# DRAGONFLY

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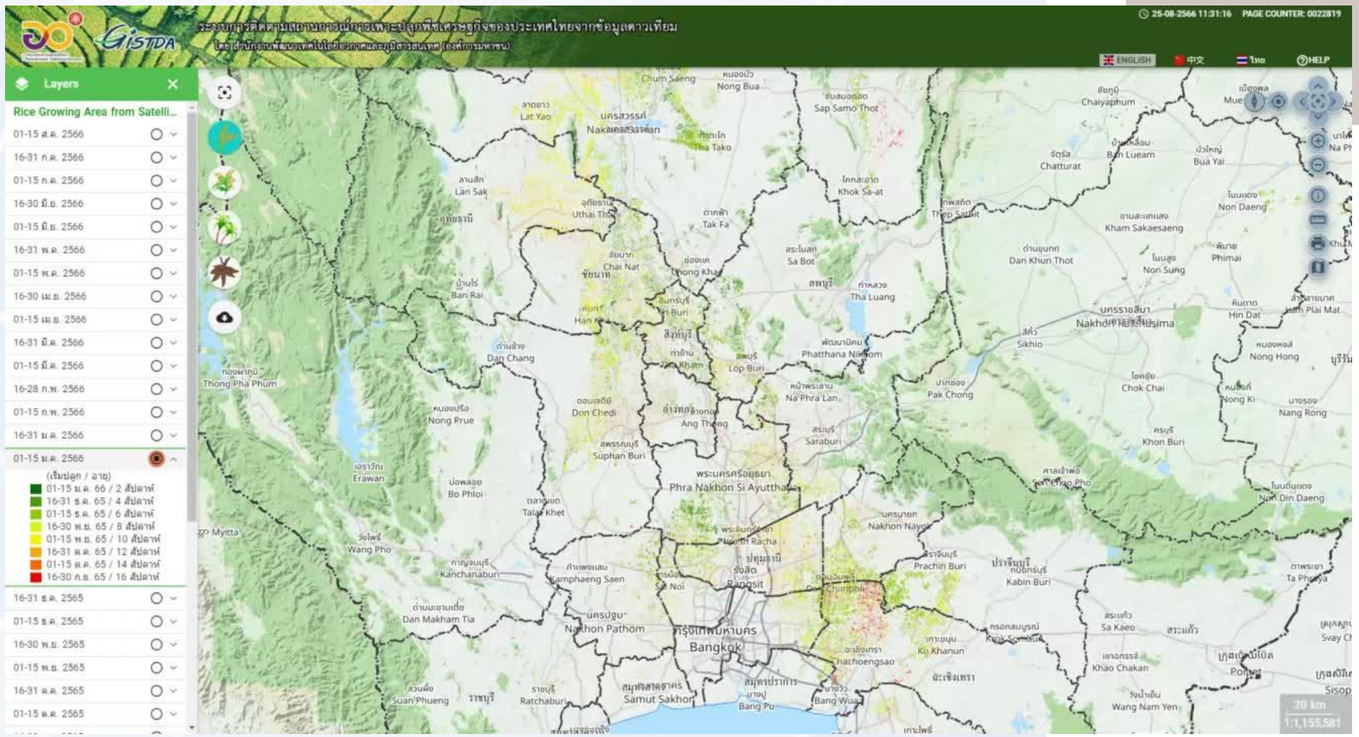
*Head of Agricultural Economics and Geo-Social Division, GISTDA, Thailand*

# 6 Economic Crops

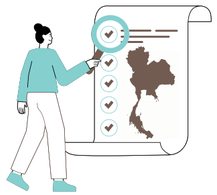
## Monitoring System

gisagro.gistda.or.th




**Bi-weekly:**
Rice, Maize, Sugarcane, Cassava

**Annually:**
Para Rubber, Oil Palm



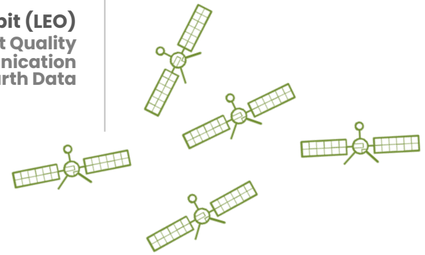
**Nation-wide**

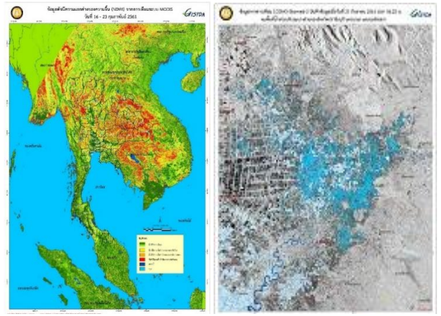
**Skilled Users:**
Public, Private, Education

## at Country Level

# Weekly Individual Plot Farmer ?

**Low Earth Orbit (LEO)**
Satellite Internet Quality
IoT Communication
Big Earth Data



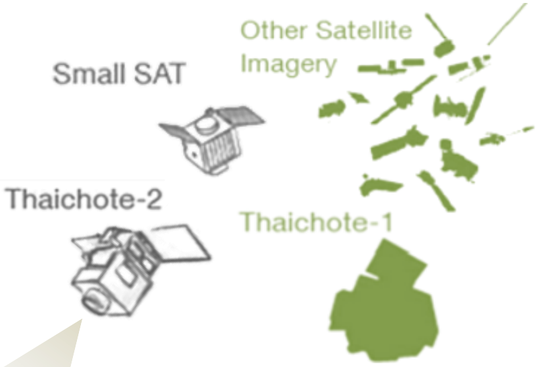


Small SAT

Other Satellite Imagery

Thaichote-2

Thaichote-1



Drones

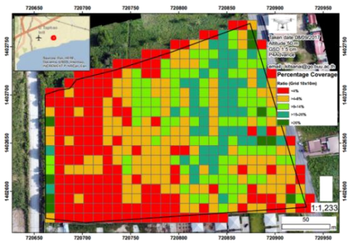
**Climate Change**
Flood & Drought
Crop Resilience & Adaptation

