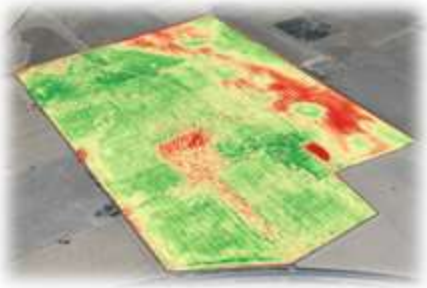
Role of New Technologies in Crop Production Forecasting

International Soy Conclave'2019

Nalin Rawal
CEO - AGCON



NCML Agribusiness Consultants Pvt ltd
(100% subsidiary of NCML , a Fairfax company)

We understand commodities

Company Overview

Our Vision

To be the Market leader in providing innovative Risk Management & Business solutions through Integration of technology & domain expertise in crop, commodity and agribusiness space.

100% owned subsidiary of NCML We understand commodities A FAIRFAX Company

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NCML Shareholders

hafed

punjab national bank ...the name you can BANK upon !

Corporation Bank

बैंक ऑफ़ इंडिया Bank of India Relationships beyond banking.

इंडियन बैंक Indian Bank

Our Expertise …

AGCON

Risk Management

Risk Management

Risk Management

Risk Management

Risk Management

Risk Management

Warehousing

Capacity
Owned – 3.25 million sq. feet **38 locations**
Leased – 5 million sq. feet **112 locations**

Clients 12500

New Public Private Project
- 16 Railway Freight Stations-cum-Silo complexes
- Capacity - 50,000 MT each
- Project Cost – $ 105 million

India's Largest Private Sector Agri- Warehousing Company

Collateral Mgmt

- 2400 locations
- 7000+ structures
- 23,500 clients
- 80 Commodities
- Average Assets under Management – Rs. 12,500 crore

India's no. 1 Collateral Manager – 45 per cent Market Share

Supply chain

- + 20, 000 farmers

Services
- Procurement
- Structured trade finance
- Farmer procurement for Government agencies

Commodity handled annually
- Volume - 300,000 MT
- Value – Rs. 1500 crore

Wholly integrated supply chain provider

NCML

NCML Finance

- Loan disbursal – over Rs. 500 crore
  - ✓ 150 clients
  - ✓ 40 locations
  - ✓ Zero NPAs
  - ✓ Warehouse receipt finance
  - ✓ Loan against property

Vision to be the leading agri value chain Finance Company

Testing & Certi

- 4 Regional State-of-the-art Hi-end Labs
- 8 Area Labs
- 18 Agro Testing Centres
- 150 Satellite Labs
- +35000 Clients
- +60,000 Samples
- Full Range of Food Quality and Food Testing parameters

India's most extensive network of Food and Agri Labs

Marketyard.com

- Vision to Create an Online Liquid Warehouse Receipt Market
- Fully Integrated Auction-Procurement-Sale Payment and Settlement System

India's only warehouse receipts e-commerce platform

AGCON

- Provide innovative Pre and Post harvest crop risk solutions
- Price and Market Intelligence Services to Banks and Agri Value Chain Participants
- Consultancy and Advisory Services – Agribusiness

MANDI PRICE

India's largest integrated Weather, Agri & Commodity Risk management Company….

Our Strengths:

- Operational presence in **28 States** & **2 Union Territory**
- **4500+ Automatic Weather Stations** network Pan India
- In house **GIS & Remote sensing** and **Data analytics** team
- Current price intelligence network in **2500+ Mandi's** across Pan India.
- Daily monitoring of prices of **340** commodities across PAN India
- **2000+** experienced manpower

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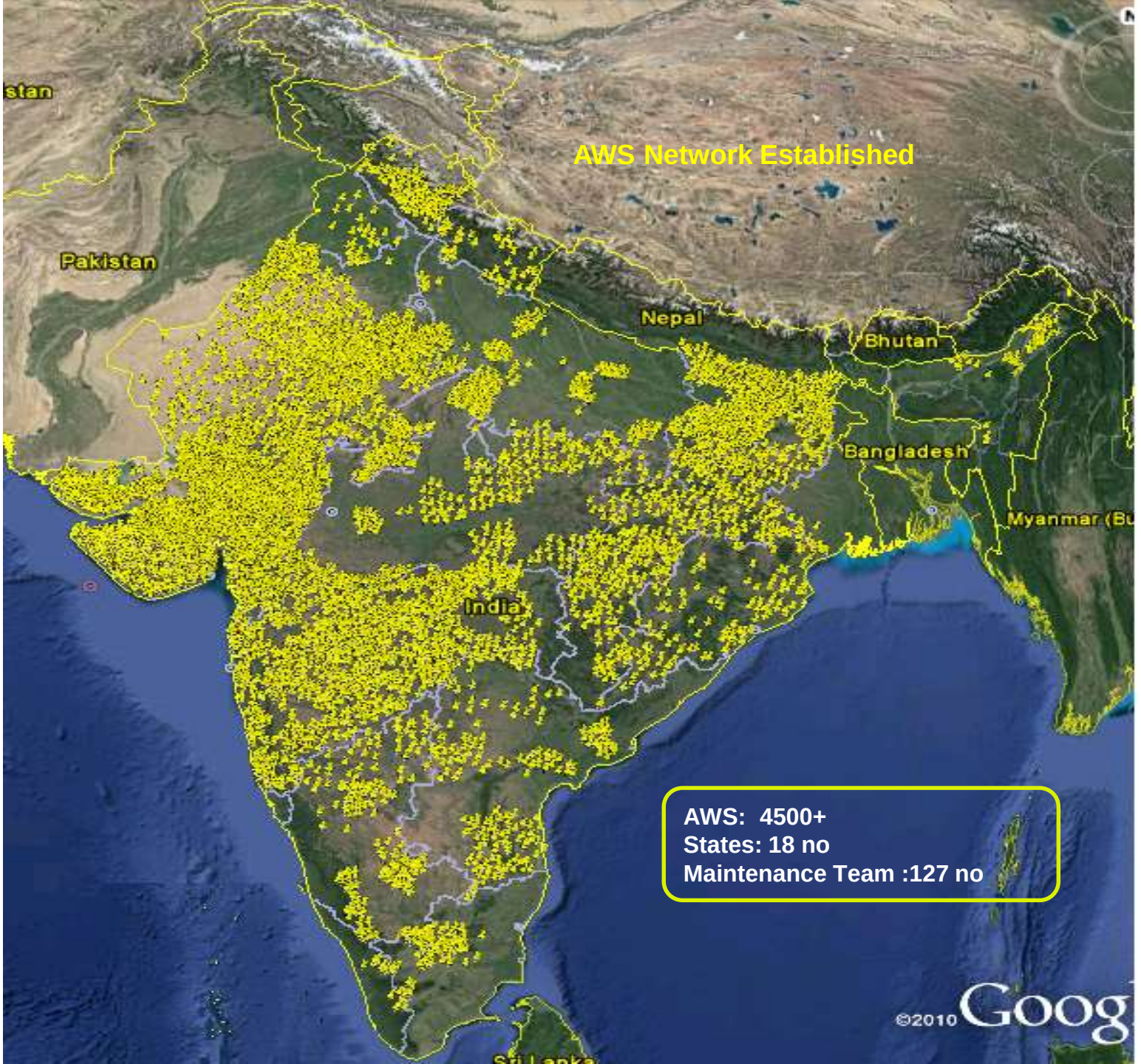
We understand commodities

- Rainfall
- Temperature
- Relative Humidity
- Wind speed
- Wind direction
- Solar Radiation
- Capabilities :

✓ Pressure,
✓ Soil moisture
✓ Soil temperature
✓ Leaf , Wetness, etc.,

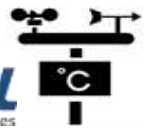


About AGCON

A Technology led Agri-Business Consultancy…..

- ✓ **Weather Services**
- ✓ **Remote Sensing / Satellite based Crop Acreage Estimation**
- ✓ **Satellite / UAV based Crop Monitoring & Production Forecasting**
- ✓ **Pre & Post harvest Crop risk assessment**
- ✓ **Commodity Research & Price forecasting**
- ✓ **Agri business & Agri Value Chain Consultancy**

Solution through integration of Domain Knowledge and Technology:

Automatic Weather Station	Remote Sensing	Drones / UAV	Big Data Analytics	Artificial Intelligence
				

