

Improving Farm Practices with Automation

Geospatial Applications in Mitr Phol Sugar, Thailand

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THAILAND**



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Outline

1. Sugar Industry Thailand and Mitr Phol
2. Smart technologies in Mitr Phol
 - Mobile Mapping
 - Crop forecasting
 - Towards Precision Farming
3. Challenges and way forward
4. Summary

Thailand Sugar Industry

4th PRODUCER

2nd EXPORTER



53 Sugar Mills



**1.75 million ha
Sugarcane**

Other major crops Area in mln Ha

Rice	10.2
Cassava	1.35
Corn	1.13
Rubber	2.92

Total agriculture land 20.8 mln ha



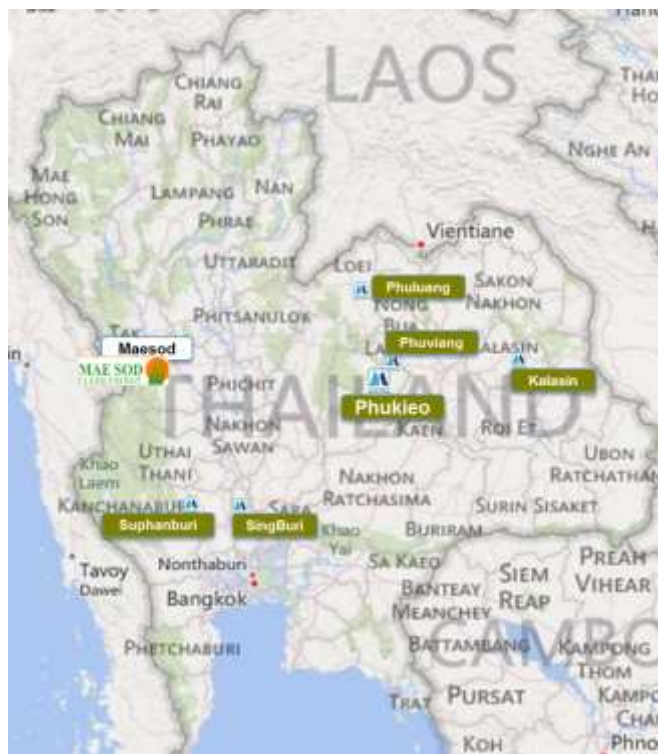
Mitr Phol Group

1st ASIA

5th GLOBAL



THAILAND



6 Sugar mills

1 Sugarcane juice Ethanol

360,000 ha contract farming

70% area <3 ha

Average yield 72-75 t/ha

80% area under rainfed

Mitr Phol in Diversified Green Business

Research & Development