**Crop Monitoring**
Crop Identification
Crop Growth
Crop Conditions
Yield Estimation
Damage Assessment

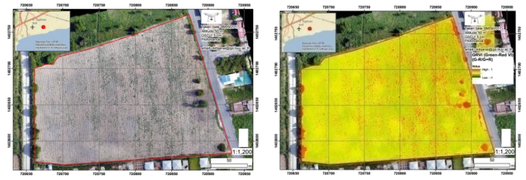
**Dragonfly**


**Crop Models & Agronomic**
Yield Prediction
Fertilizing & Water Use
Disease and Insect Simulation

GISTDA PORTAL

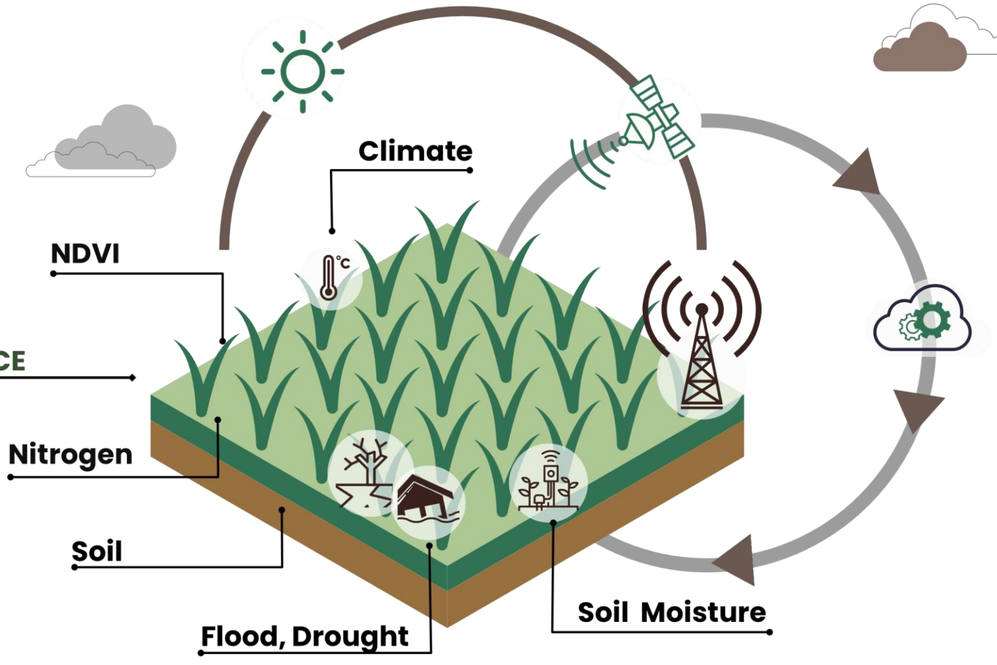


**Farmers**
Yield & Production
Socio-Economic
Experience
Planning



**Farm Machinery**
Autonomous Tracker
Weeding
Spraying
Fertilizing

**Agro-Climatic Networks**
Rainfall
Air Temperature
Solar Radiation
Spectroradiometer
Soil Moisture
Greenhouse Gas







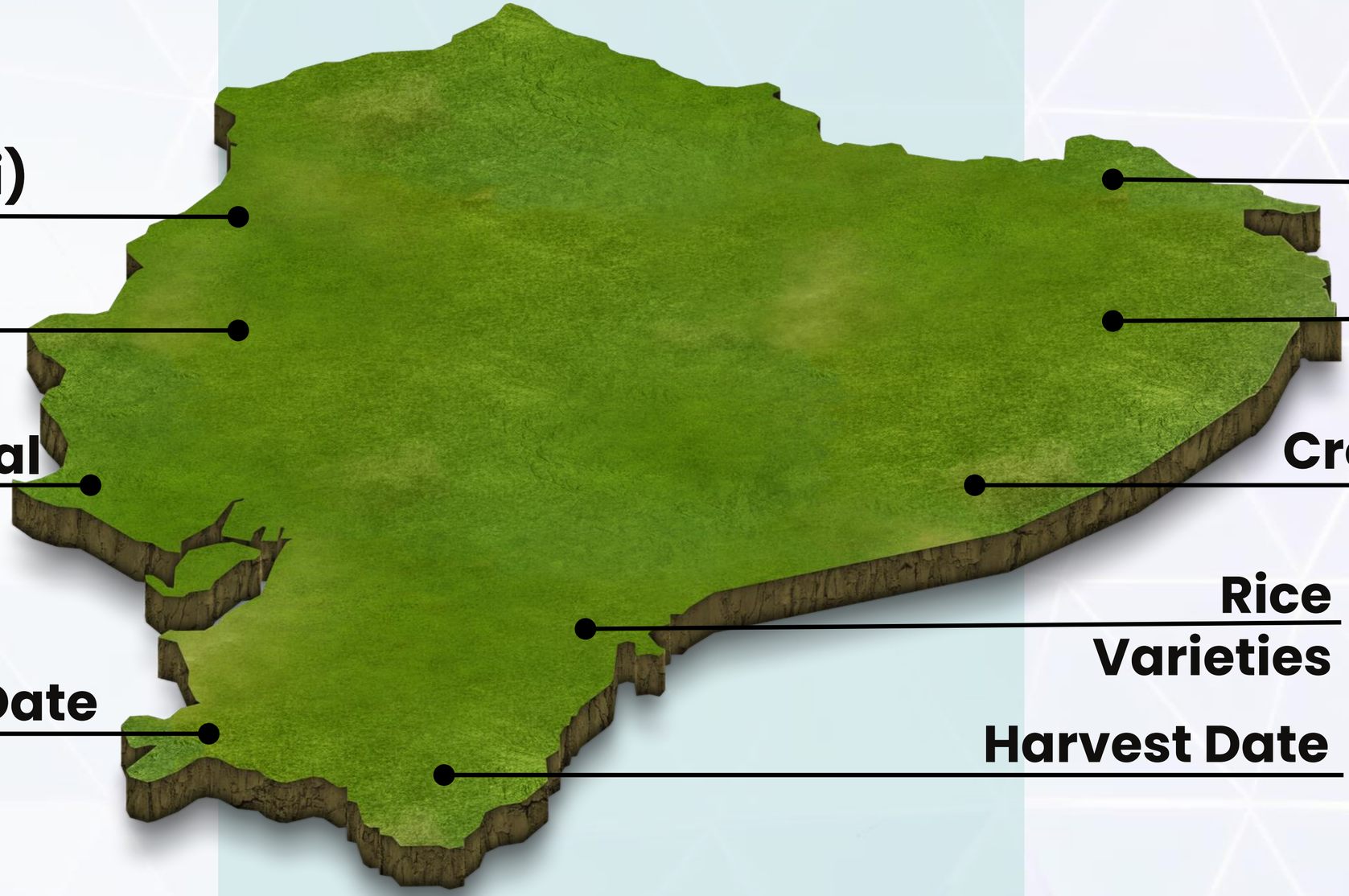





# Start Journey

## Draw Polygon

# Parcel Information



Area (Rai)