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Crop Acreage Estimation

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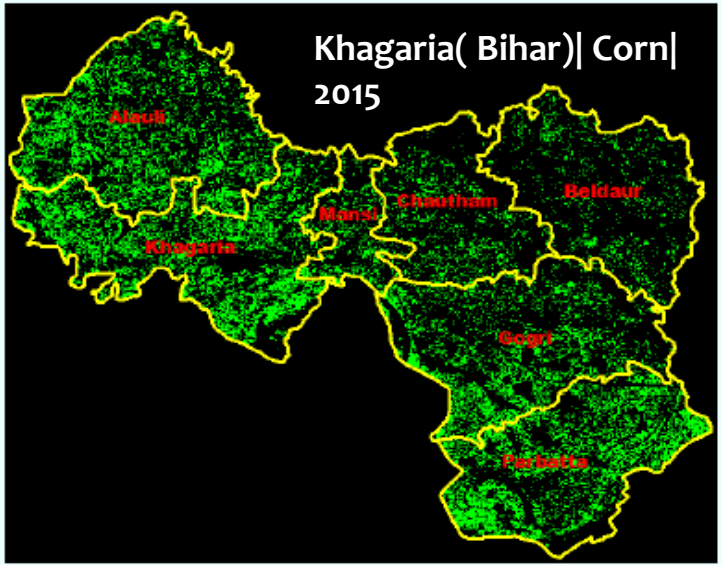
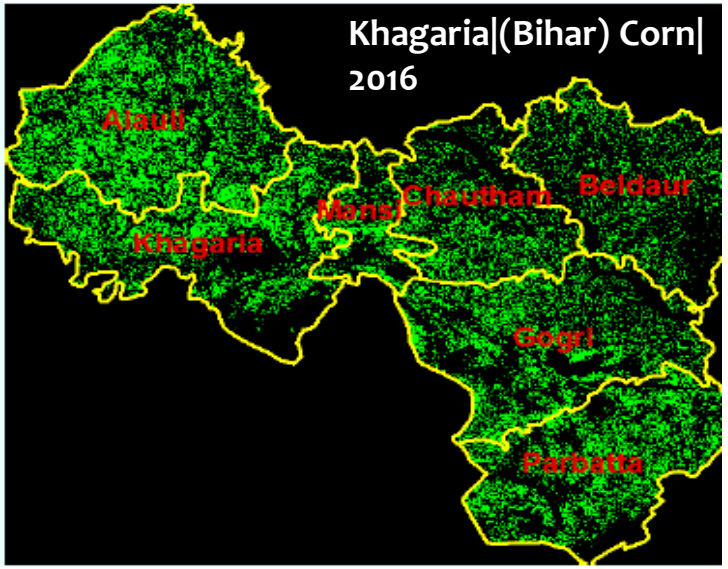
Technology used

GIS and Remote Sensing Based Acreage Estimation





- ✓ Crop Acreage Estimation at **Village and Taluka Level**
- ✓ Current season **crop acreages vis- a- vis last year**
- ✓ Difference between **early, normal and late sown crop**
- ✓ **Acreage and Age of plantation** / orchard

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Remote Sensing Based Acreage Estimation

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PALM PLANTATION ACREAGE / AGE STATUS (East Godavari- Andhra Pradesh)

2016

2015

2014

Age of plantation based on multi date satellite imagery in past

2015

Plantation is significantly visible

2014

Plantation is visible

2013

Initial stages of plantation

2012

Before plantation some other crop

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Date Palm Plantation – Kutch (Gujarat)

Individual Farm Monitoring

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Crop Monitoring & Yield Forecasting

(Weather +Technology + Field validation +Advance Models)

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Case Study Kharif'2019

Soybean Crop Monitoring

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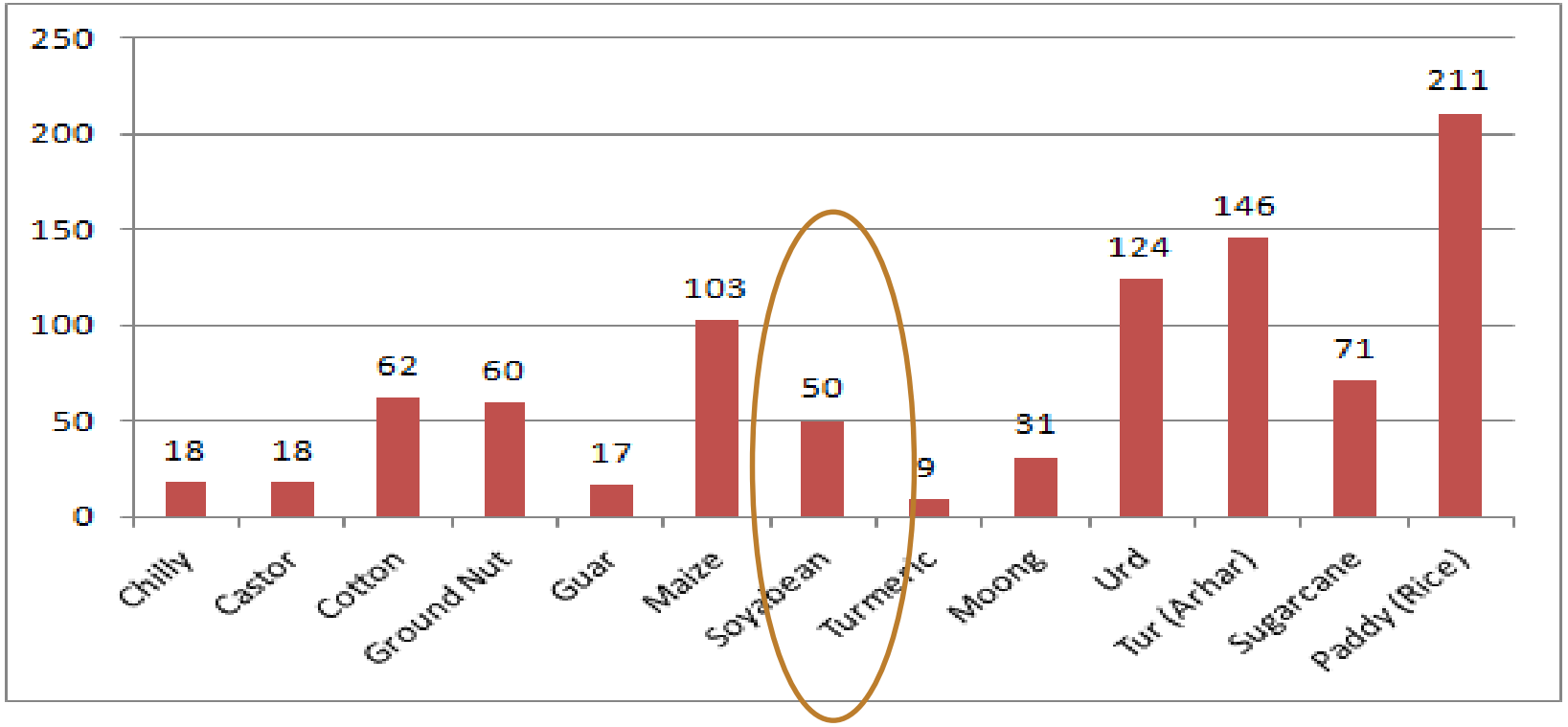
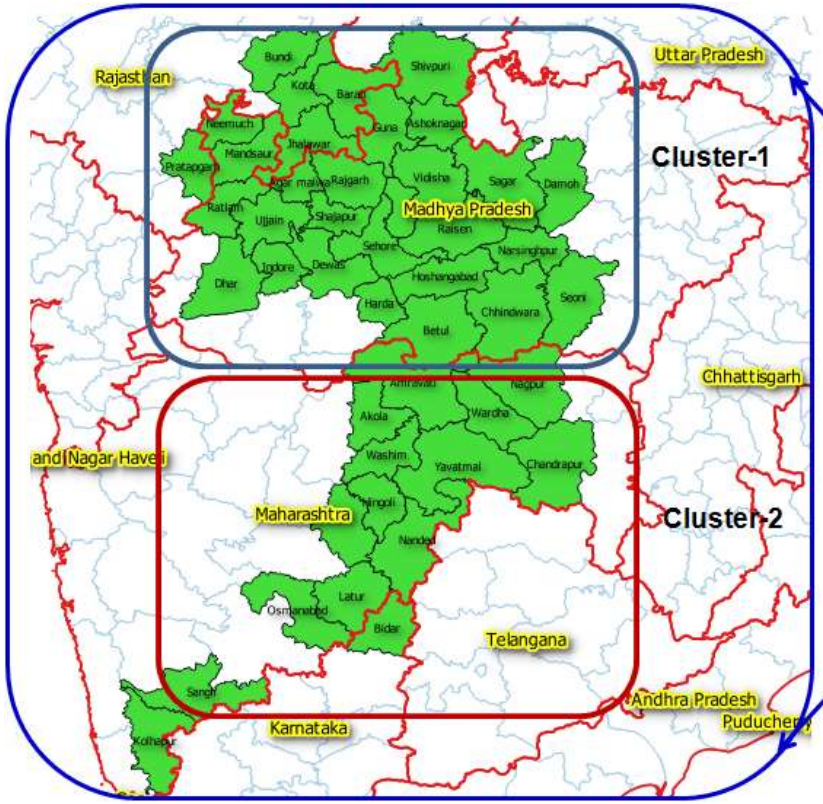
Districts contributing 90% of crop Production in India

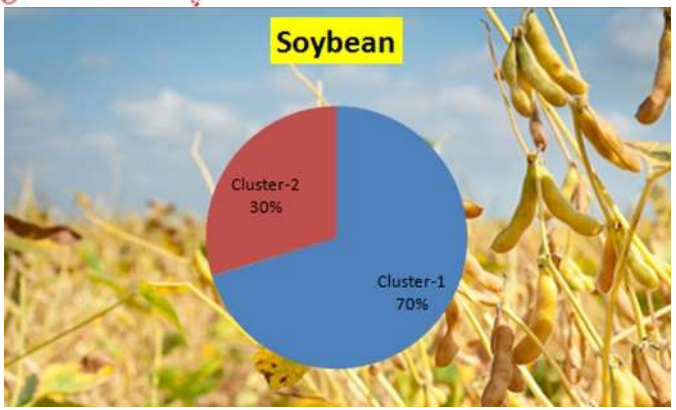


Crop Monitoring

Soybean



- 50 Districts Contribute to 90% of Production
- 94% of area under Soybean is Rainfed



