



Precision Agriculture

# Towards Agriculture 4.0

Integrated Smart Farming & Big Data Analyst  
PT. Great Giant Pineapple

# Where Are We



## GREAT GIANT PINEAPPLE

- ✓ Located in Lampung Province, Lampung Tengah Regency
- ✓ Established in 1979, cultivating cassava plant and in 1980 started planting pineapple. Company exported canned pineapple in 1984
- ✓ 30.000 Ha of pineapple plantation
- ✓ Global distribution network with export to more than 60 countries

# GGF in Lampung



## PT. GGP

- **Commodity**
  - Processed & fresh pineapple, banana, guava, cassava, etc
  - Canned pineapple
  - Pineapple juice concentrate
  - De-ionized clarified pineapple concentrate
  - Canned tropical fruit salad
  - Fruit in cup

## PT. Bromelain

- JV with Enzybel International S.A.
- Produces bromelain enzyme 120 MT from pine stem 24,000 MT per annum



## • PT Umas Jaya Agrotama

- Tapioca starch producer with annual production capacity of 60,000 MT of starch



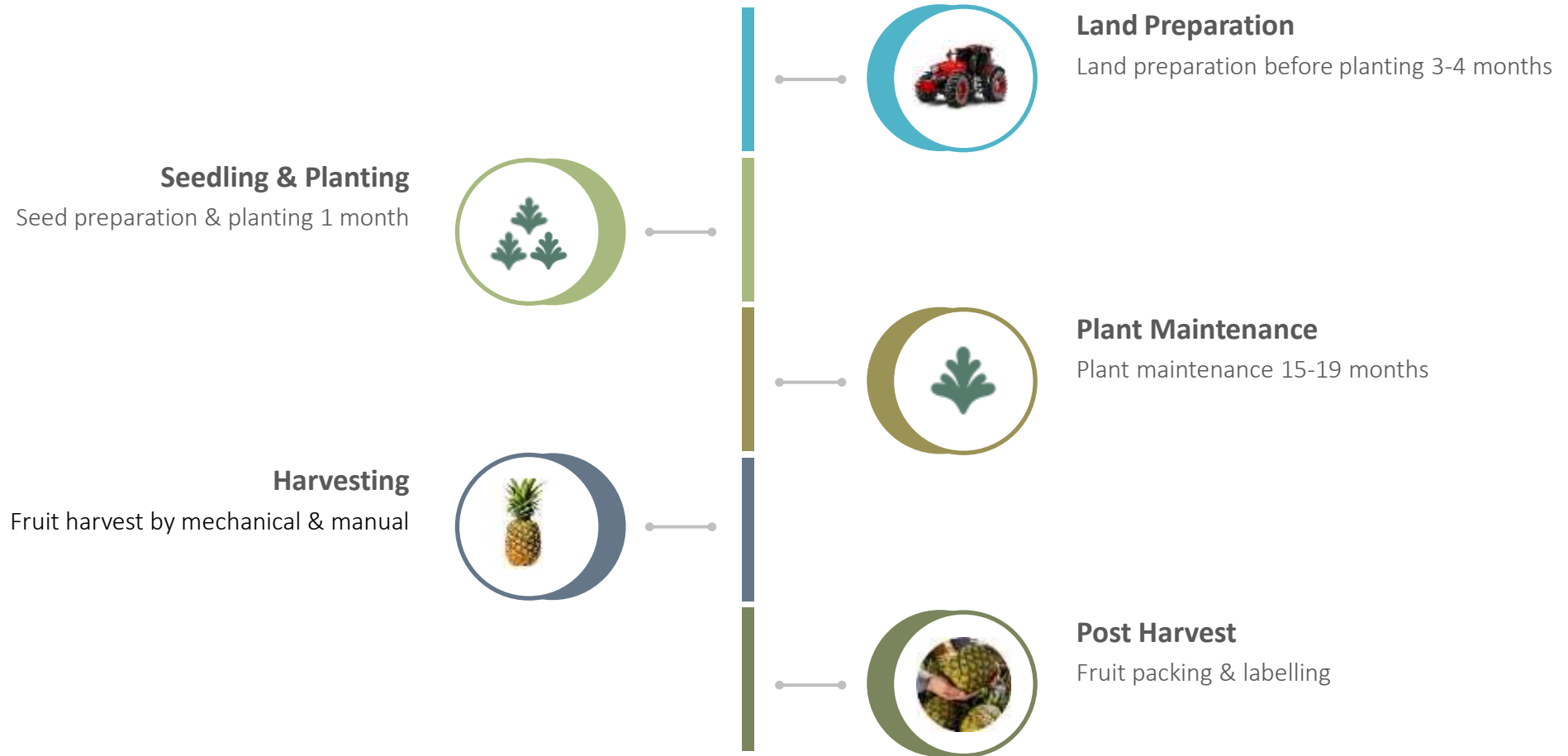
## • PT Great Giant Livestock

- Feedlot with annual capacity of 25,000 heads of cattle
- Feedlot area integrated within the pineapple plantation





# Pineapple Process Flow



# AGRICULTURE TRANSFORMATION 1.0 TO BE 4.0



Agriculture

1.0

- Since year 1920
- farmer used manual tools to maintain the plant
- Traditional farming
- More for fulfill family needs