Sugar

... Product of Highest Quality
Friendship with High Value



Pulp & Paper
... Saving the Forest & the Planet for All



Biomass Power

... Lighten the Opportunity for the Clean World



Ethanol

... Renewable Energy Friendly to Environment



Particle Board
... Saving the Forest & the Planet for All



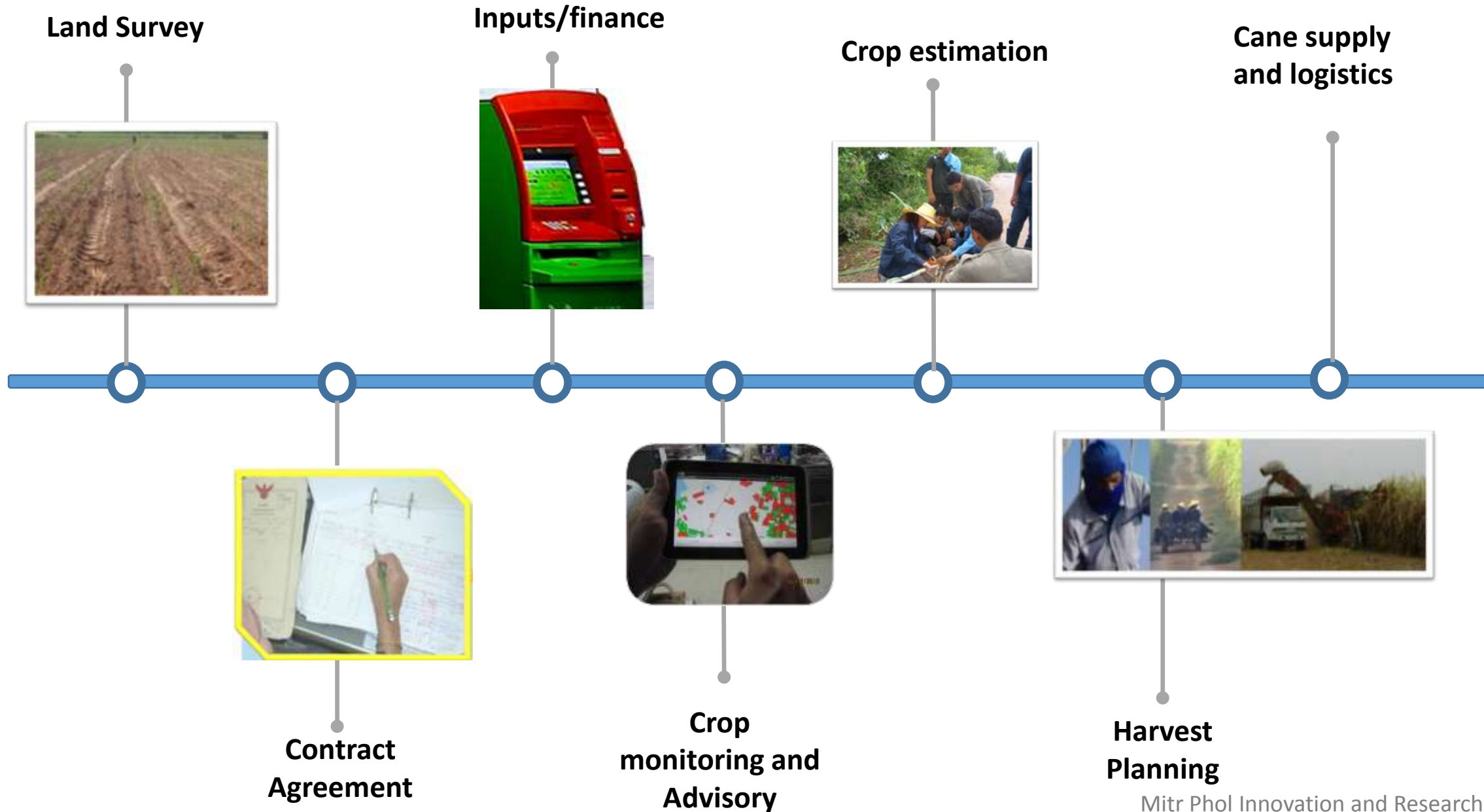
Liquid Fertilizer



“Zero waste”



Crop Management Operations



Growth of Geospatial Technologies

1

Sugarcane Information Management System

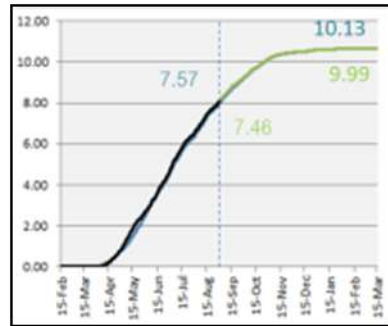


Remote Sensing
GIS
GPS

2002-10

2

Cane Forecast System



Remote sensing
Simulation model
Web data system

2010-15

3

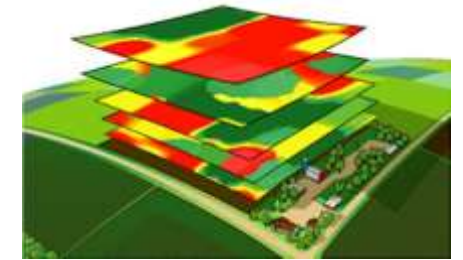
SMART Agriculture

Crop Intelligence (Smart DSS)



RADAR
UAV
Analytics
Scenario Model

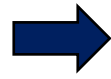
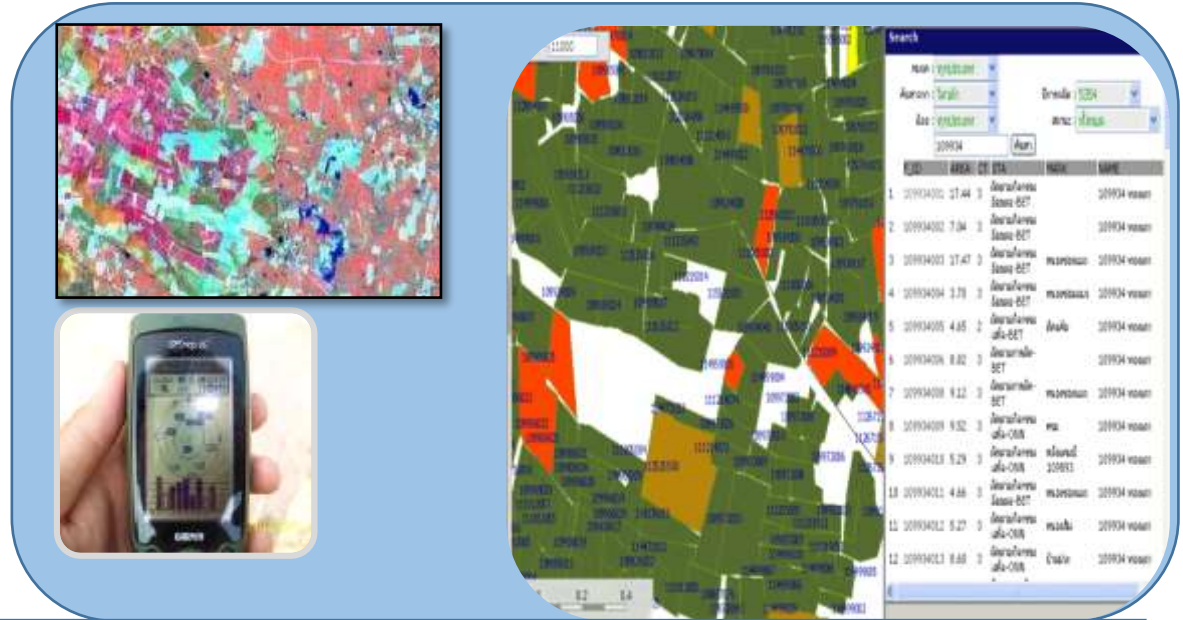
Precision farming
E- farming tools