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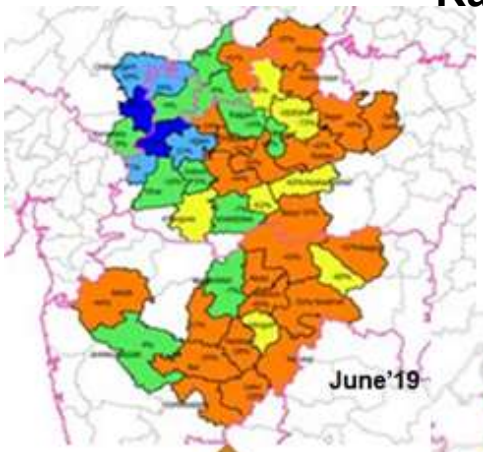
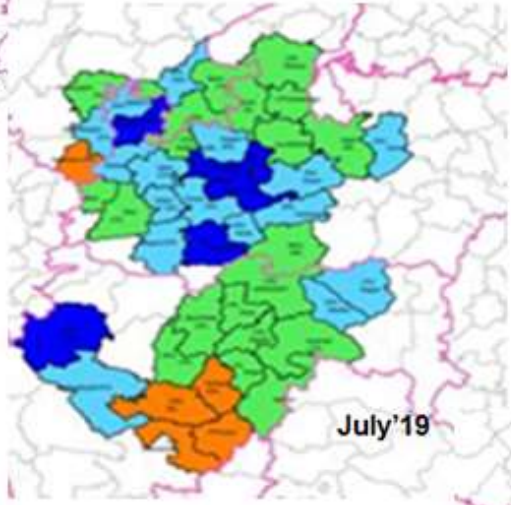
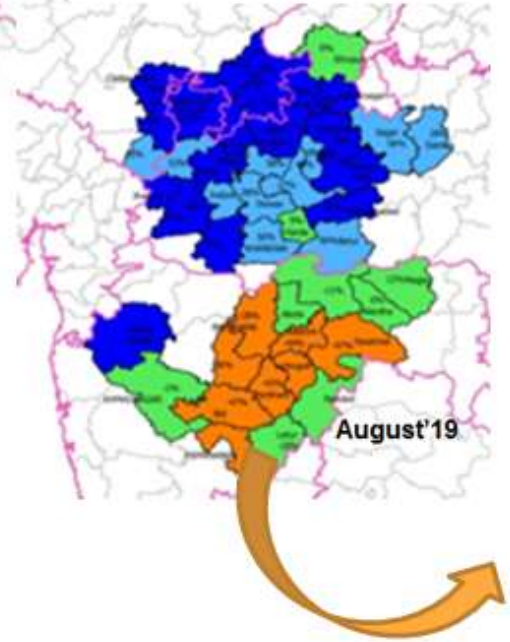
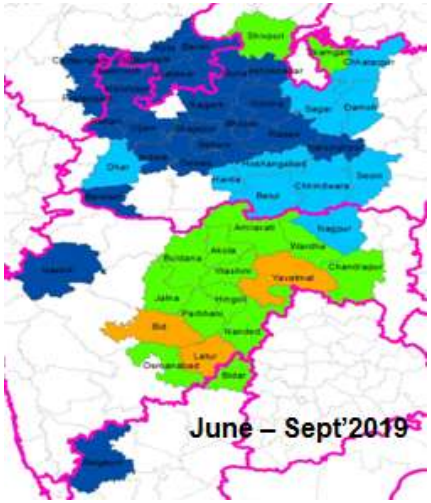
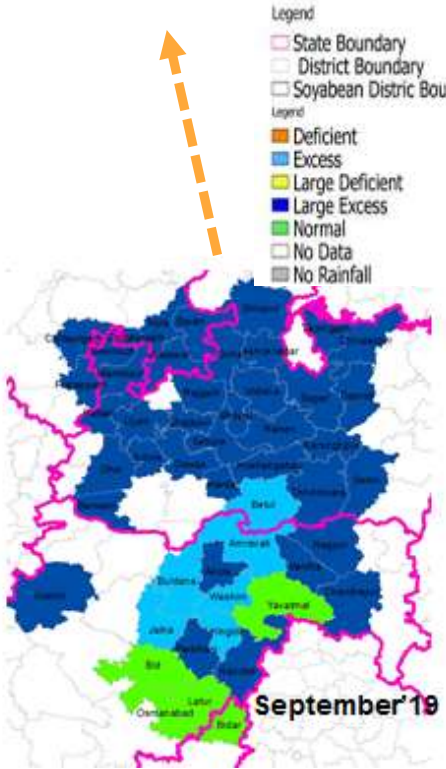
Rainfall Pattern in Soybean growing Districts Monsoon '2019











Rainfall Status in Soybean Distt (in %)

Distt Condition	Jun	Jul	Aug	Sep
Large Deficient	17	0	0	0
Deficient	47	9	15	0
Normal	23	44	21	10
Excess	9	34	24	14
Large Excess	4	13	40	76

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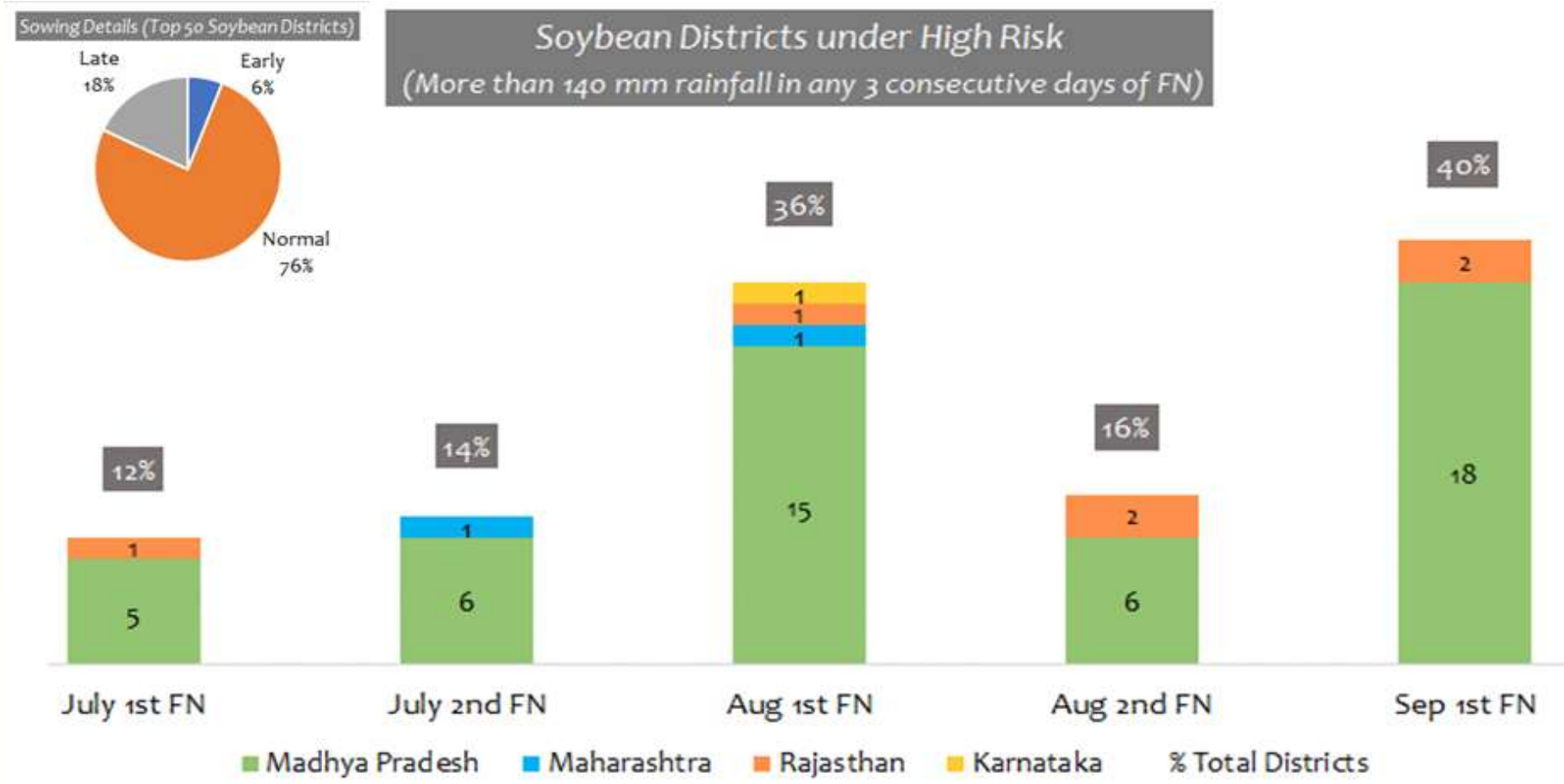
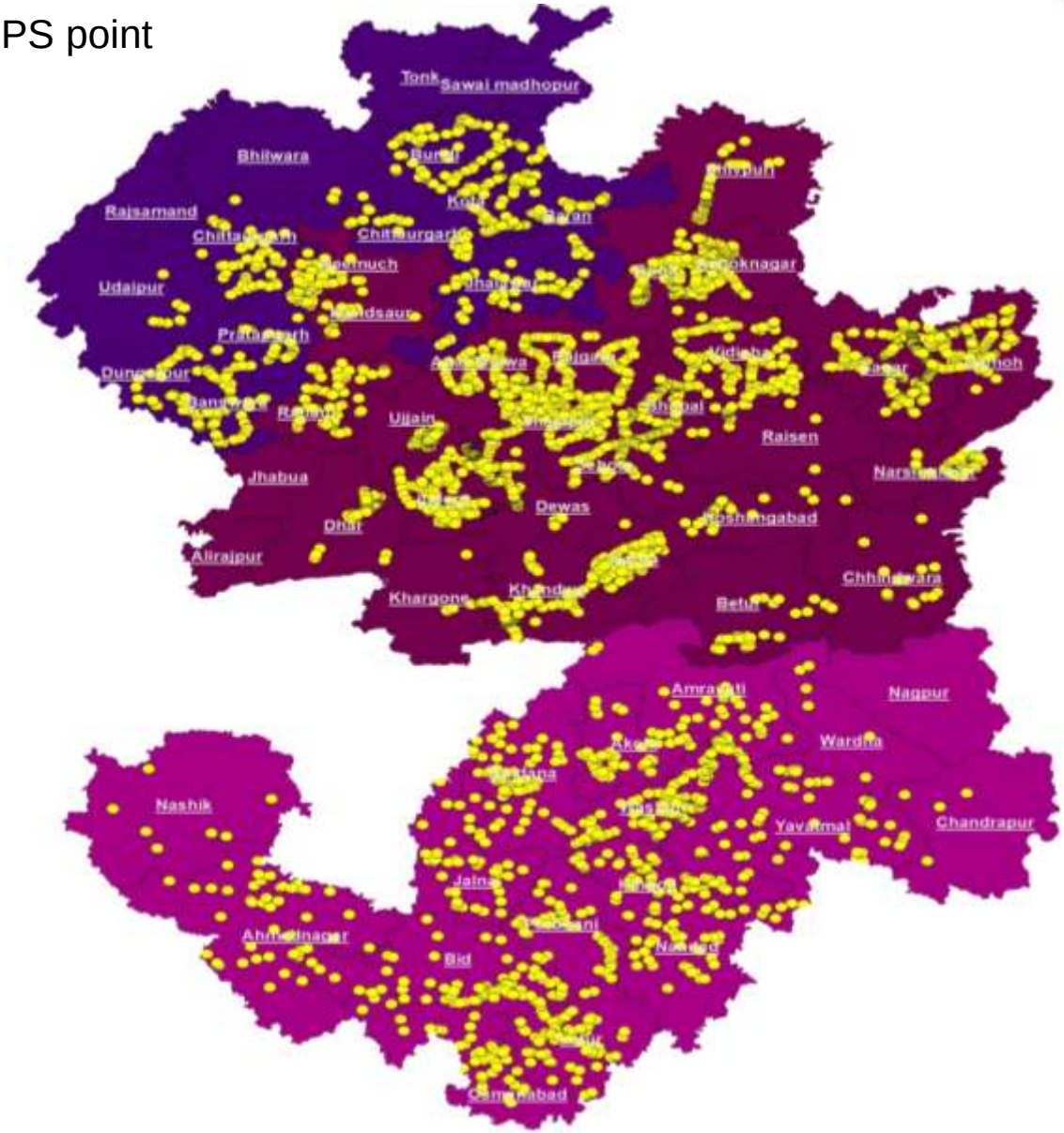
Impact of Rainfall Pattern on Soybean Districts