Agriculture

2.0

- Since year 1921-2010
- farmer used tractor, fertilizer, seed.
- Produce more result
- More efficient time
- Farming for industry



Agriculture

3.0

- > 2010
- High utilization of sensor, cloud computation, software,
- automation electronic base which integrated to farming system



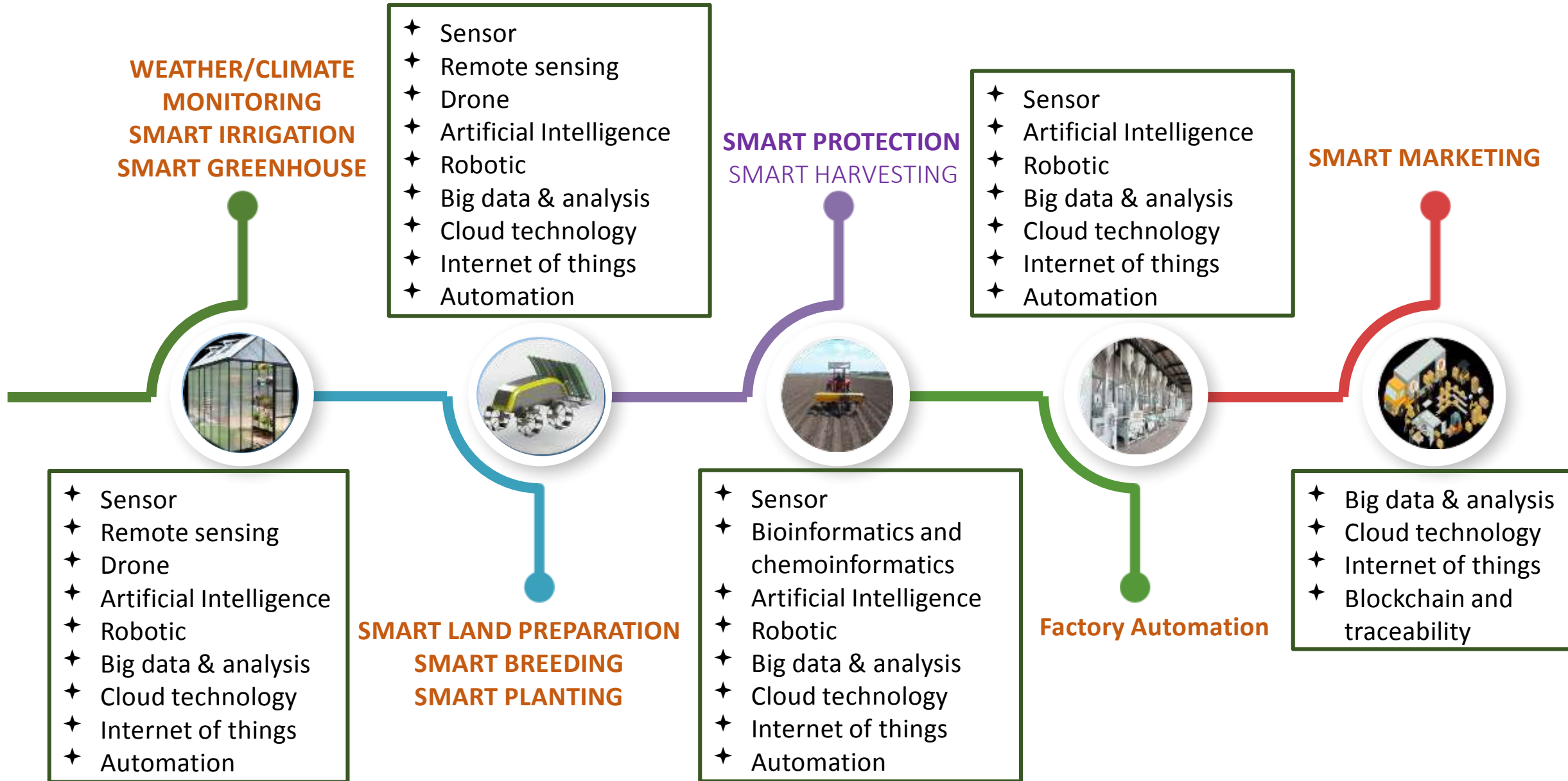
Agriculture

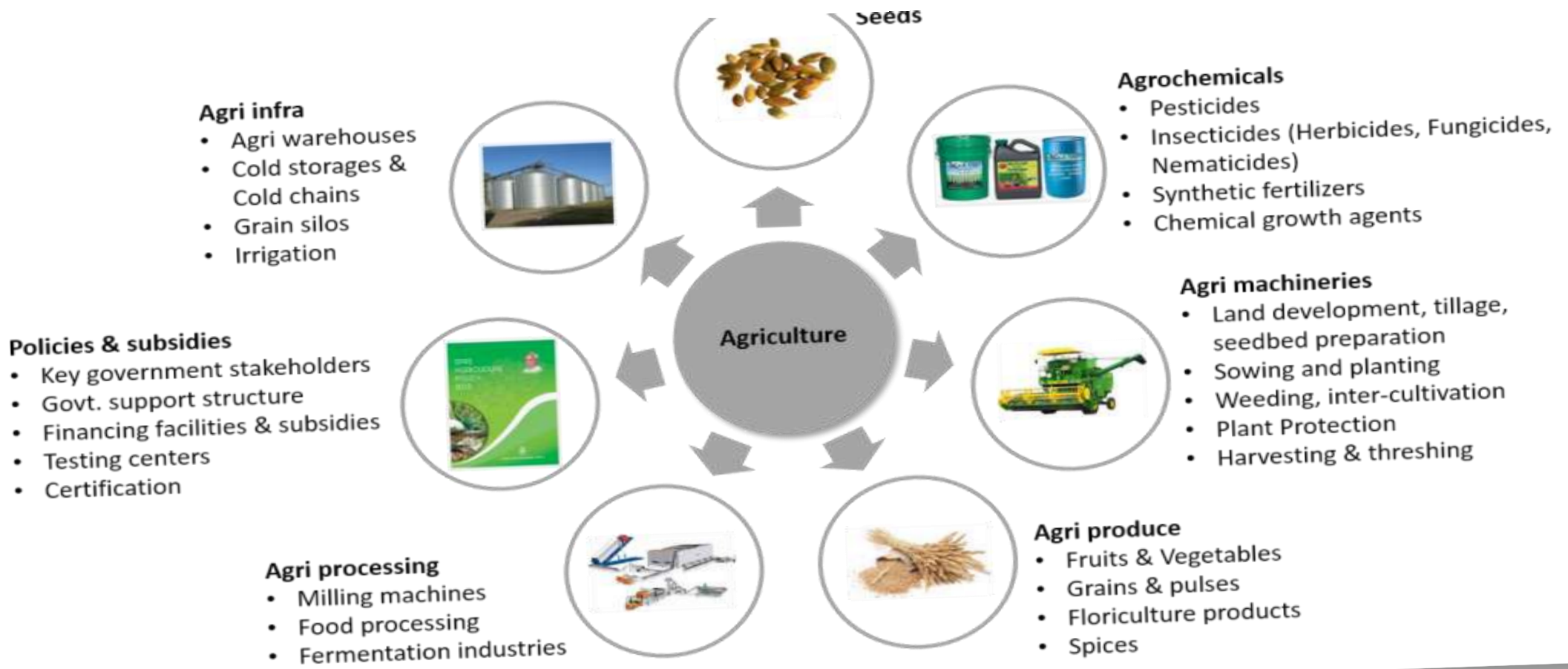
4.0

- >2010
- AI (Artificial Intelligence) implementation
- Apply precision farming
- Developing management information system
- IOT, Big Data Analysis, connected farm