Weather sensors
Big data Analytics,
Decision tools
Mobile Apps

2016-20

Sugarcane Information & Management System (SIMS)

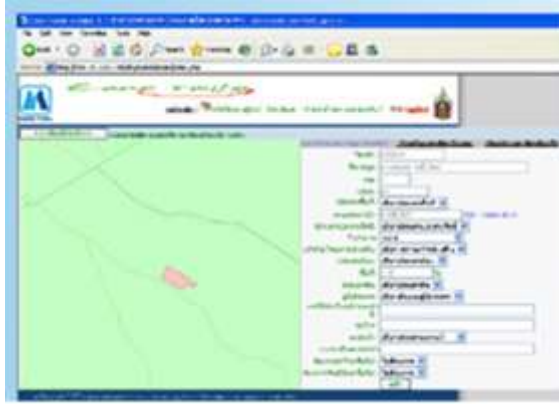



ID	AREA	DT	DTA	MARK	NAME
1	109934001	17.44	3		109934 wanan
2	109934002	7.04	3		109934 wanan
3	109934003	17.47	3		109934 wanan
4	109934004	3.78	3		109934 wanan
5	109934005	4.85	3		109934 wanan
6	109934006	8.82	3		109934 wanan
7	109934008	9.12	3		109934 wanan
8	109934009	9.52	3		109934 wanan
9	109934010	5.29	3		109934 wanan
10	109934011	4.88	3		109934 wanan
11	109934012	5.27	3		109934 wanan
12	109934013	8.68	3		109934 wanan

Finance, Cane quantum & quality online



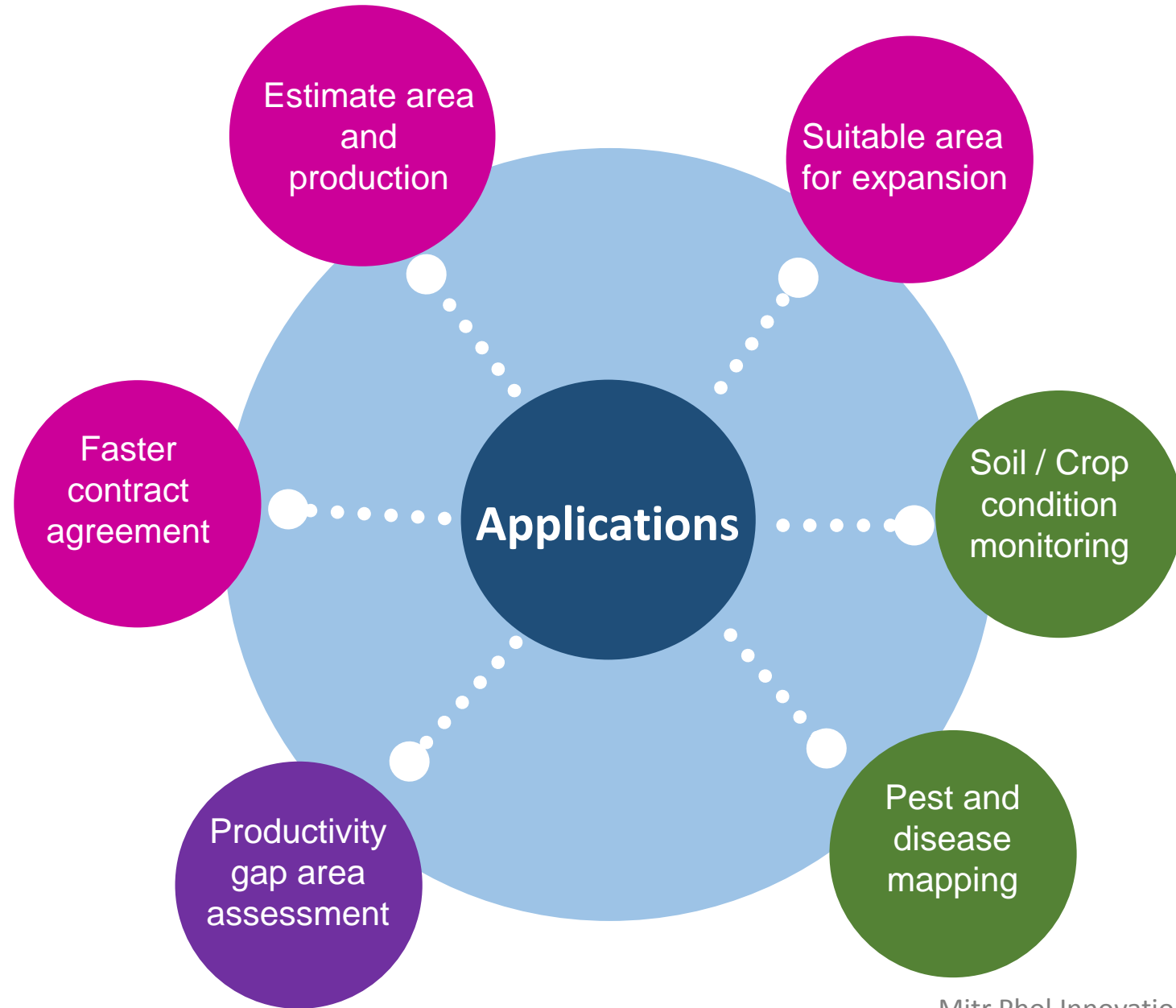
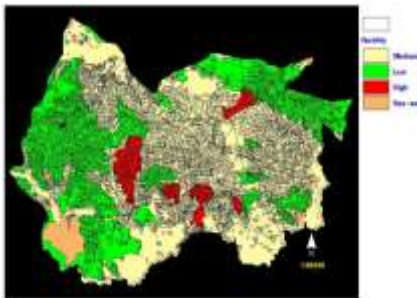
WEB GIS