Field visit

8500 + GPS point



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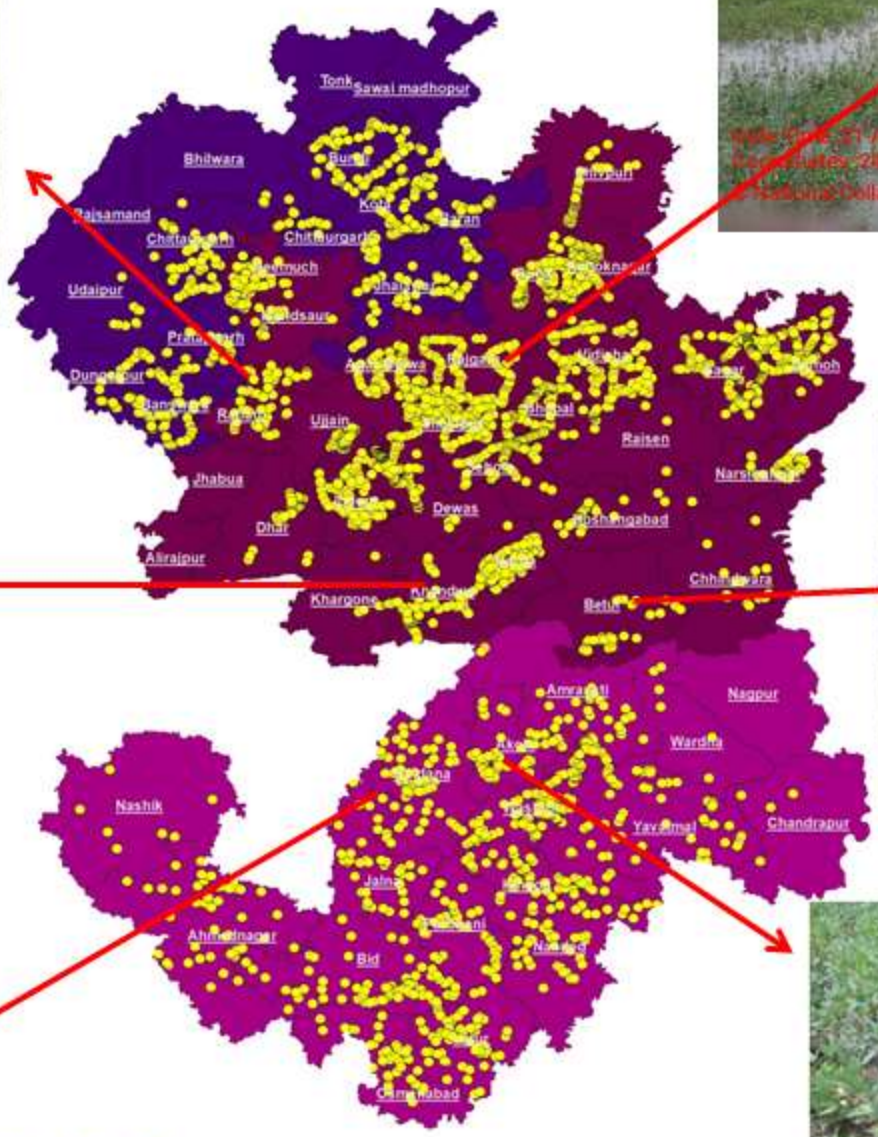
Geo-tagged Field Points
GPS Points map



GPS Points

Crop Monitoring

Vidisha District - Madhya Pradesh

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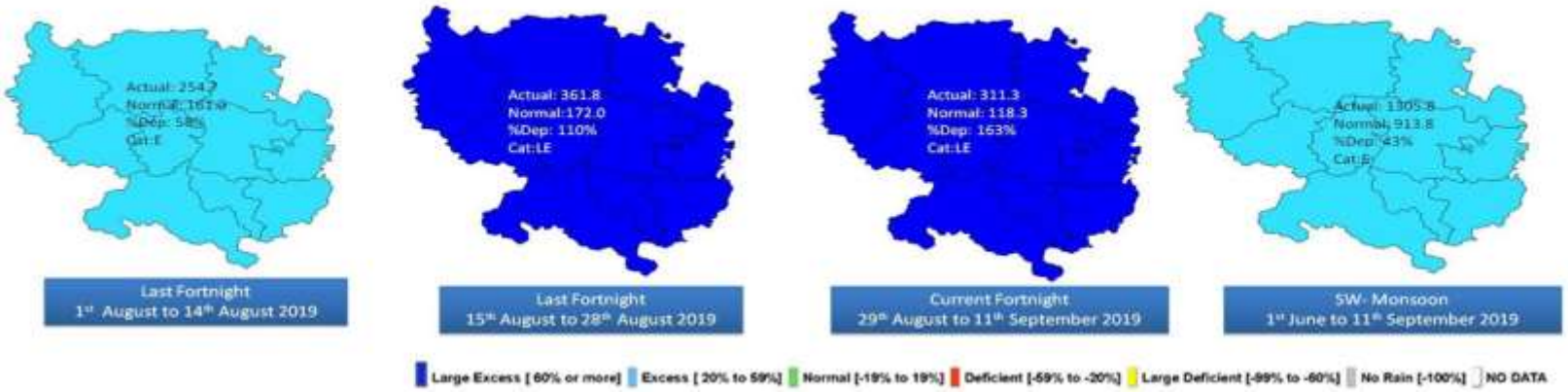
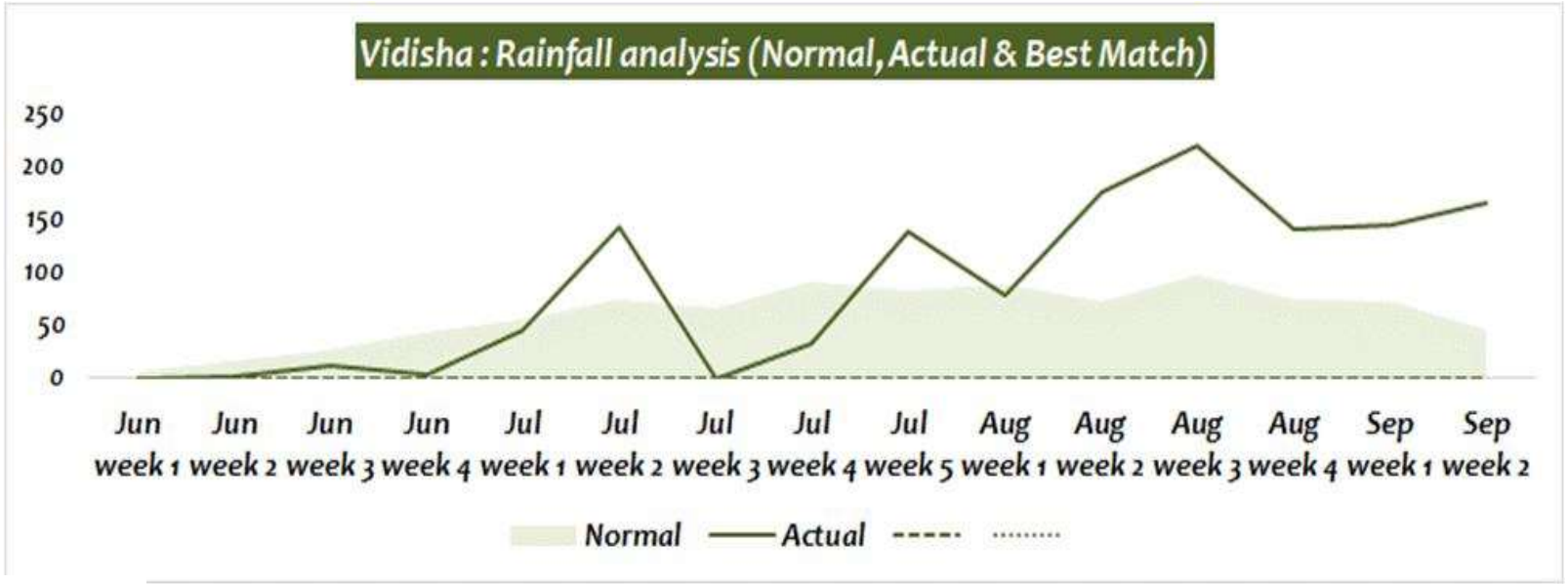
State: MADHYA PRADESH
District: VIDISHA