# Implementation of Smart Agriculture 4.0





# IoT in Smart Agriculture



# IoT in Smart Farming



# SMART AGRICULTURE CONCEPT





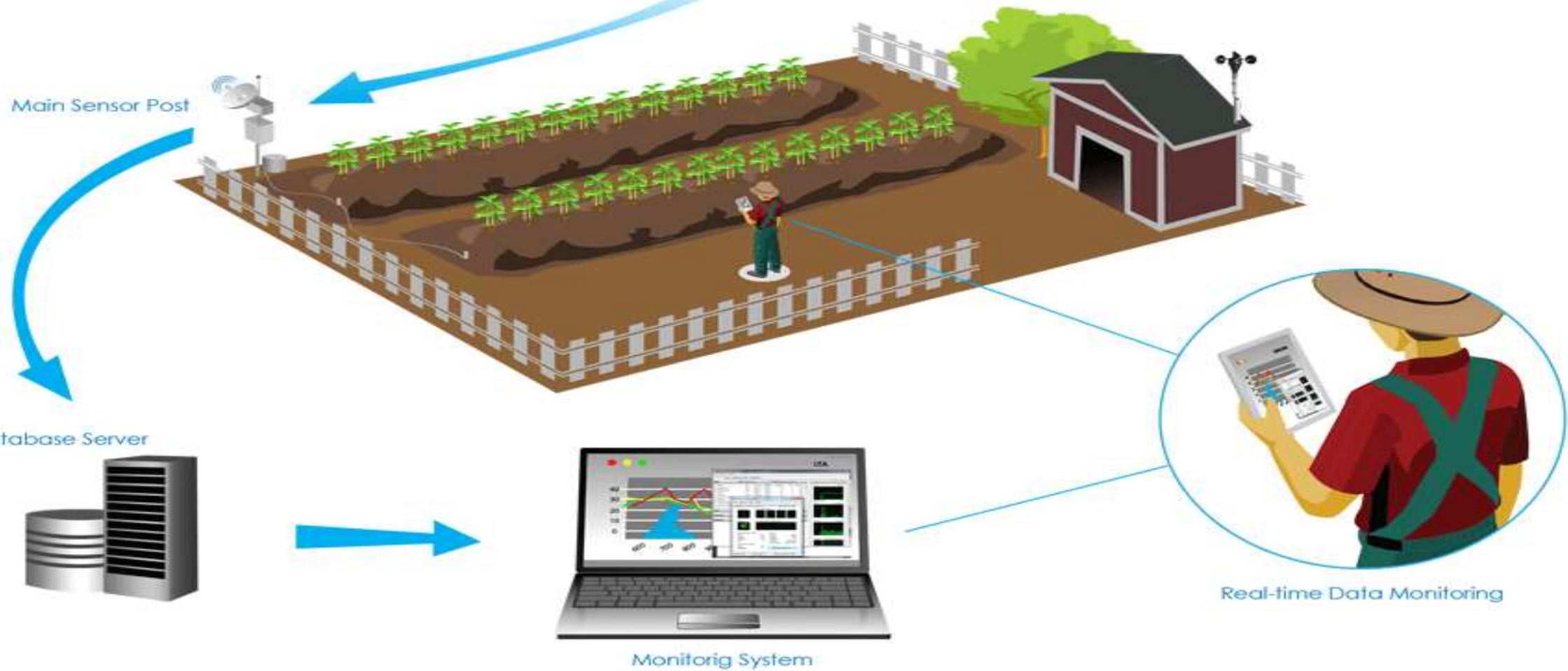
Crops & Soil Monitoring



Weather Monitoring



Air Monitoring



# Agricultural Partnership for Rural Youth Development

## A GRICULTURE PROBLEM



### Agri is not Attractive to the Youth :

Average age of farmers in Japan: 70 years

Average age of farmers in Philippines: 57 years

Average age of farmers in Thailand: 54 years

# Why Agri is not Attractive to the Youth ??

- 1** **A 48%** No money from farming / low income / unstable work / high risk / no prospects
- 2** **B 34%** Rural life is boring, no “entertainment”
- 3** **C 22%** No pride and dignity in farming, low self esteem



# RitX Bertani ...



Asking Expert: Voice Command



Weather Monitoring Via BMKG Satellite



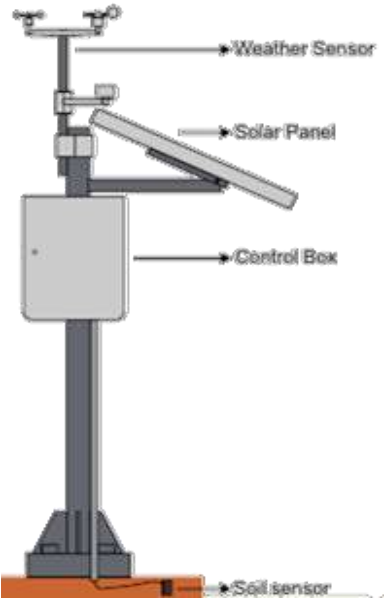
Soil & Weather Monitoring By RITx Sensor



Recommendation For Farmer



Historical Good Agriculture Practice (GAP)



# RITX Bertani



# TaniHub...



# TaniHub

connecting farms with people



Welcome to TaniHub

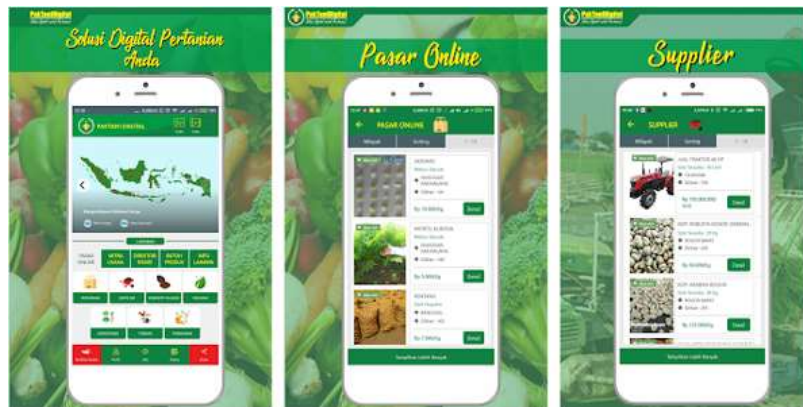


Choose product category

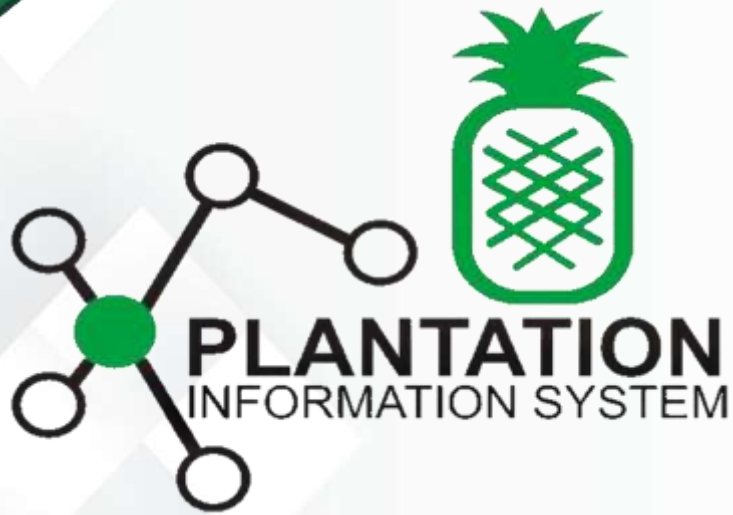


Buy fresh products  
directly from local farmers.





