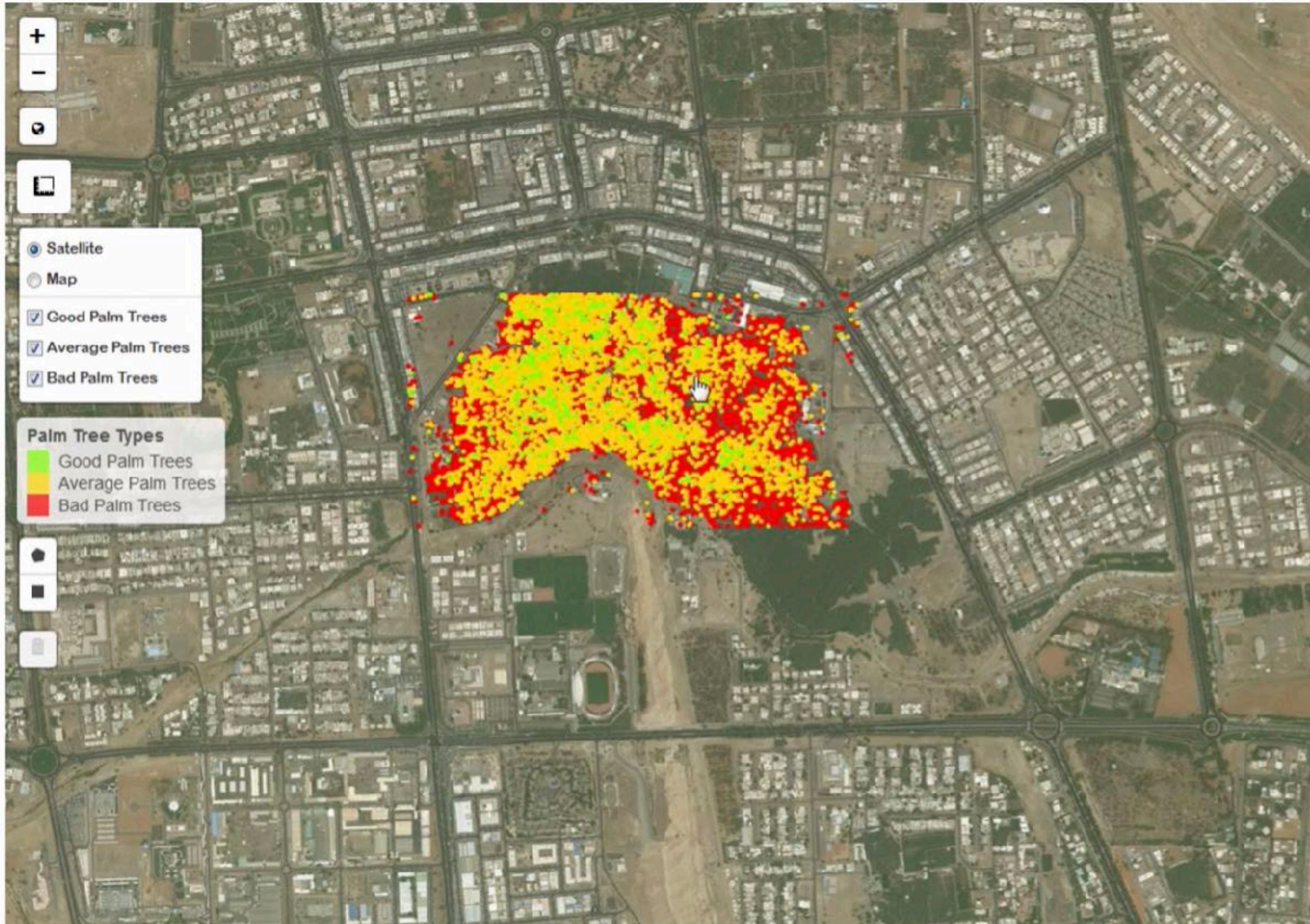
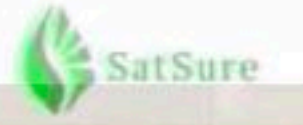