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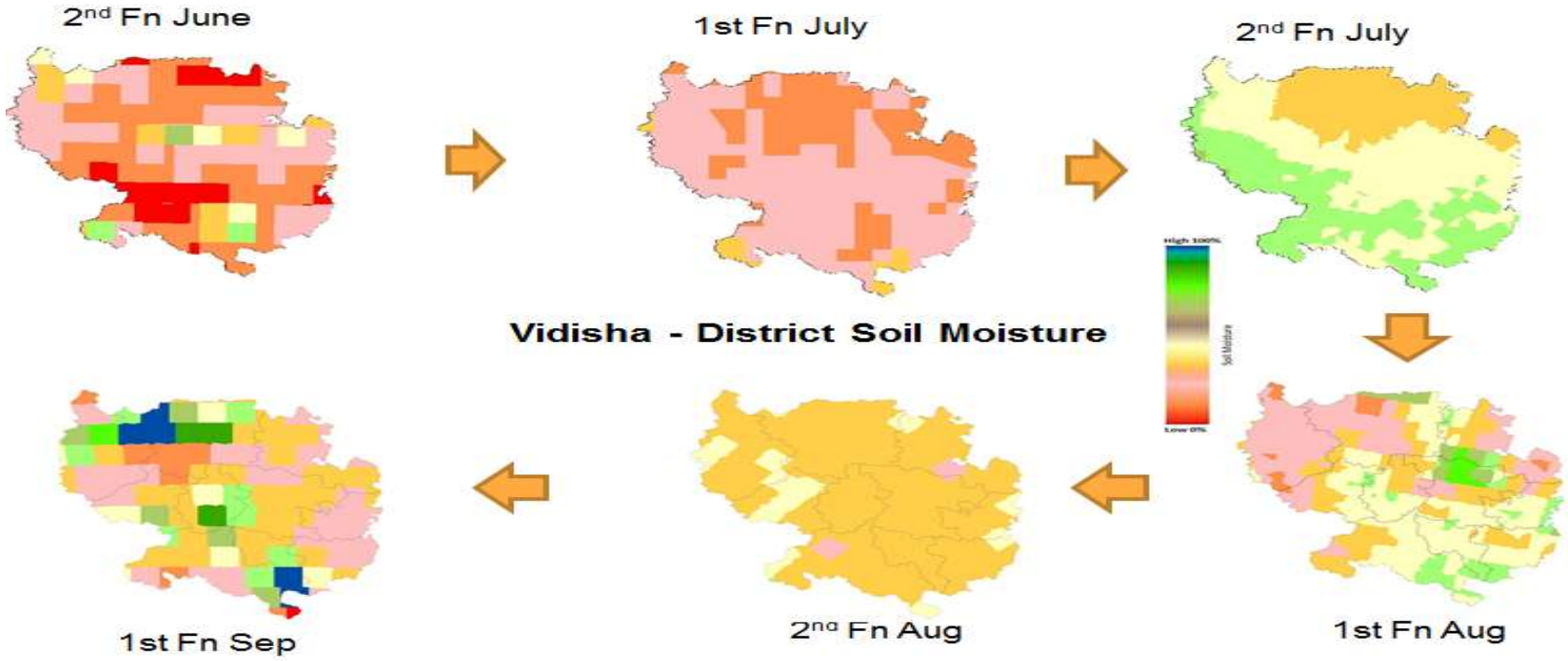
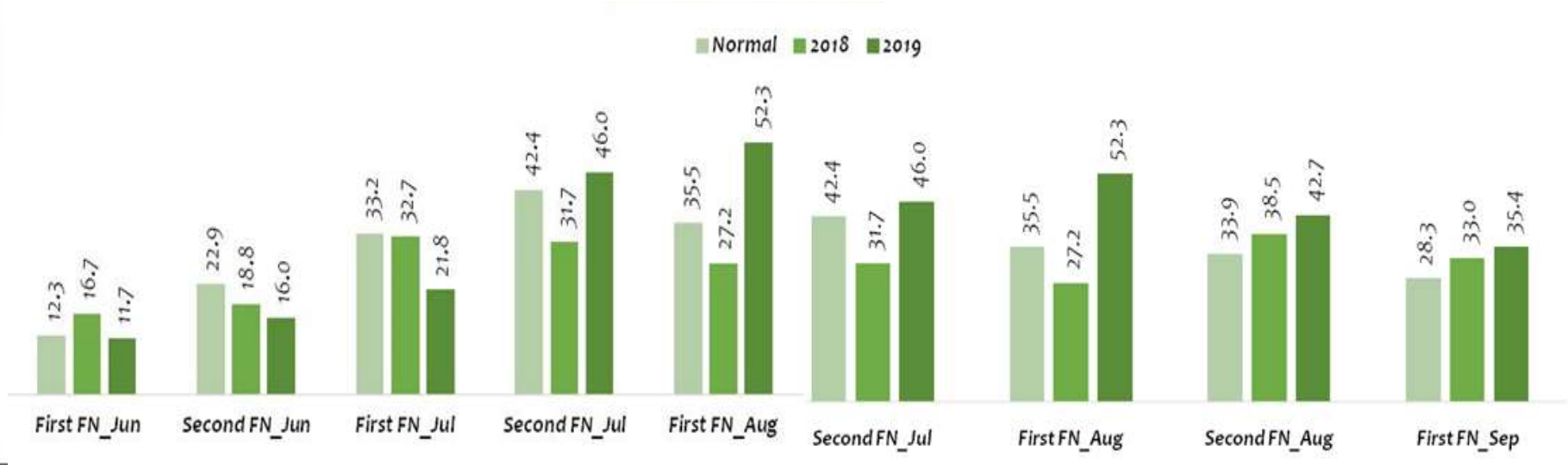
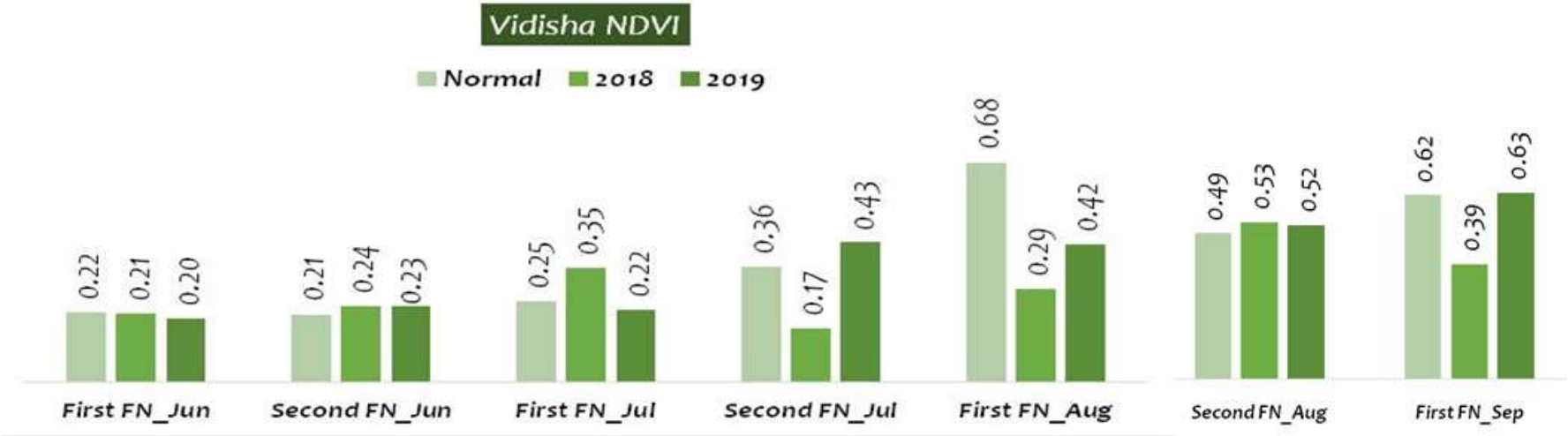
Vidisha – Soil Moisture Status