**Pak Tani Digital ...**



Towards Agriculture 4.0

# PT. GGP Sustainable Agriculture with Precision Farming

Land Prep



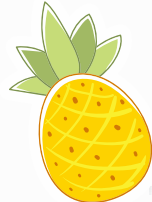
Planting



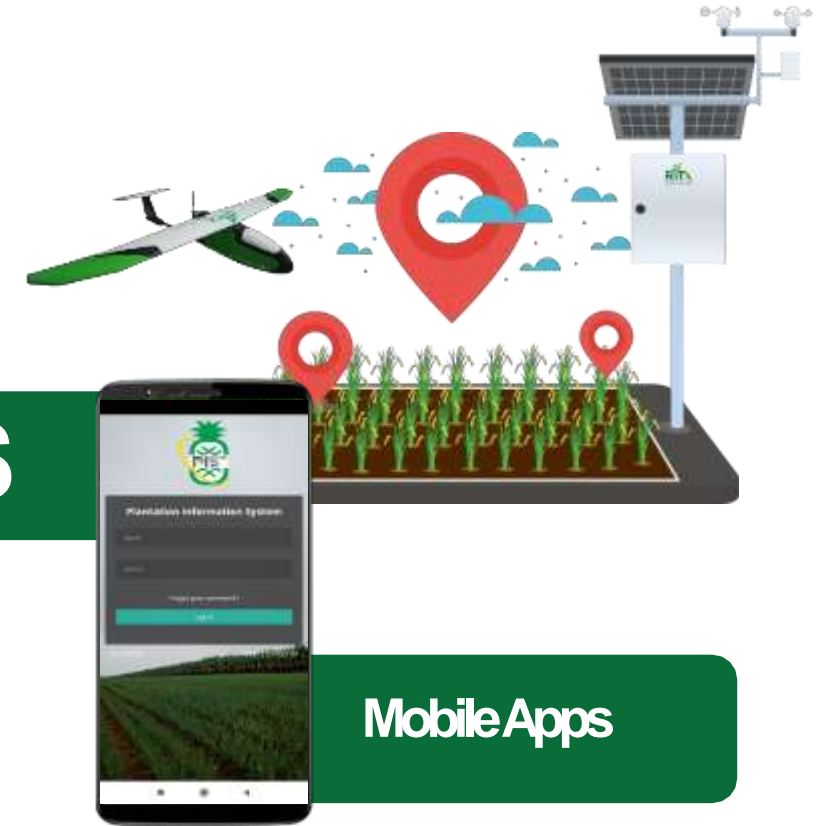
Plant Maintenance



Harvest



PIS



Mobile Apps

## “Plantation Information System”

# Land Preparation



- Water Manag. Maps
- Ridger Quality
- Web Gis (IoT)



Water Direction



Water Flow



Flood Potential



Water logging



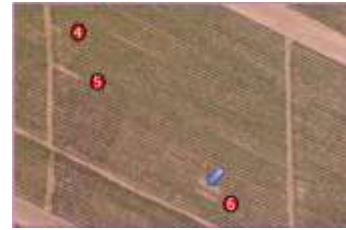
Ridger Quality Index



# Planting



- Planting
- Counting (AI)
- Ant Bait



Planting Quality Control



Plant Density Counting



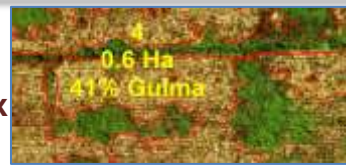
Ant Bait Application from manual to drone spreader



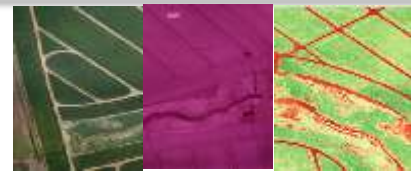
# Plant Maintenance



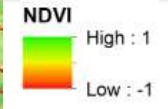
- Weed Control
- Vegetation Index
- Sensor & IoT



Weed Control



Vegetation Index Monitoring



Sensor & IoT (Air Temperature)

# Irrigation



- Measure Lagoon
- Water Level
- Soil Moisture



Water Volume Measurement



Water Debt Monitoring

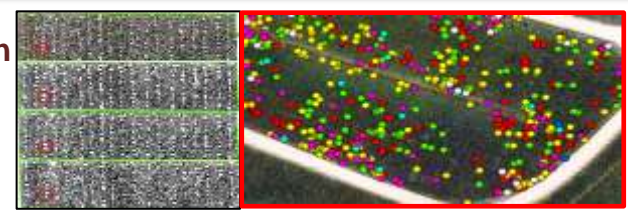


Sensor & IoT (Soil Moisture Index)