Location

Geographical Location

Seeding Date

Name

Crop Season

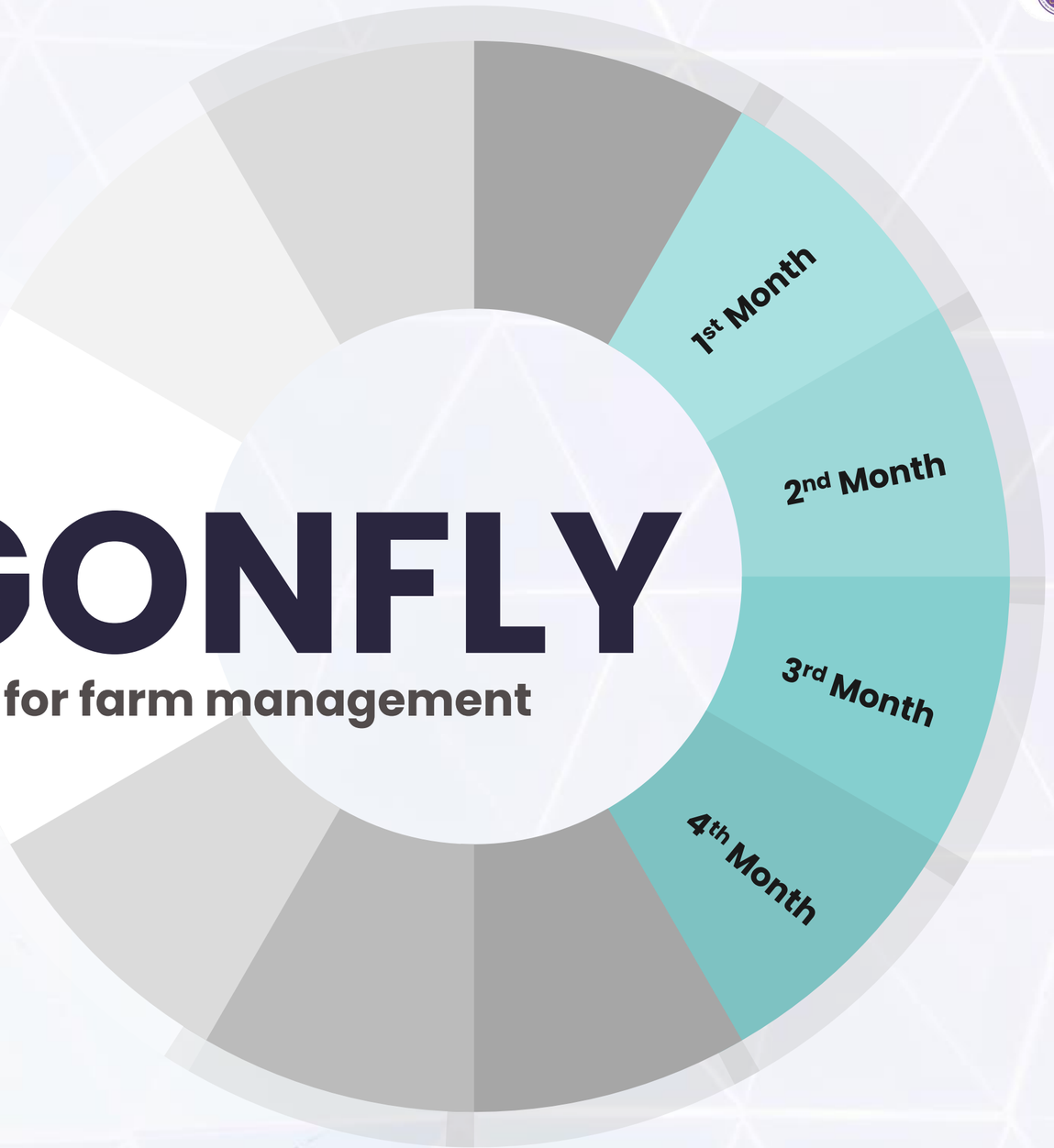
Crop Type

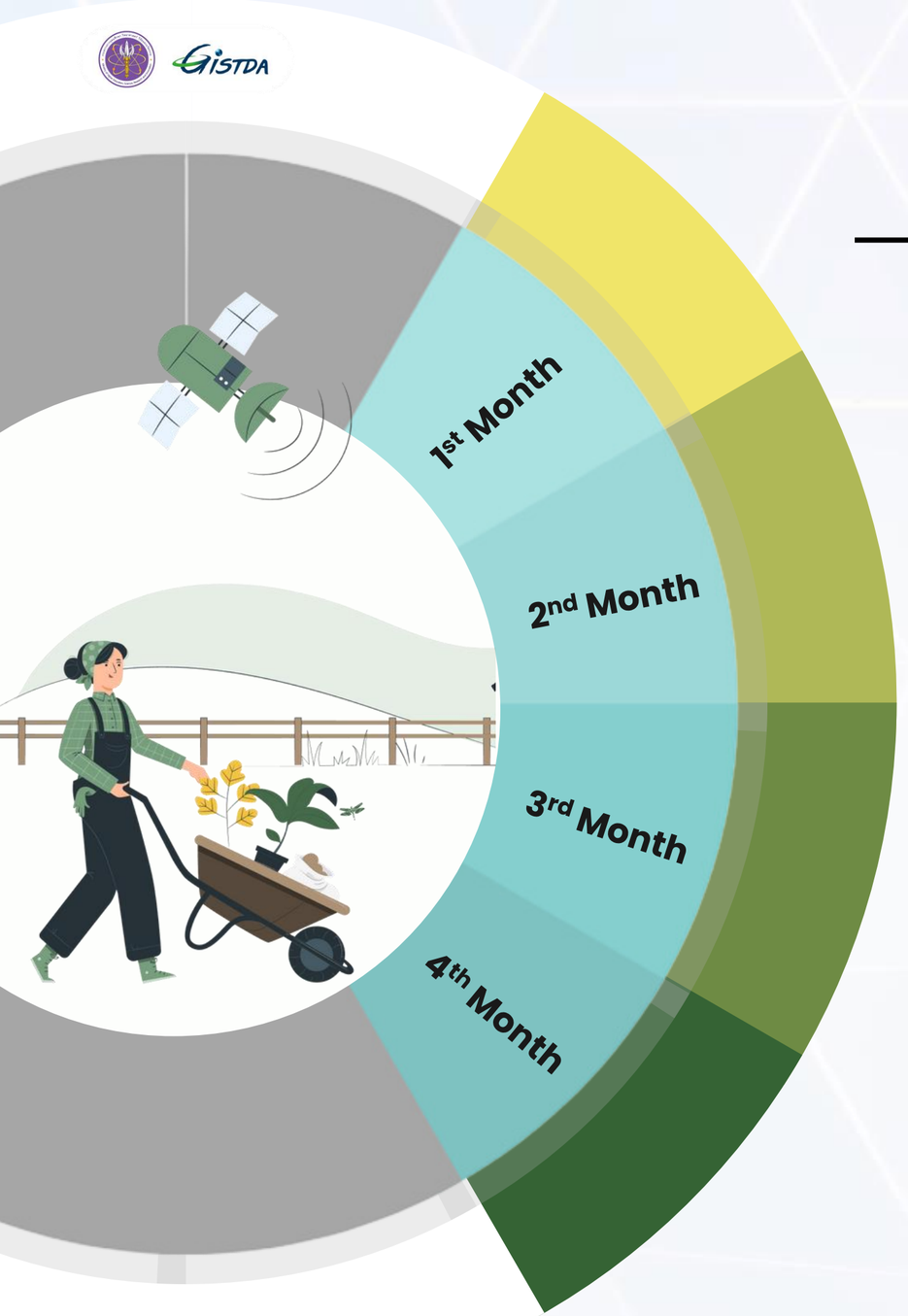
Rice Varieties

Harvest Date

# DRAGONFLY

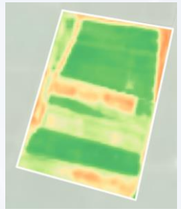
Satellite-based insight for farm management