Vidisha – Crop Health Status



Vidisha – Field Survey GPS Points map

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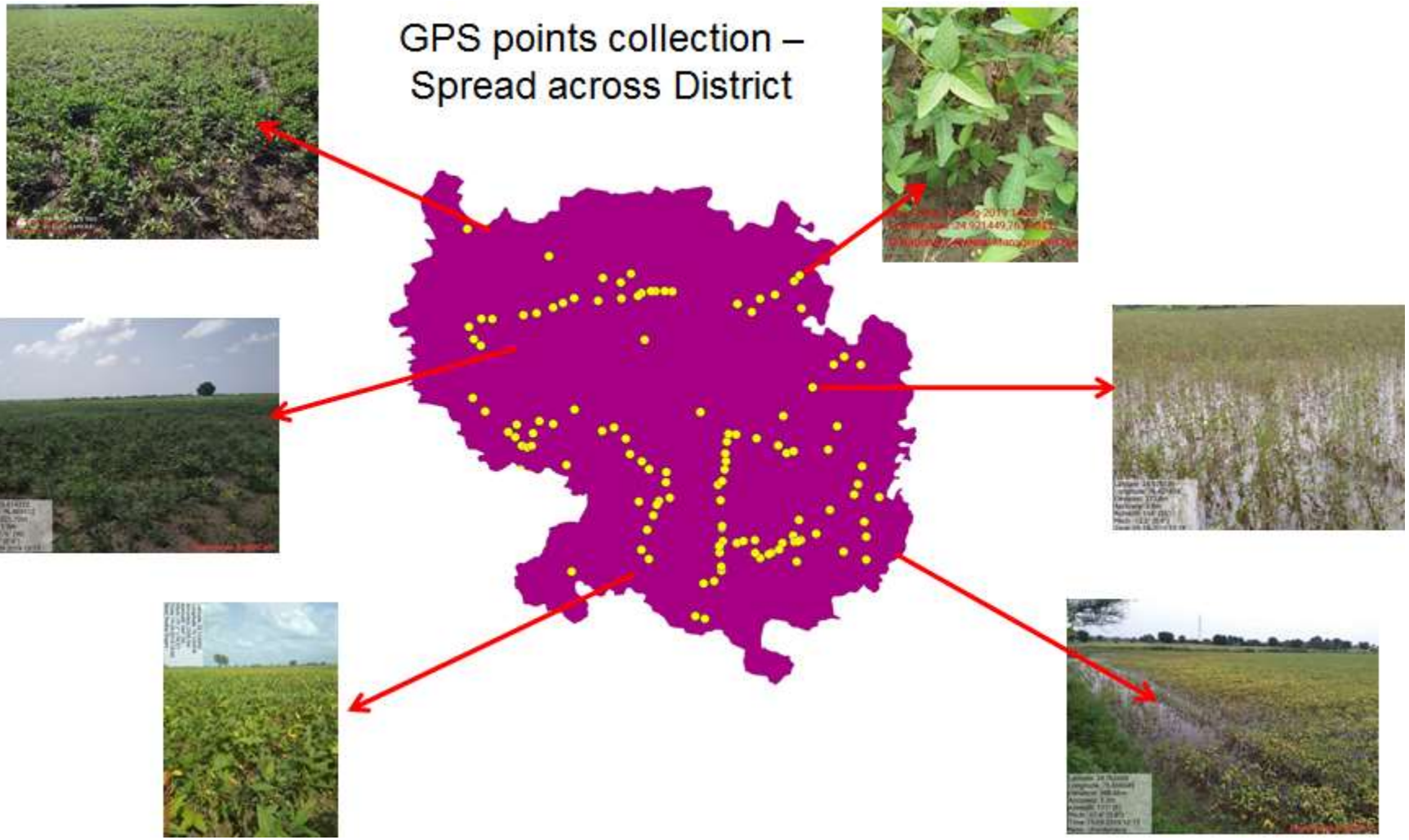

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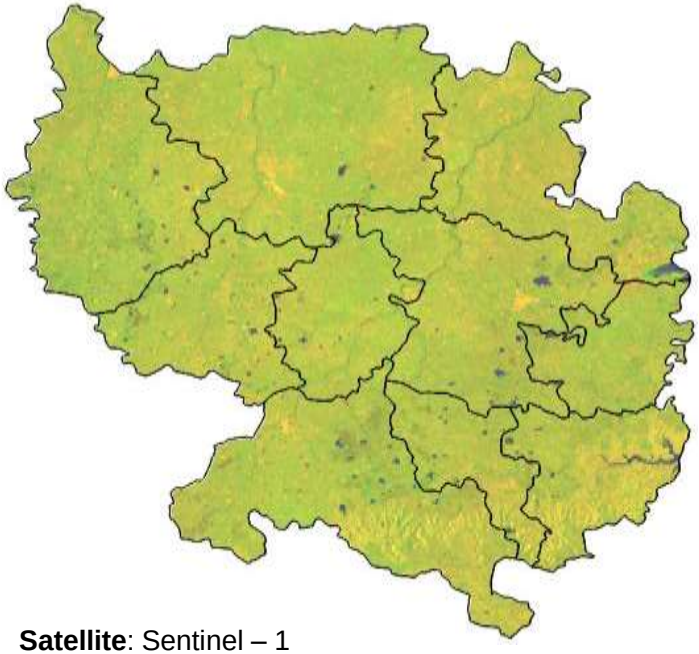
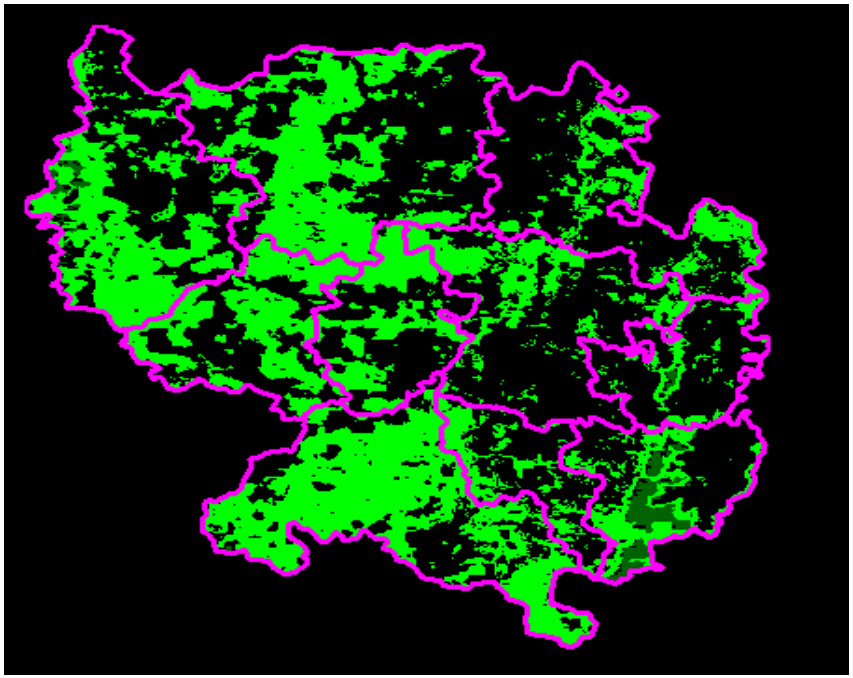
Vidisha – Remote Sensing Based Acreages

Microwave Satellite images – Classification of Soybean Crop



Satellite: Sentinel – 1
Resolution: 10/20M
Date of Acquisition: During September Month
Band: C-Band/L-Band
Polarization: VV Sigma, VH Sigma



Soybean Crop

Spatial Distribution of Soybean Crop

Remote Sensing Based Soybean Acreage

District	Government Area (Till End of Aug'2019) in Ha	Remote Sensing based Area
Vidisha	3,35,600	332,500