# Harvesting



- NDF Distribution
- Water Quality



Calculating NDF Distribution



Water Quality Monitoring



# How it works

**1** Multi Rotor UAV self-flies by built-in GPS, collects multi spectral photos and LEX positioning data

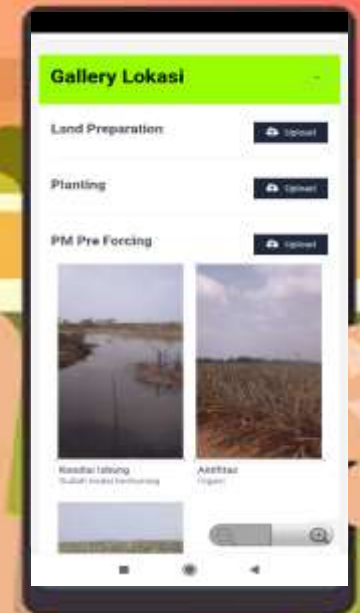


**2** Send multi spectral photos

- 3** Create NDVI map
- 4** Extract places of weed from NDVI map
- 5** Make UAV's navigation data for UAV spot-spray



**6** Send places of weed

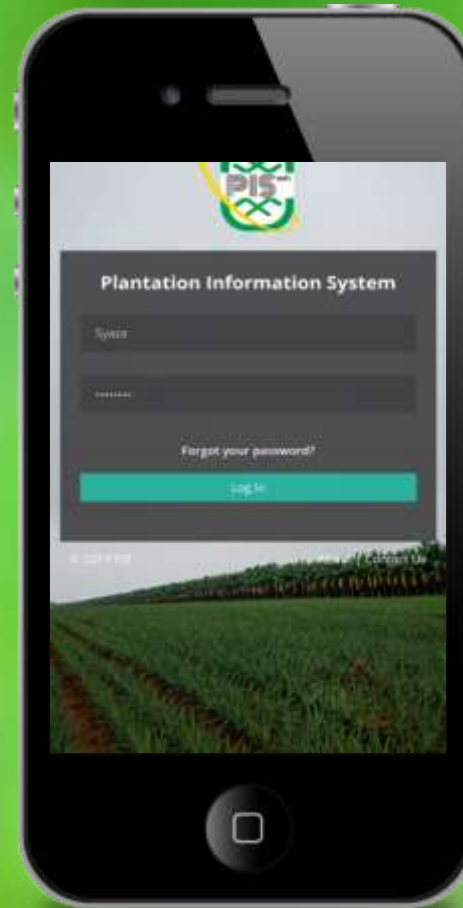


**7** Compare with real condition



# Plantation Information System

PIS is Smart agriculture mobile apps which used in PT. GGP to monitor, control, simulation, and decision making of every single location even plot.