LARGE AREA MONITORING



COMMODITY ANALYSIS – DATE PALM

PALM TREE COUNTING



Area (ha): 2271.696

Count: 10597

Good:
312

Average:
4620

Bad:
5665

Actual Revenue (\$M): 13.219

Good (\$M):
0.624

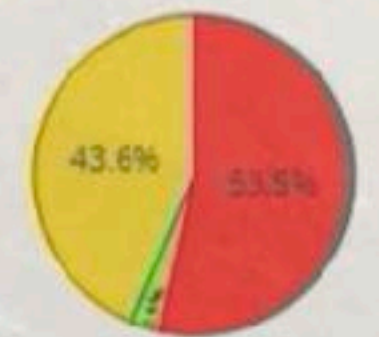
Average (\$M):
6.93

Bad (\$M):
5.665

Actual Possible Revenue (\$M): 21.194

Monetary Loss (\$M): 7.975

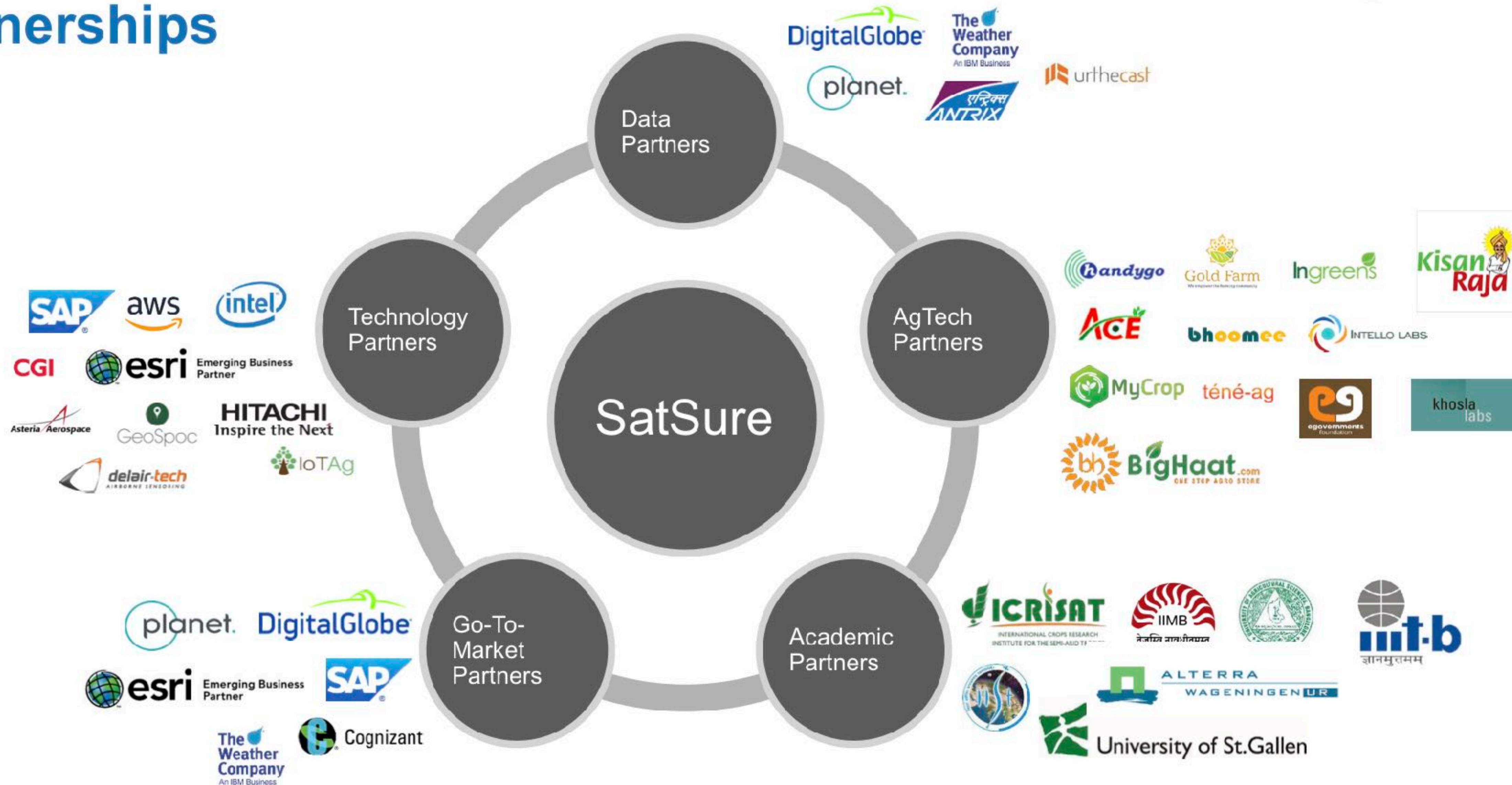
Category-wise Distribution



Data Table

Business Ecosystem

Partnerships



Can we help you?
Can you help us?



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