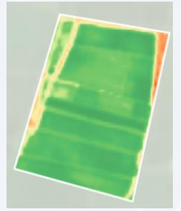


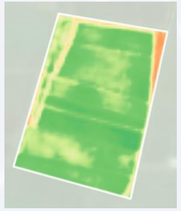


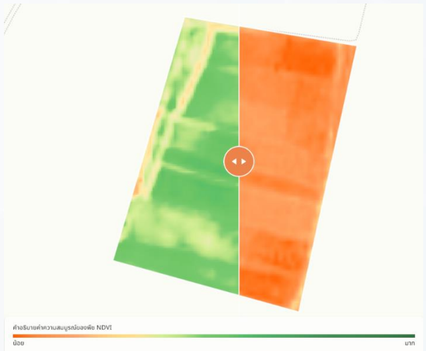

# Growth Monitoring

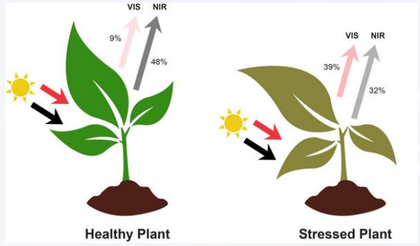

Feb 5, 2023


Feb 10, 2023


Feb 15, 2023


Feb 20, 2023



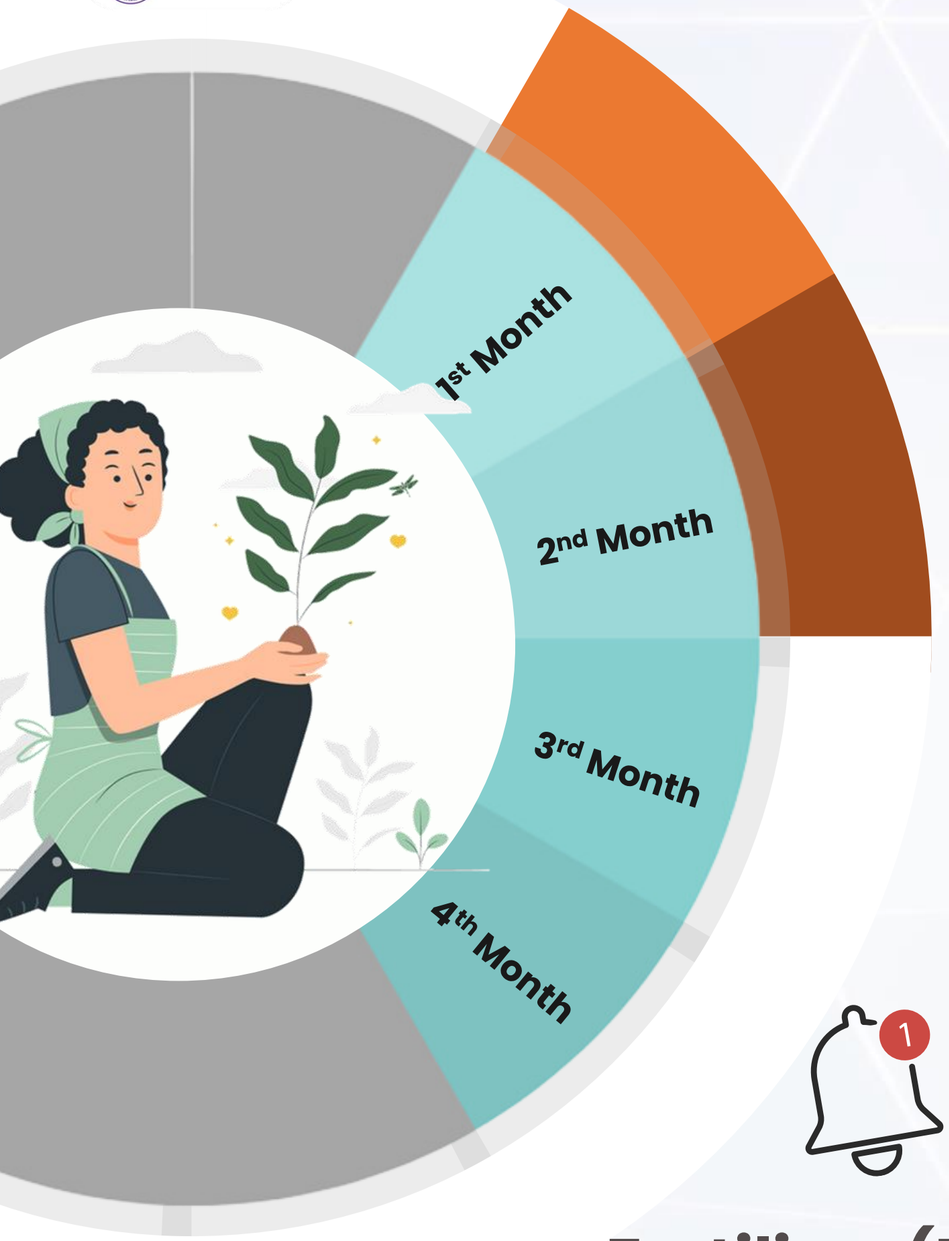


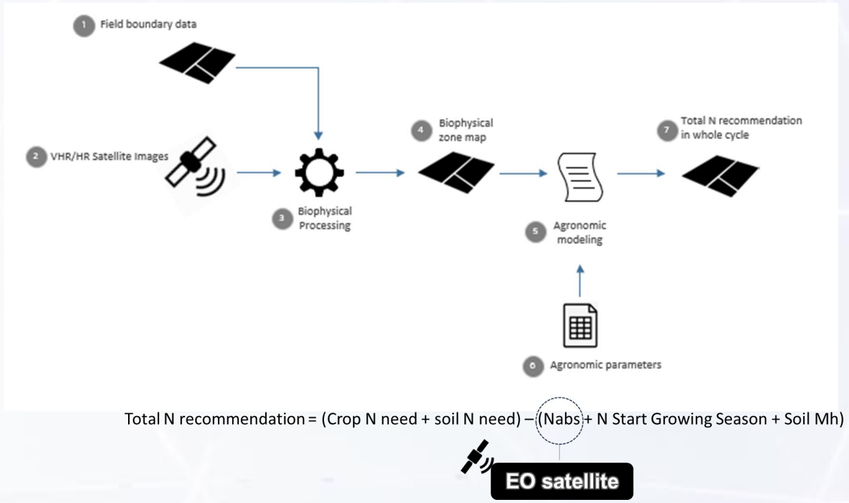

$$\frac{50 - 8}{50 + 8} = 0.72$$

$$\frac{40 - 30}{40 + 30} = 0.14$$

**Provide data every 5 days (NDVI)**

# Nitrogen Requirement




Total N recommendation = (Crop N need + soil N need) – (Nabs + N Start Growing Season + Soil Mh)