01

Real time plant pest monitoring

02

Real time fertilizer, fungicide, herbicide, and insecticide usage per location

03

Production & cost rolling forecast

Trend of plant gain and plant health information

04

Irrigation coverage area & water needs information

05

Yield, cost, and irrigation historical data

06



Login Page



Main Menu



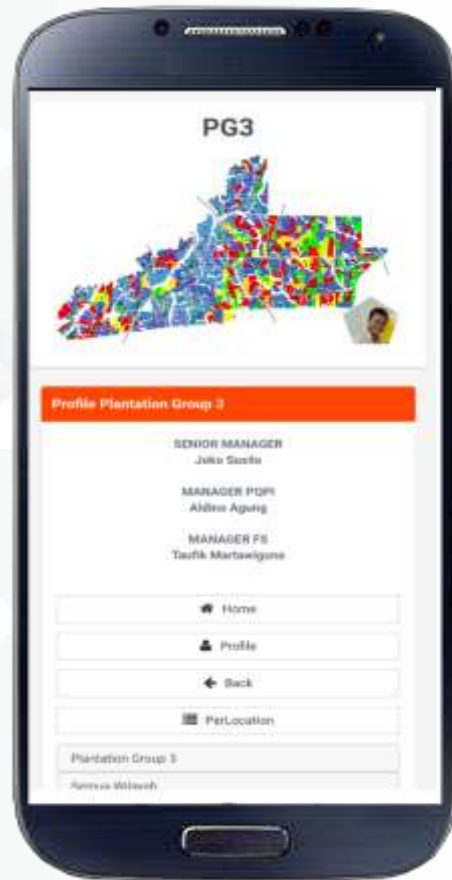
User Profile & Information