TABLET Cane Management & Monitoring



Geo-Informatics Applications are





Recognitions



ICT Excellence Award,
Thailand 2008

Geo- Spatial Excellence Award,
GIS World Forum 2011, India



Benefits of Geo-Spatial Technologies

Problems before SIMS

- Where is the field ?
- Does it really exist ?
- How much exact area ?
- Crop estimation is inaccurate
- Finance outstanding rate was high
- Reporting takes longer time

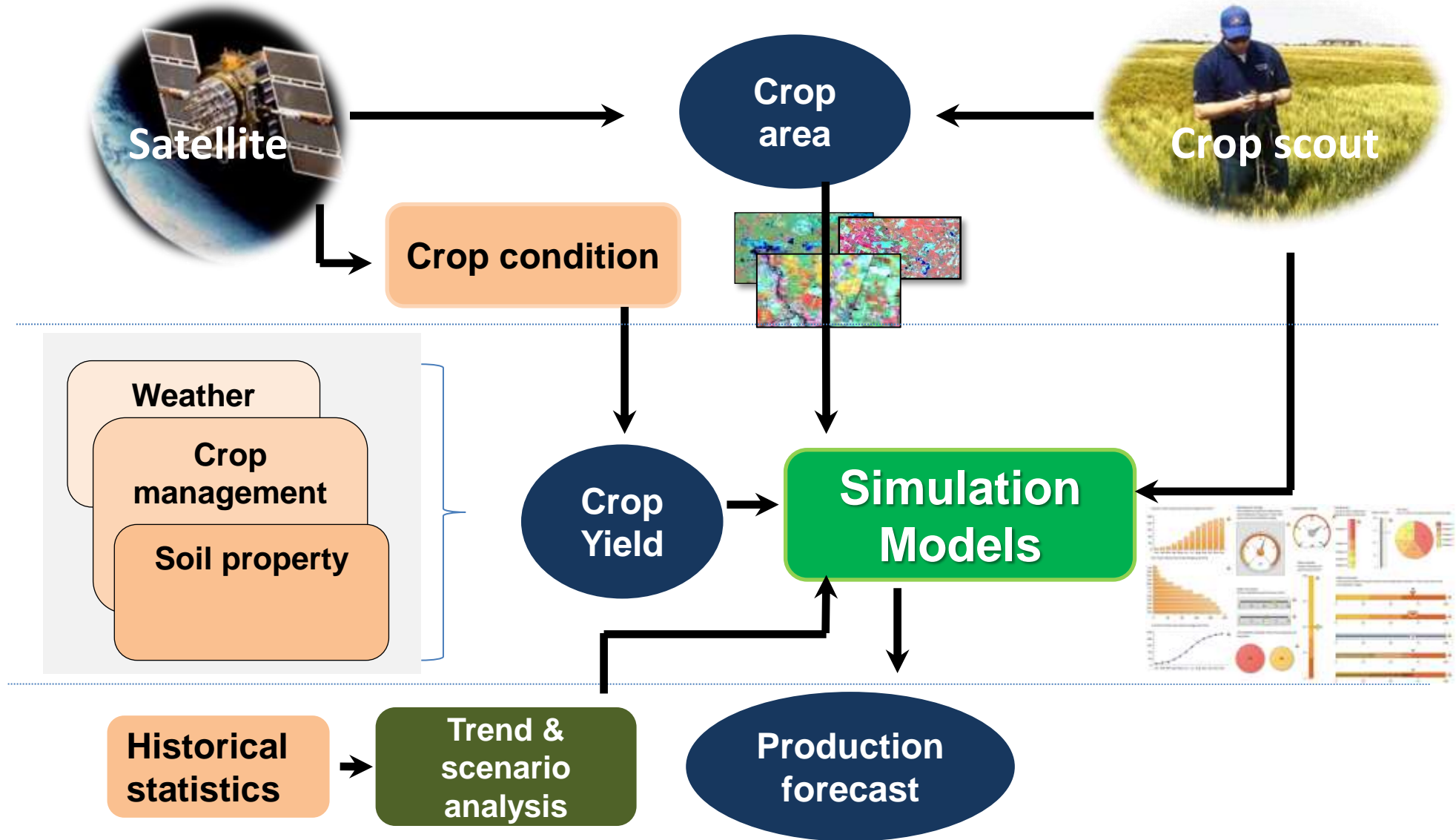
Solutions

- GPS based field level mapping
- Farmer, Farm and field data entered using mobile
- Real time connectivity
- Satellite for crop health harvest / monitoring