EO satellite

** This flowchart methodology is modified based on the AIRBUS-FARMSTAR product service

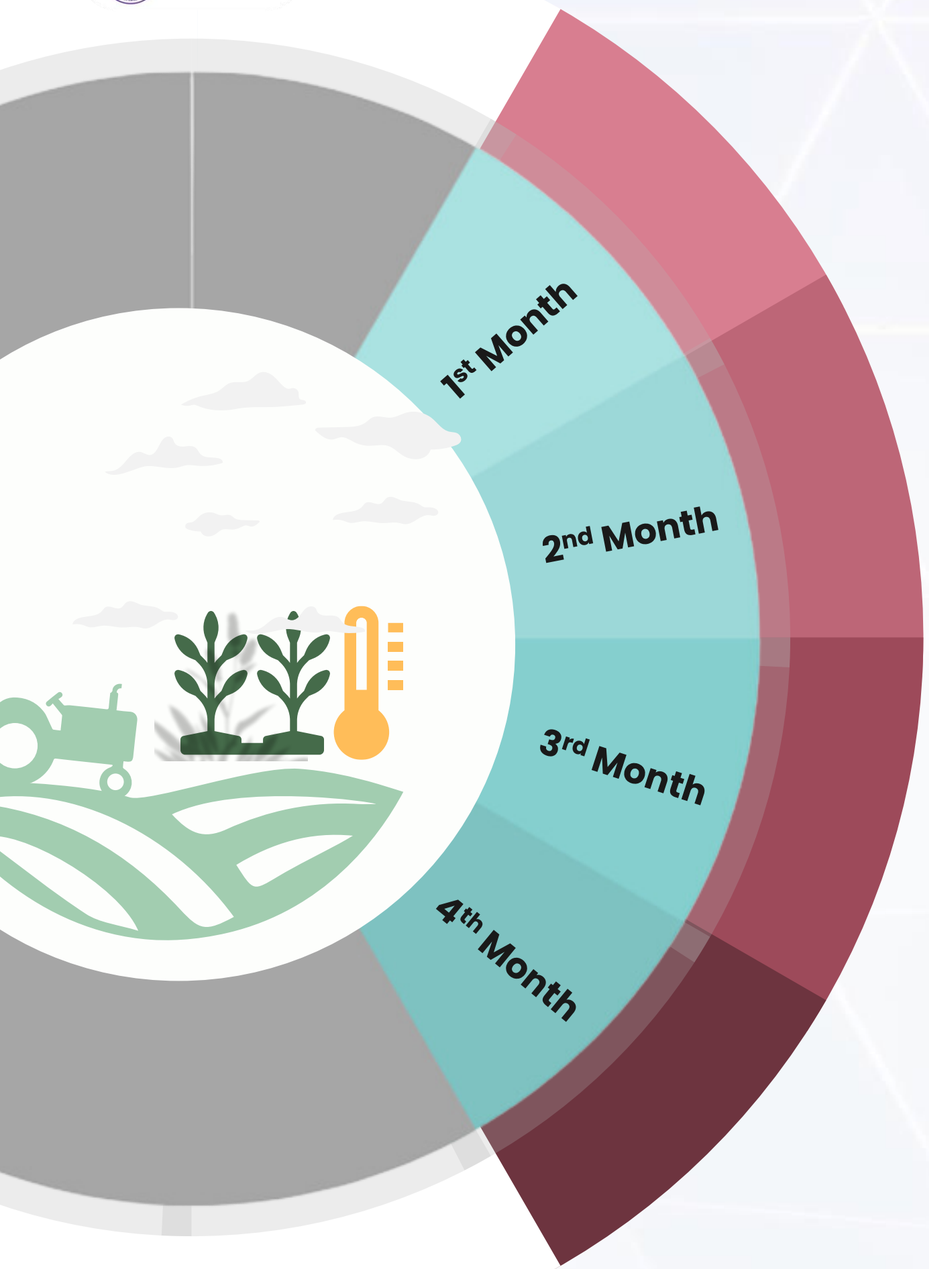


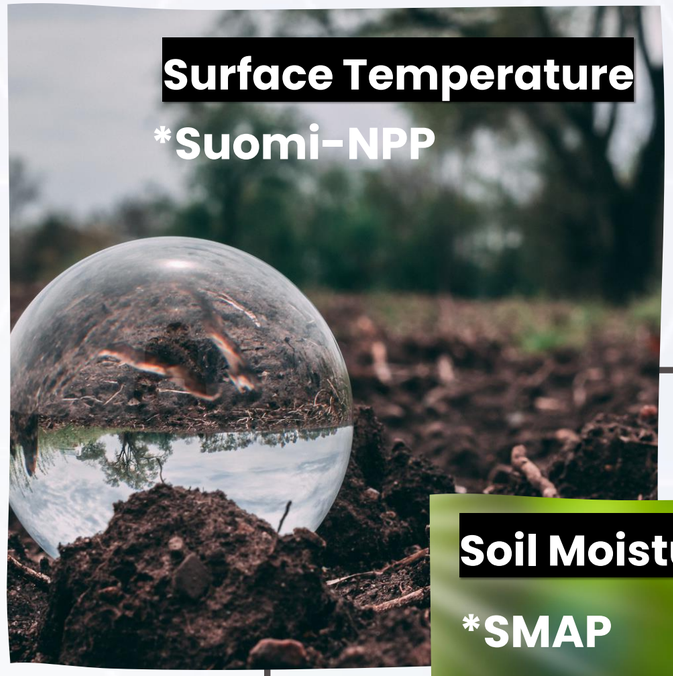
**Notify ahead of time**


***Available for paddy fields only**

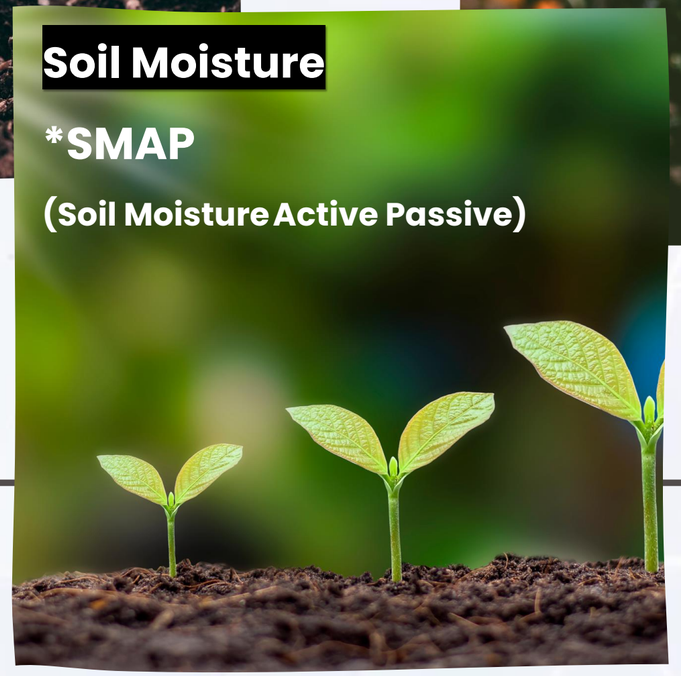
## Fertilizer (Nitrogen) Prescription Map