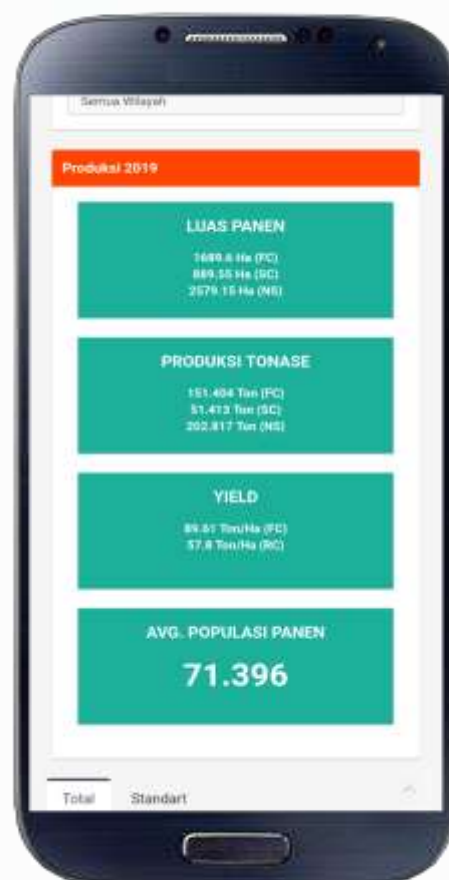
Cost Dashboard



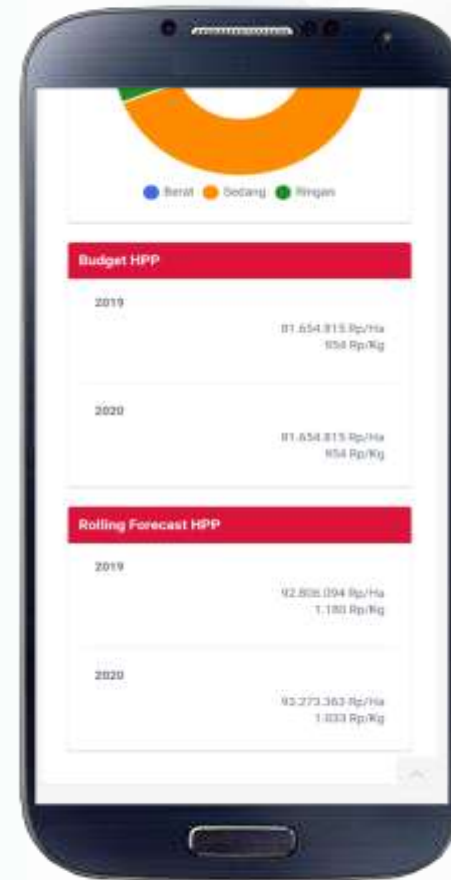
Performance  
Dashboard



PG3 Farm Detail  
Information



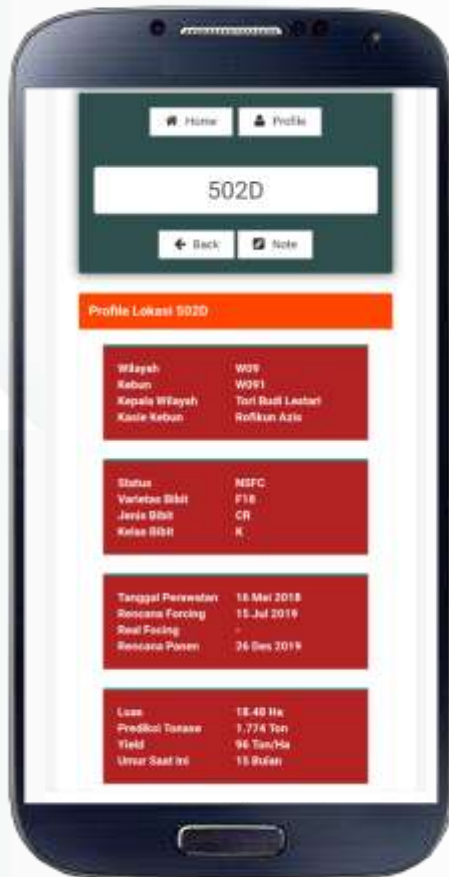
Production &  
Yield Estimation



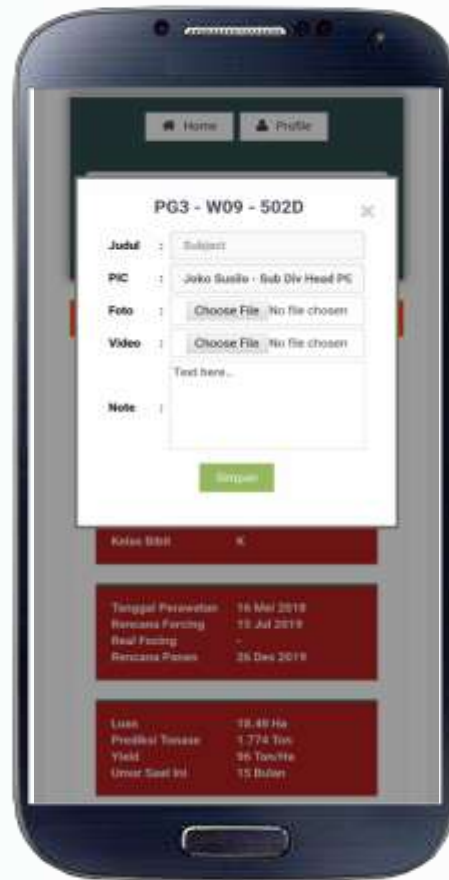
Cost Estimation



Cost Rolling Forecast



Details Information of Location



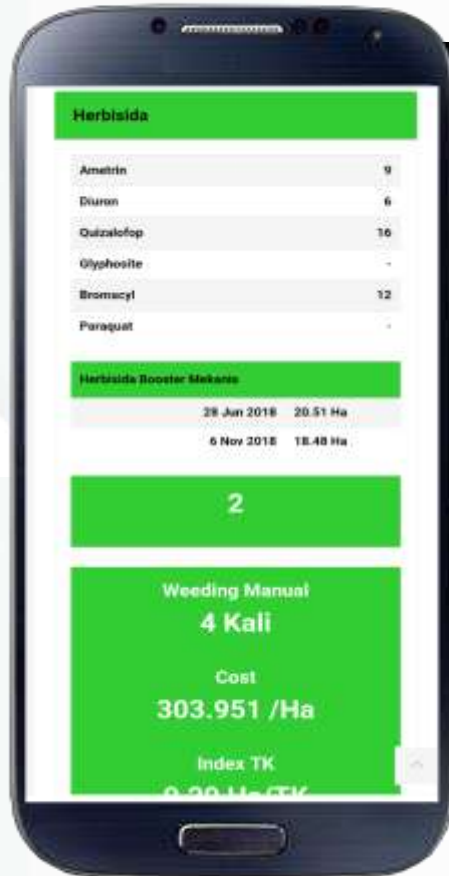
Location Issue