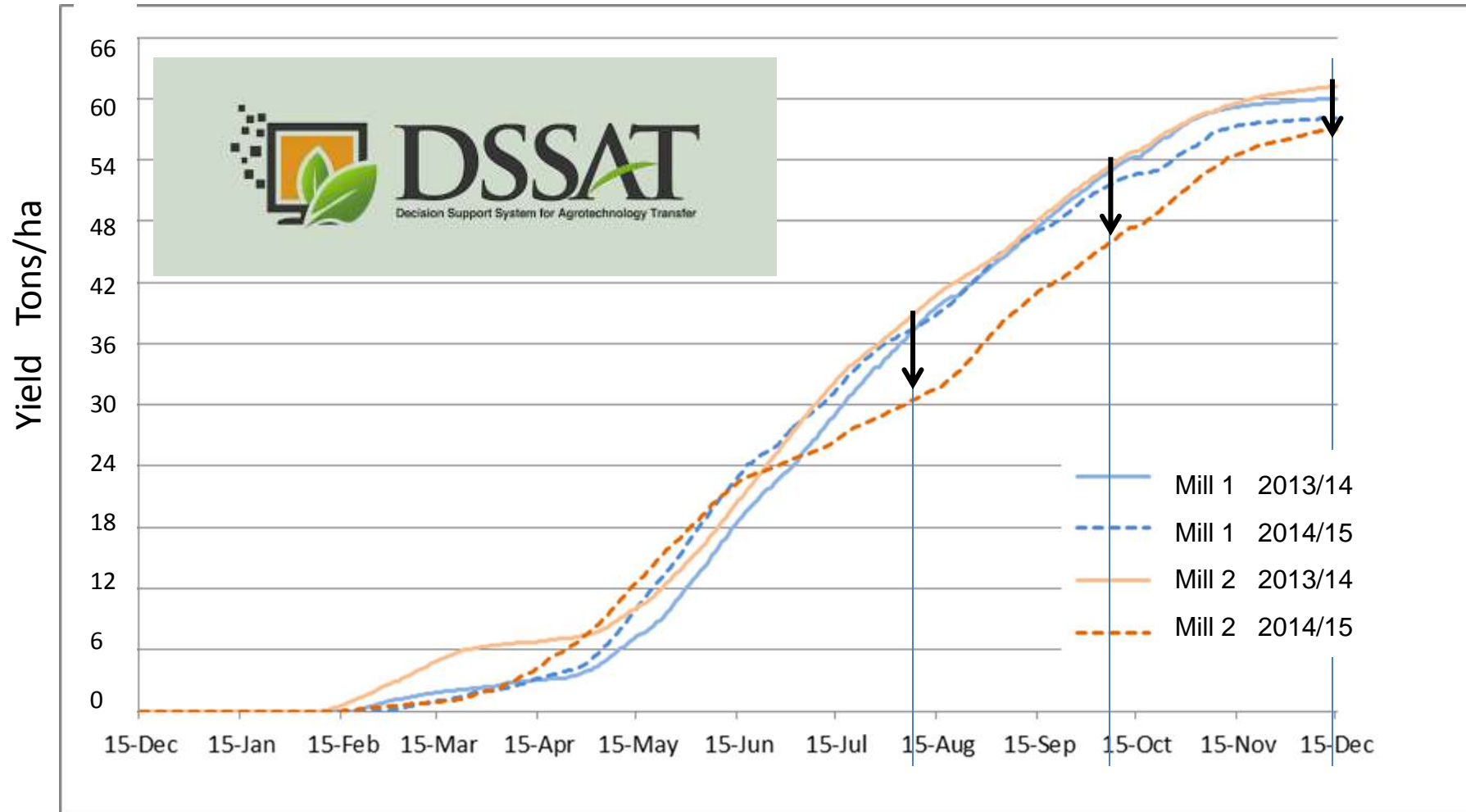
Benefits

- Field mapping with accuracy more than 97%
- Reduce loan processing time 16 days to 3 days
- Online field scout saves time and reduce error
- Improve farmers cane yield 2-5%
- Efficient planning, monitoring.

Crop Production Forecast System



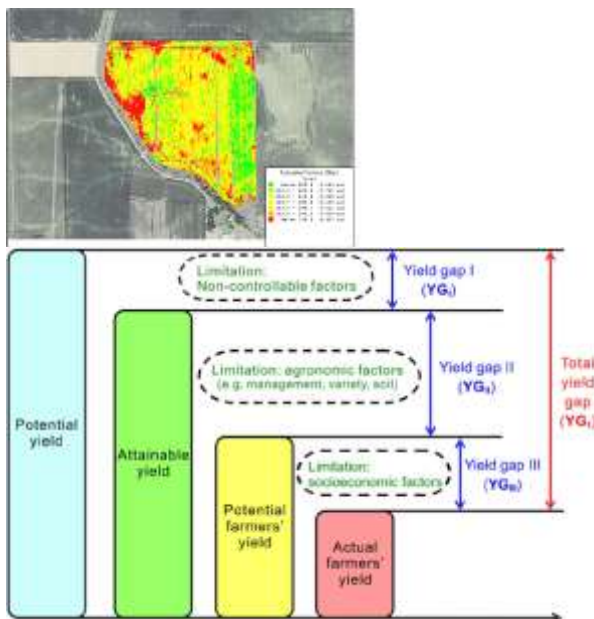
Production Simulation



Estimated accuracy of 93% at regional scale average in 3 years

Precision Farming is

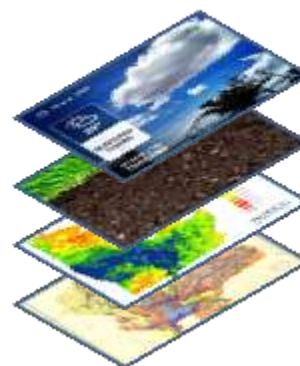
Yield variability within Field



Benefits

- Optimize Yield and Profit
- Optimize Resource
- Save Environment
- Sustain Raw Material