# Plot conditions

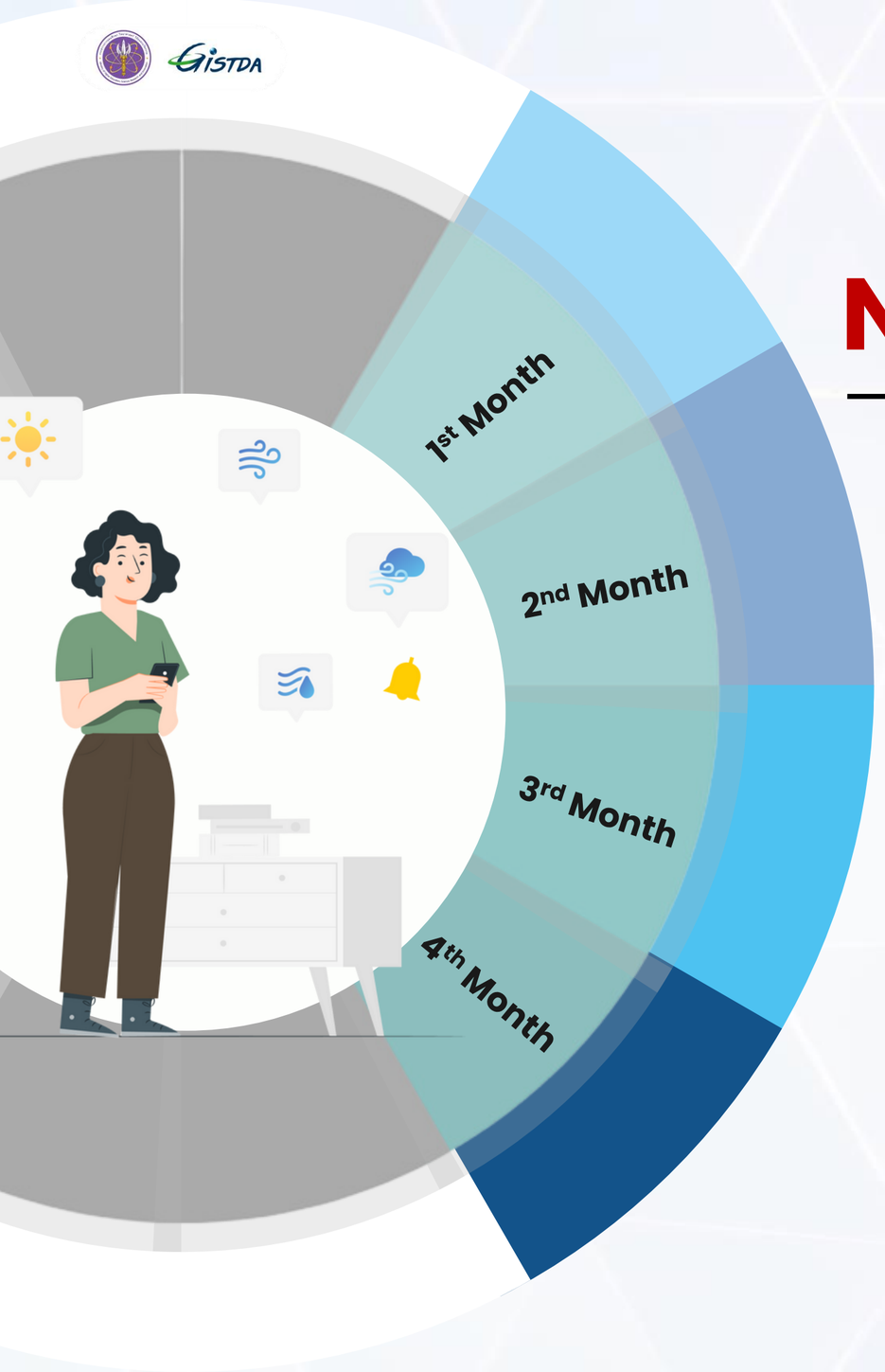






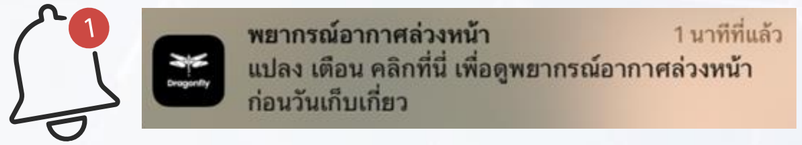

*Under improving (resolution) process




# Notify

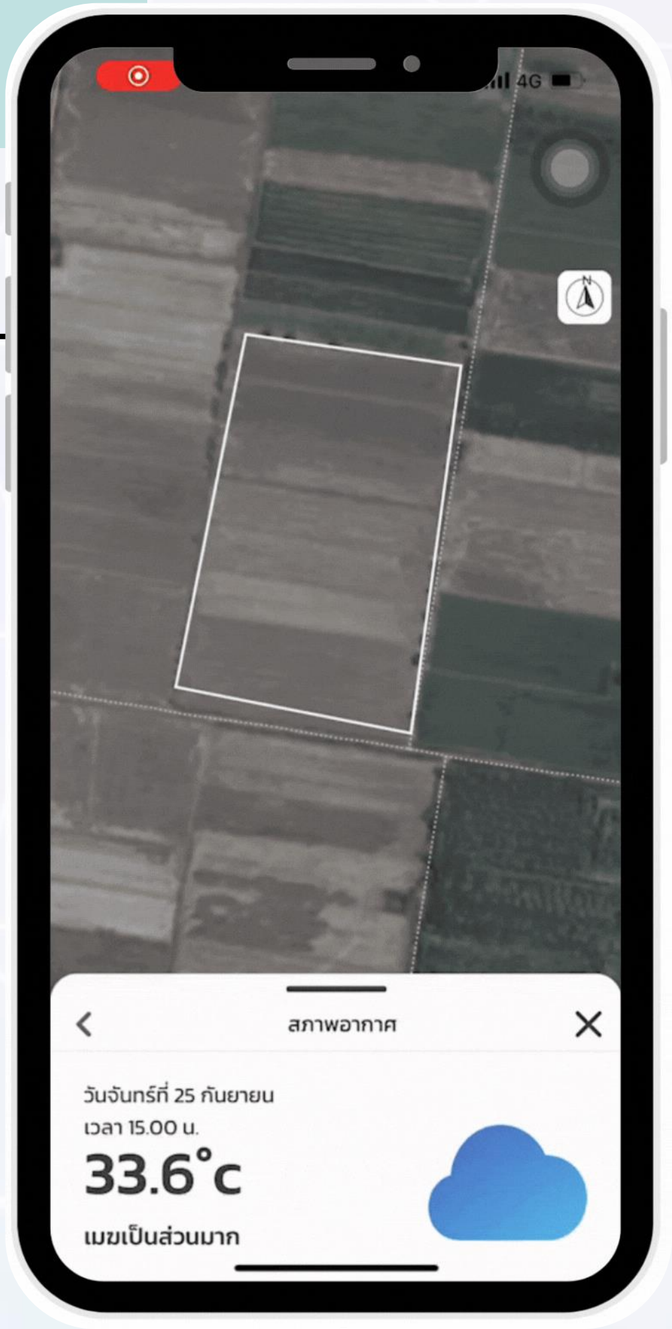
# Weather Conditions

## Hourly and 7 days forecast




## Seeding, Fertilizing, and Harvesting

*Meteorological Department



# Disaster

flood, drought, fire

### Flooding
**No**

Flooding nearby (5 km.)