Technology Integration for Accurate Yield forecasting

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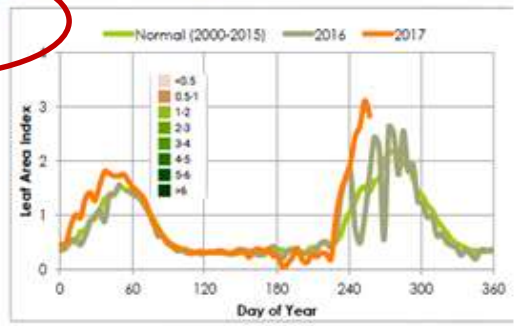
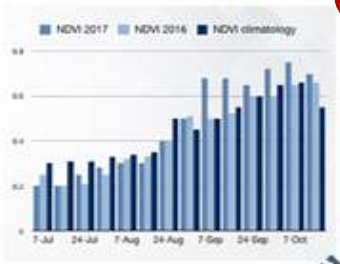
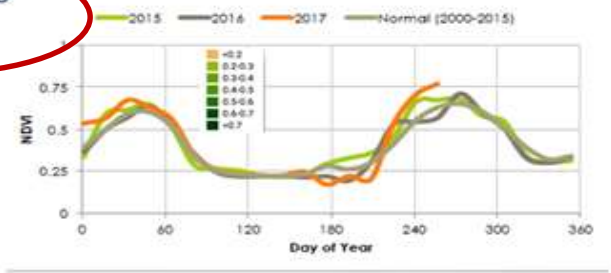
Leaf Area Index

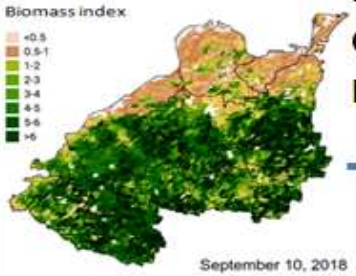




NDVI Analysis



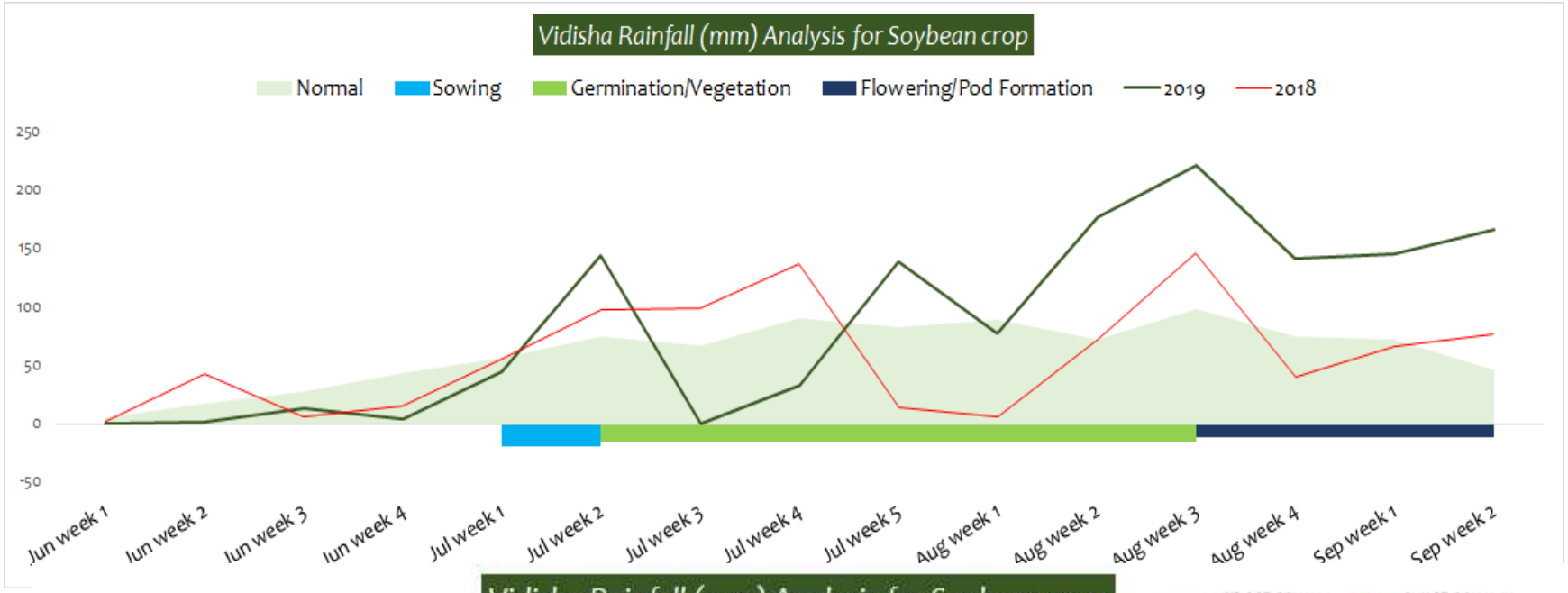
Biomass Analysis

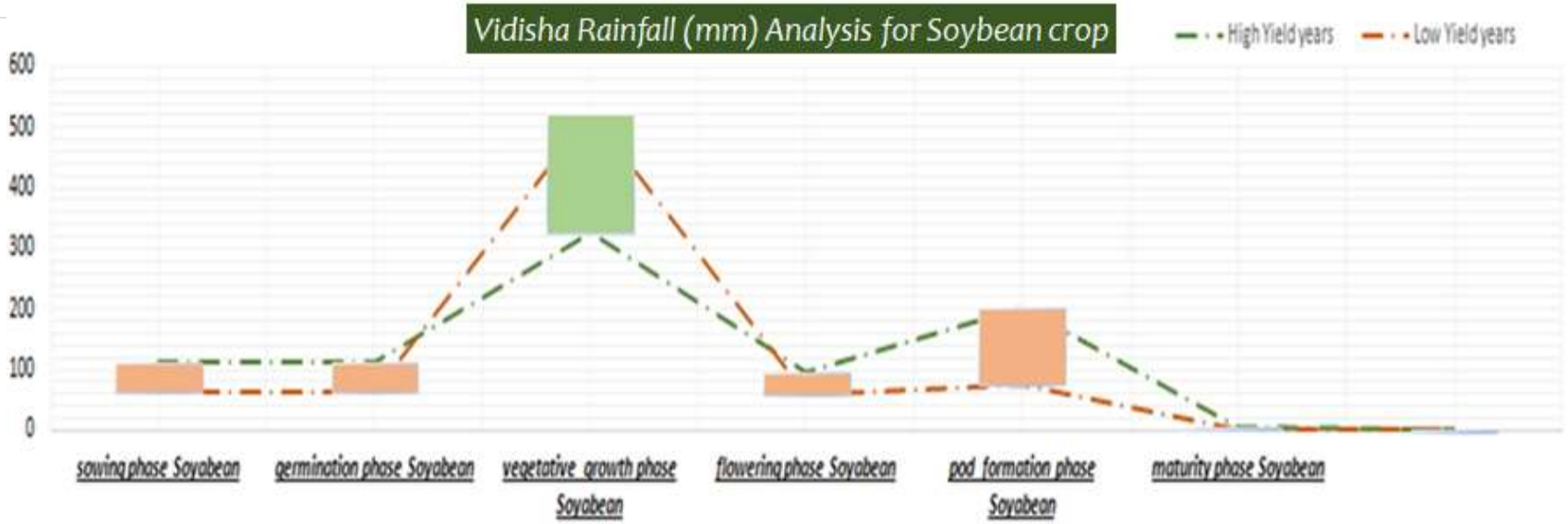


Field validation

Yield

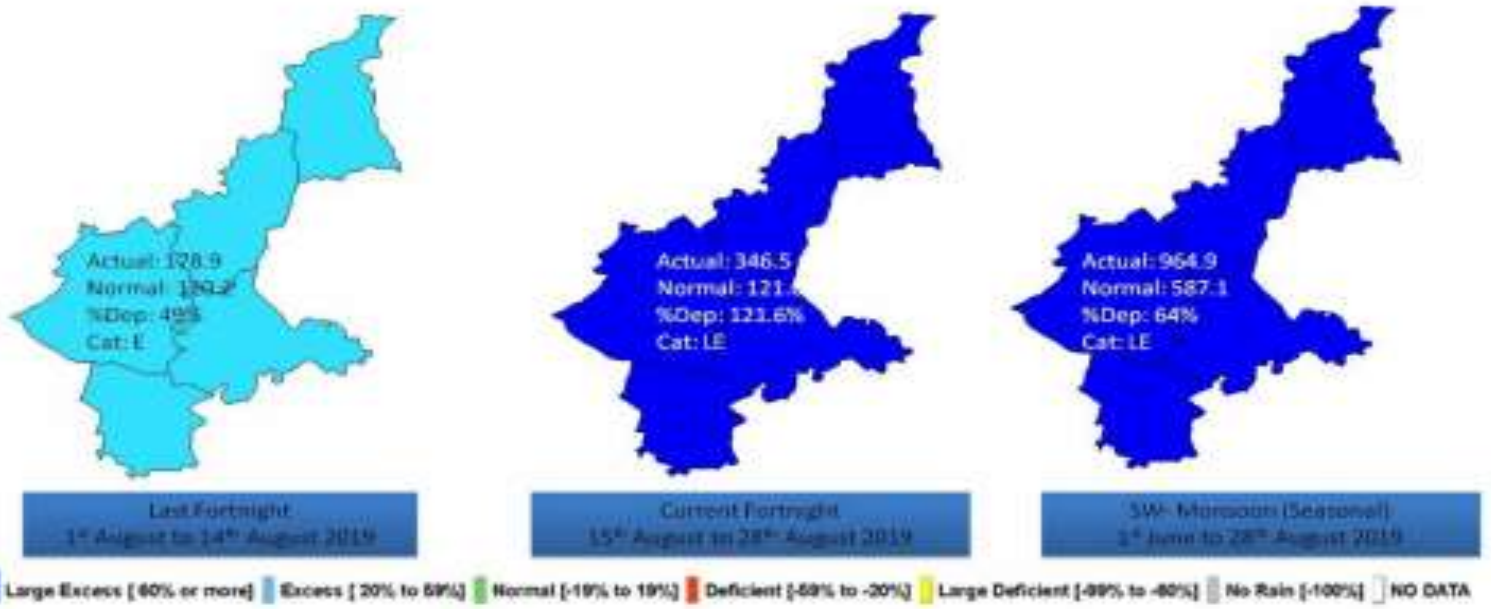
Model based on Rainfall and Water Requirement - Vidisha