Determine the factors



Weather

Soil property

Nutrient availability

Soil Moisture

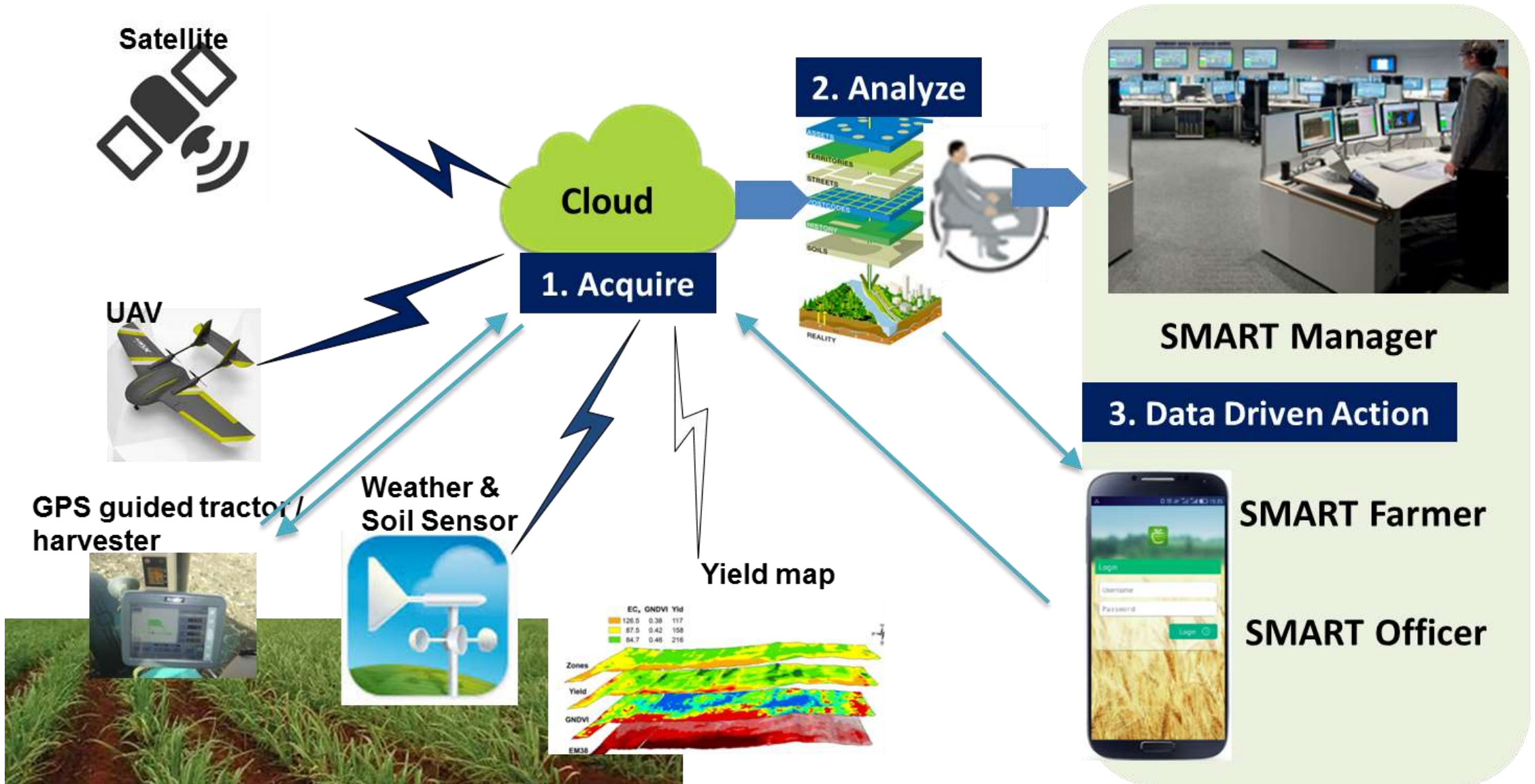
Variety

Crop Management

Action 4 Pillars

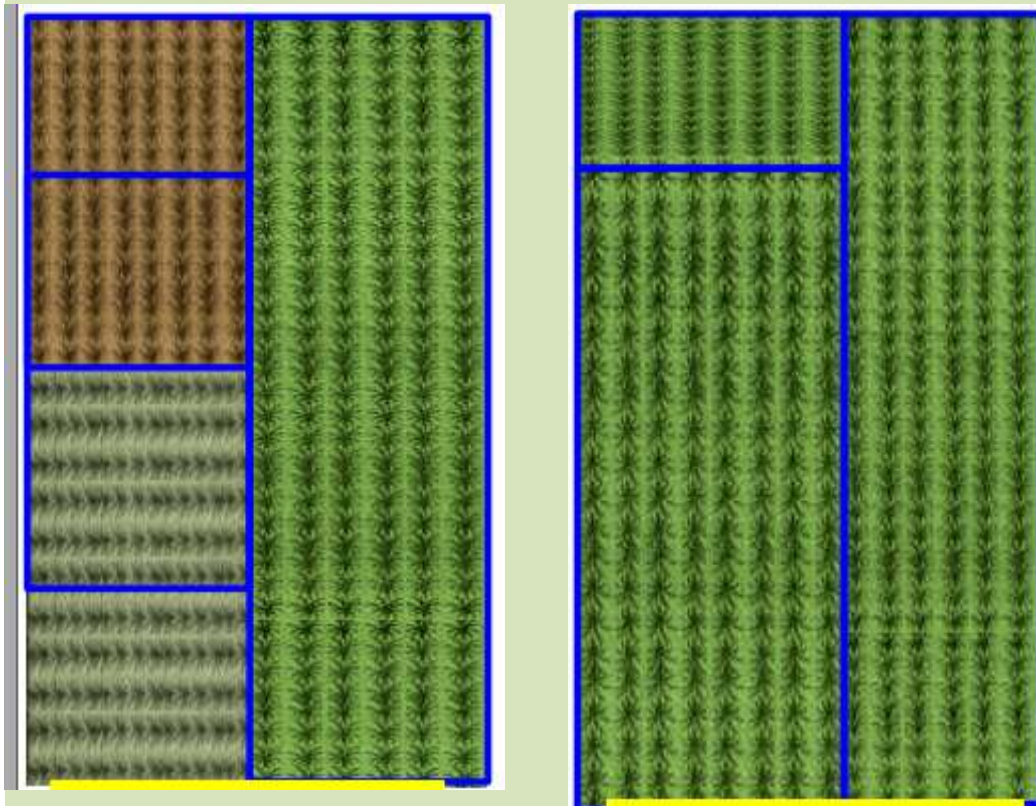
- Right Thing
- Right Time
- Right Amount
- Right Place

Our Frame Work of Precision Farming



GPS guided farm operations

Land Consolidation



Field lay out design changed to facilitate mechanization using GPS guided tractors (RTK + Base station)