**No**

### Hotspot
**No**

Hotspot nearby (5 km.)

**Yes**

### Drought
**Yes**

Drought nearby (5 km.)

**Yes**

Extracted from Satellite images

## Product Price

## Note book

# Product Price

Disaster

Production's Market Price

Origin: Ministry of Commerce (https://data.moc.go.th)

**5% non-glutinious paddy (off season)** (บาท/ตัน)

↓ Lowest price: 10,500 บาท/ตัน

↑ Highest price: 10,700 Bath/ton

Data at 30 September 2024

**5% non-glutinious paddy (in-season)** (บาท/ตัน)

↓ Lowest price: 12,900 บาท/ตัน

↑ Highest price: 13,100 Bath/ton

Data at 29 February 2024

Note book

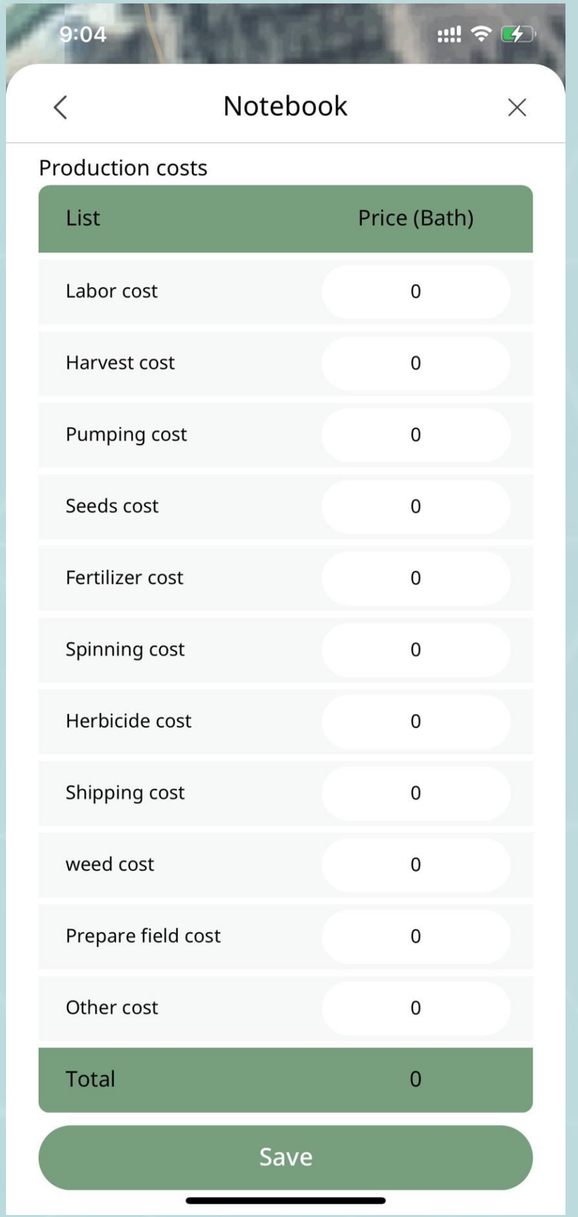
# Notebook

Record data on production results and expenses using a personal digital notebook.

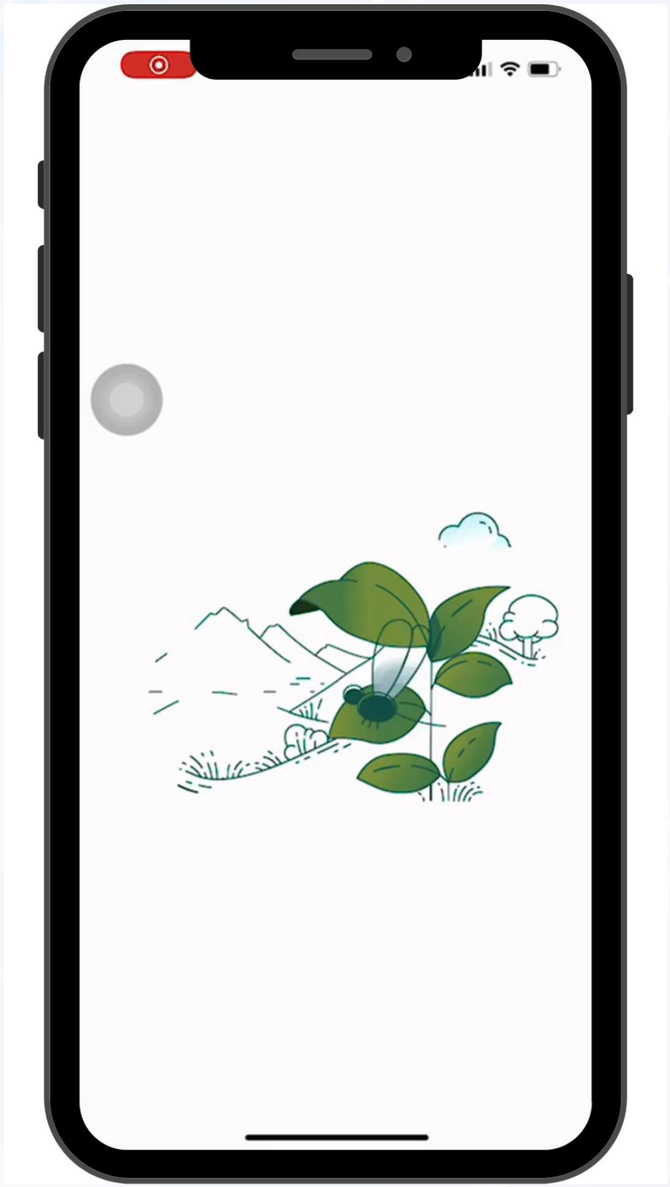
Disaster

Product

Price



# Further Development



- Pest & Disease Alert
- Credit Score
- Yield Prediction
- Carbon Credit
- Straw Calculator
- Crop Water Requirement
- Crop Insurance
- Market Place

Dragonfly

# Dragonfly


sirikul@gistda.or.th

Geo-informatics and Space Development Agency

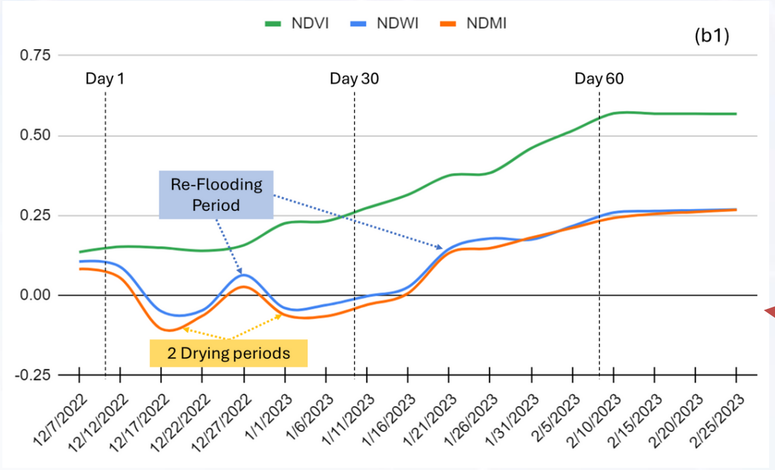
Ministry of Higher Education, Science, Research and Innovation