Irrigation coverage info



Plant Pest Info



Herbicide Usage



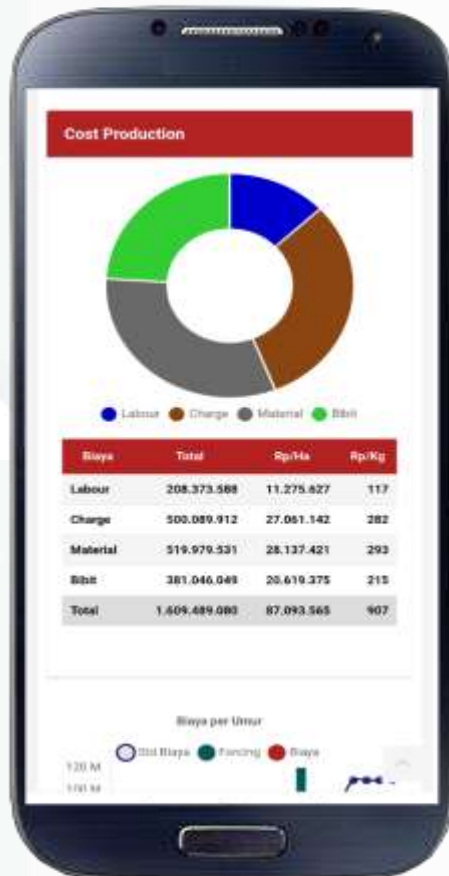
Fertilizer Usage



Foliar Spray Info



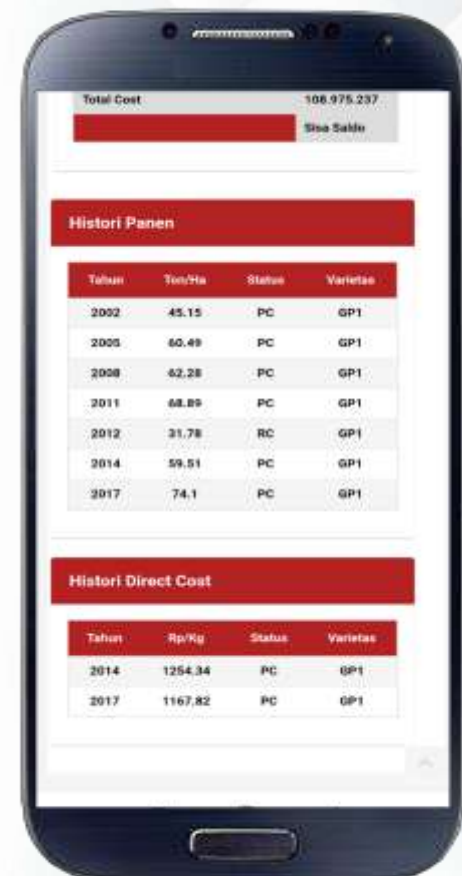
Real Harvest  
Progress



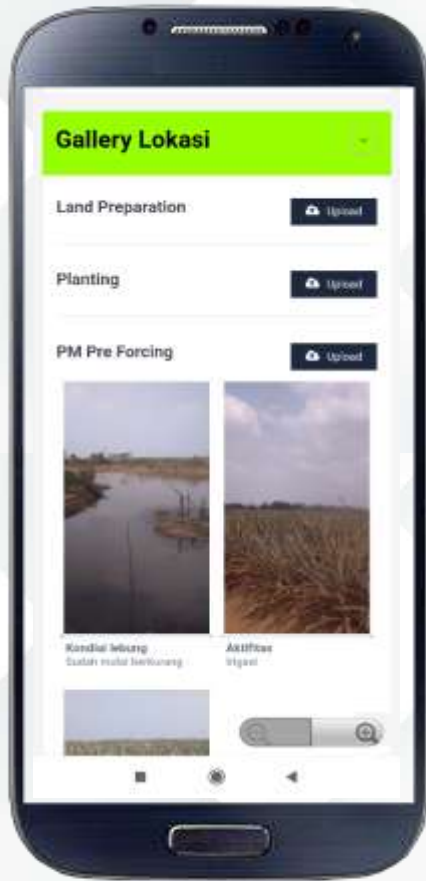
Real Cost Update



Real Cost Per  
Plant Age



Historical Yield



Location Gallery



Cost Simulation



Real Time  
Location Info



Irrigation History





Thank You!