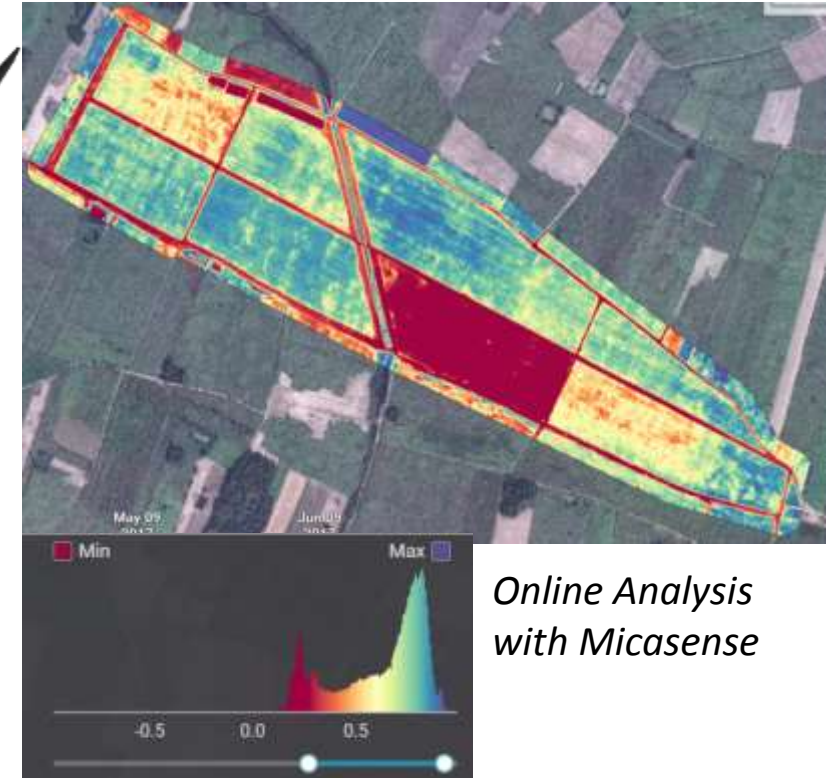


- Contour planting
- Controlled traffic (less compaction)
- Reduce cost of cultivation
- Improves Yield

UAV in Large Farms



Vegetation health monitoring



*Online Analysis
with Micasense*

- Contour planting
- Plant density detection
- Crop health
- Crop height

NDVI Normalized
Difference
Vegetation
Index

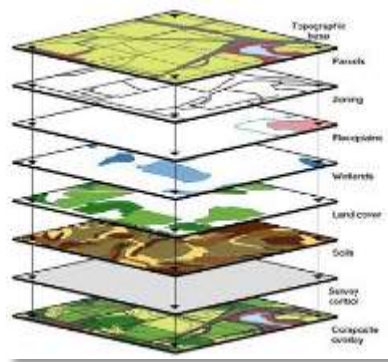


Challenges

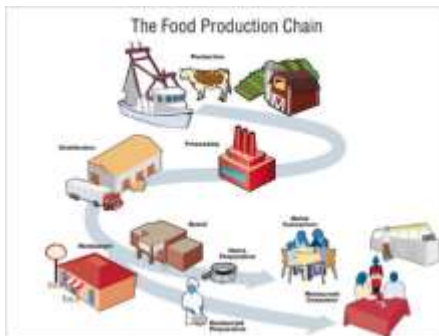


“ONE SIZE DOES’NT FIT”