KOTA DIST
RAJASTHAN
FLOOD MONITORING

Rainfall – Monitoring (Kota)



Weekly & Fortnightly Rainfall (in mm)

Weekl

	DATE	ACTUAL (mm)	NORMAL (mm)	%DEP.	CAT.
Weekly	1st Aug to 7th Aug	126	58.6	115%	LE
Weekly	8th Aug to 14th Aug	52.9	61.6	-14%	N
Fortnightly	1st Aug to 14th Aug	178.9	120.2	49%	E
Weekly	15th Aug to 21st Aug	263.8	73.3	260%	LE
Weekly	22nd Aug to 28th Aug	82.7	48.3	71%	LE
Fortnightly	15th Aug to 28th Aug	346.5	121.6	185%	LE
Seasonal	1st June to 28th Aug	964.9	587.1	64%	LE

Kota - Optical Satellite Images (during floods)

Combination of 17th and 24th July 2019

Satellite: Landsat-8
Resolution: 30M
Date of Acquisition: July' 2019

Combination of 8th and 18th August 2019

Satellite: Sentinel – 2
Resolution: 10M
Date of Acquisition: Aug'2019

Kota - Microwave Satellite Images

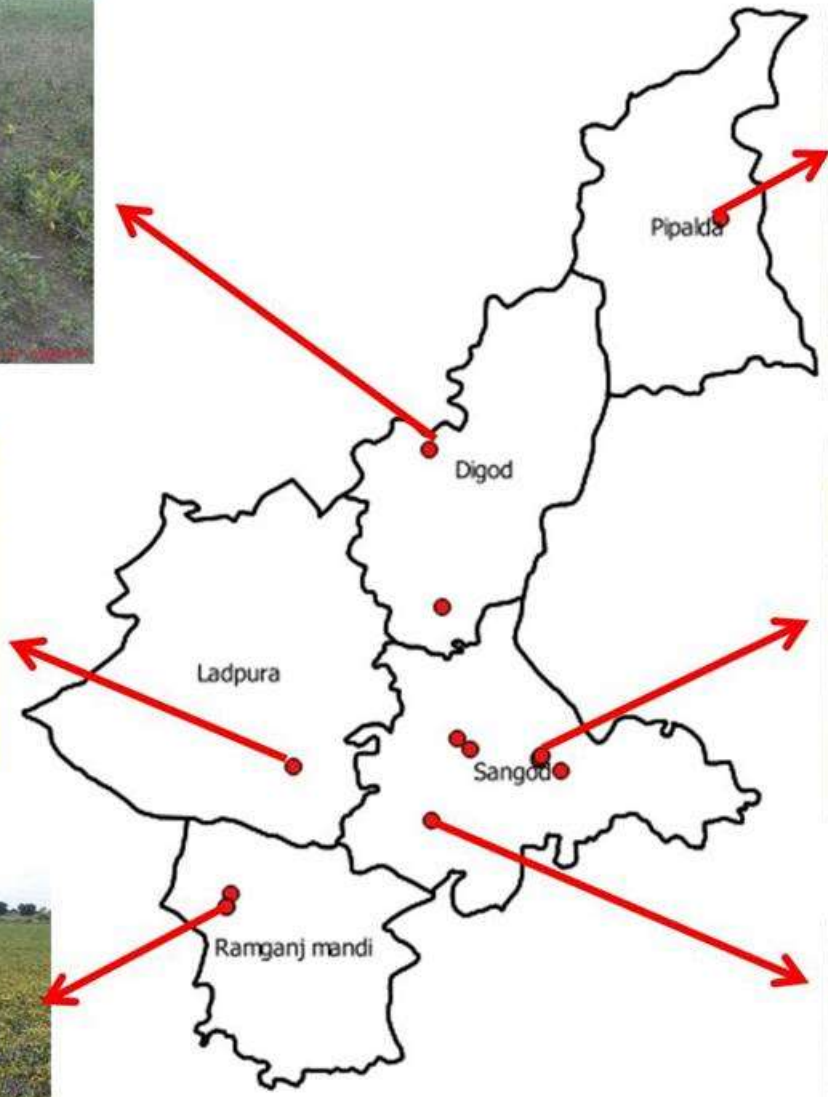
During: Floods

13th and 25th August 2019

End Overlap and side overlap adjusted

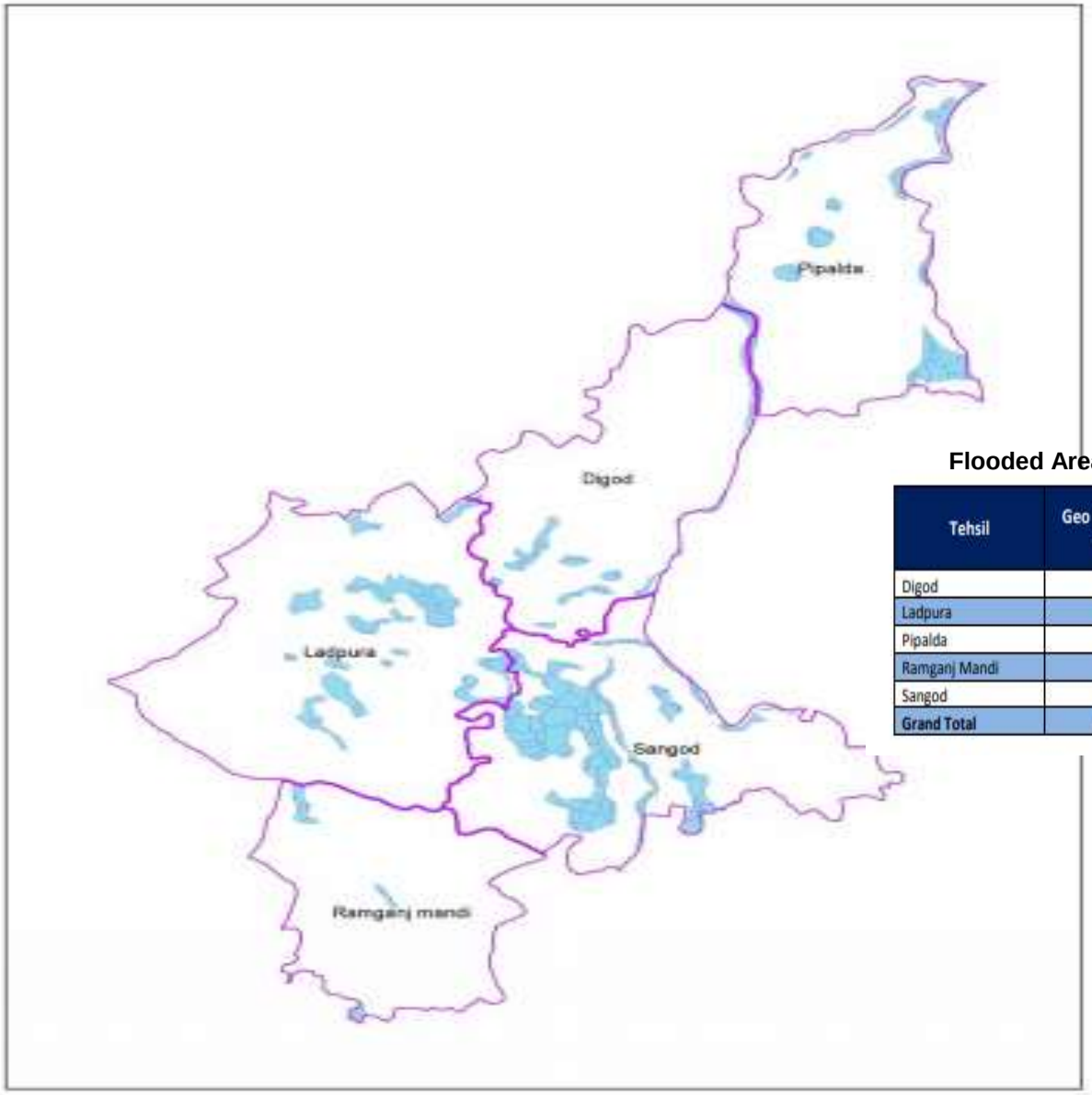
C-Band Sentinel-1

Kota district Flood Survey GPS Points



Kota - Spatial Distribution Map

Flooded Area overlaid with Tehsil Boundaries



Flooded Area 2 Categories: Low & High

Tehsil	Geo Area in Ha	Flood Area in Ha	Low Flood Area in Ha	Total Flooded Area
Digod	40,426	24	6,128	6,152
Ladpura	64,740	2,753	9,707	12,461
Pipalda	42,840	265	7,644	7,909
Ramganj Mandi	7,257		1,435	1,435
Sangod	64,650	20,463		20,463
Grand Total	**2,19,914**	**23,506**	**24,915**	**48422**

Thank you

AGCON

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