Smaller farms requires consolidation / co-operative farming approach to make PF cost effective

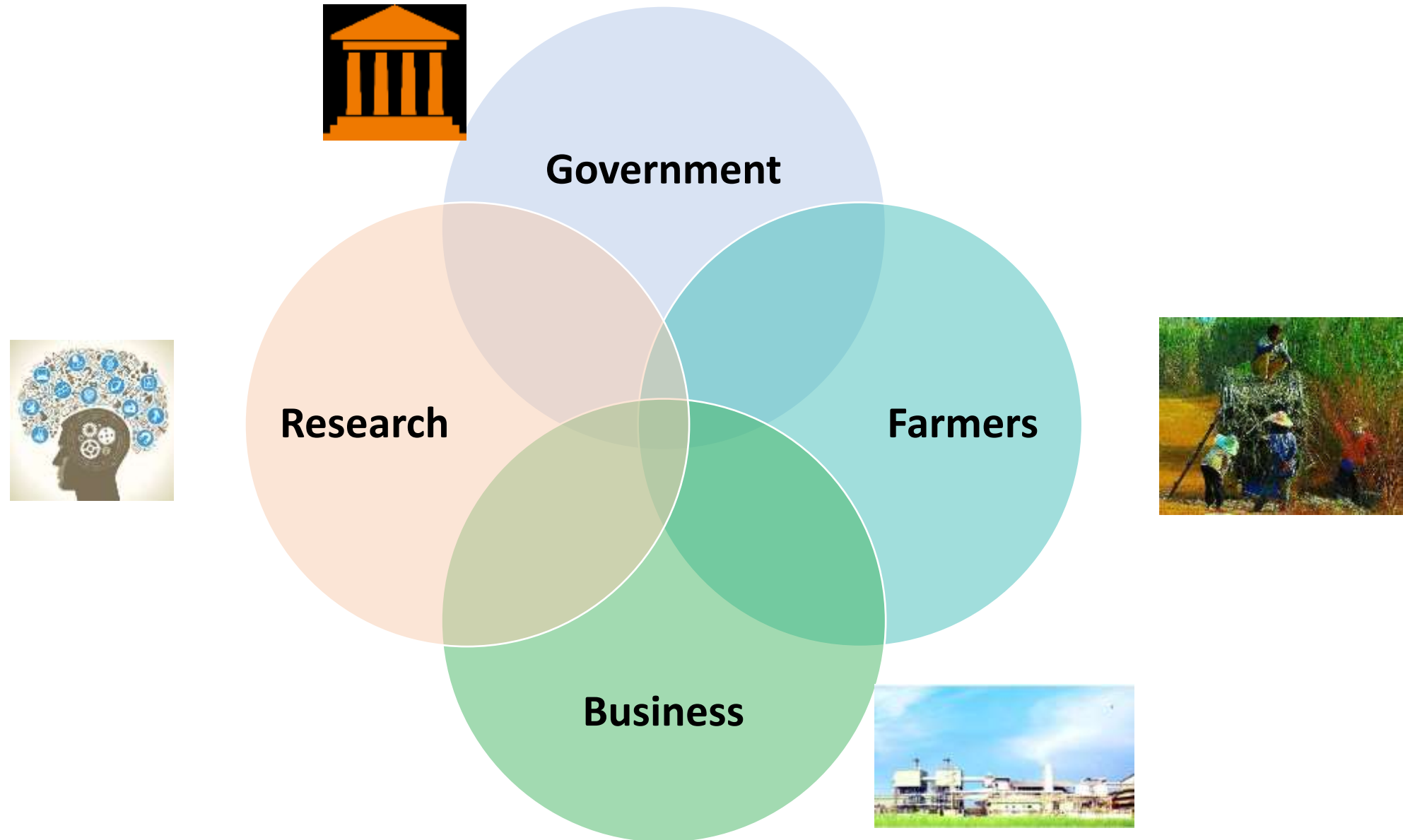


Generating huge amount of field data. How to effectively integrated with other data sources for convert into valuable and actionable information



Information and services just-in-time throughout “Food value chain” from Farm to market/ Consumer are vital

Collaborative approach



....with Open innovation and collaboration

Summary

- Since 2002 Mitr Phol Group applied Geospatial technologies progressively
- Realized **significant benefits** to both farming community and business
- Implementing new technologies towards modern and precision farming in larger farms
- Challenge ahead is **“high tech for small farms”**
- Mitr Phol Innovation and Research Centre **collaborate with institutes** for faster innovation and adoption



Thank You for Kind Attention

ACKNOWLEDGEMENT

MITR PHOL Innovation and Research Centre

MITR PHOL Plantation

MITR PHOL Cane GIS

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