THAILAND

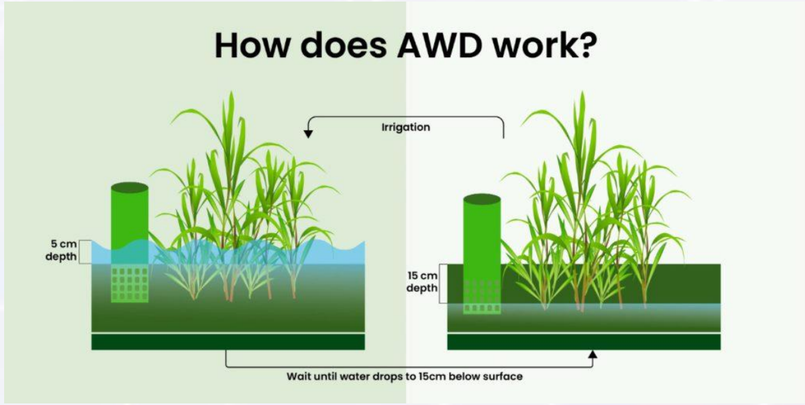
# In-House POC

# Evaluating AWD method in Paddy fields

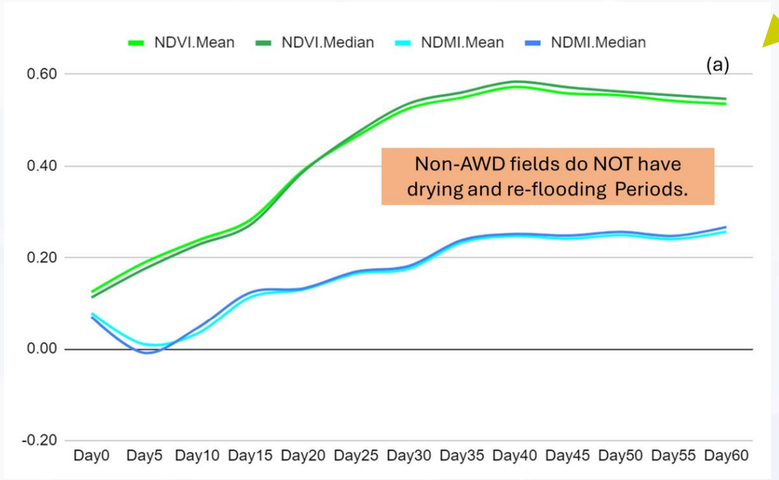
## NDVI and NDMI of AWD paddy field

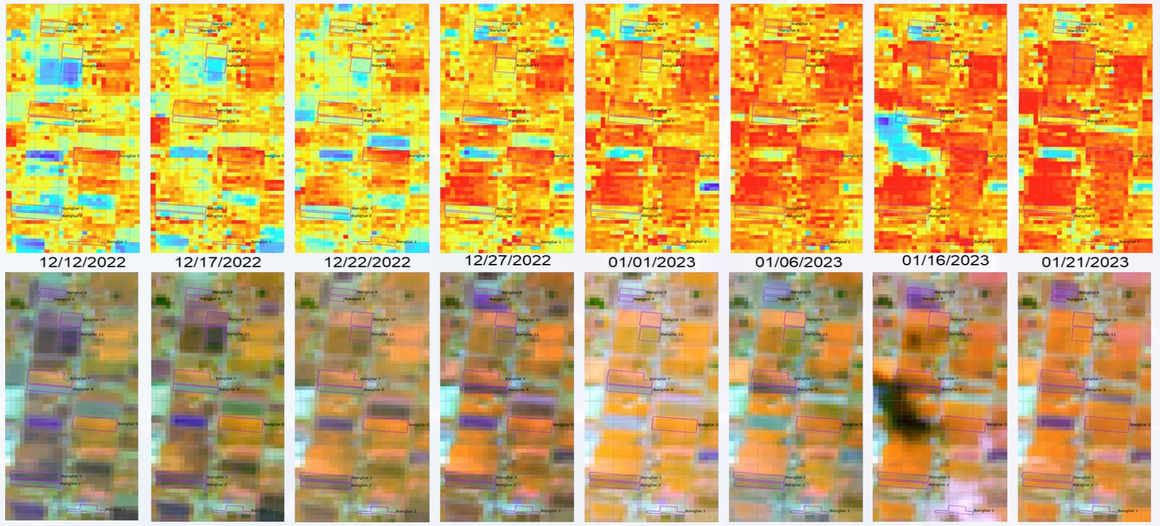







## NDVI and NDMI of non-AWD Paddy fields



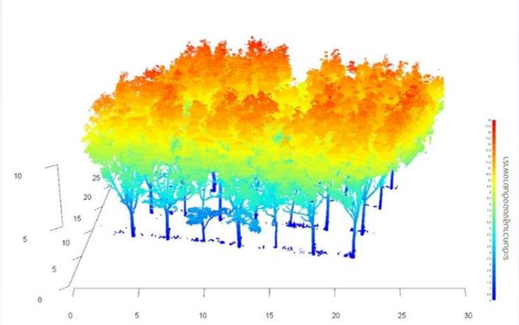




## Carbon Credit

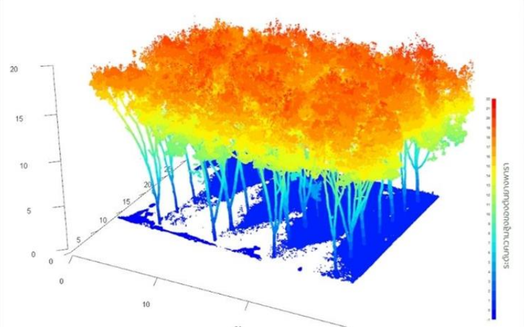
# In-House POC

# Estimate Carbon Stock in Para Rubber fields

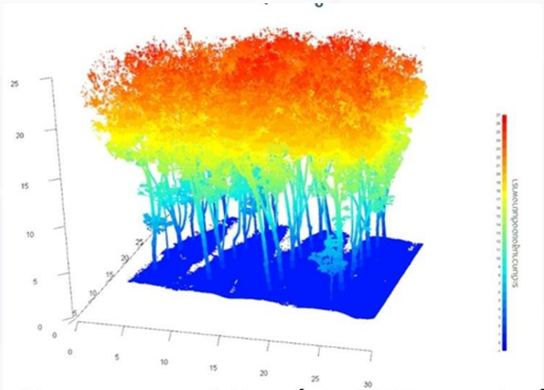
**Carbon Credit**



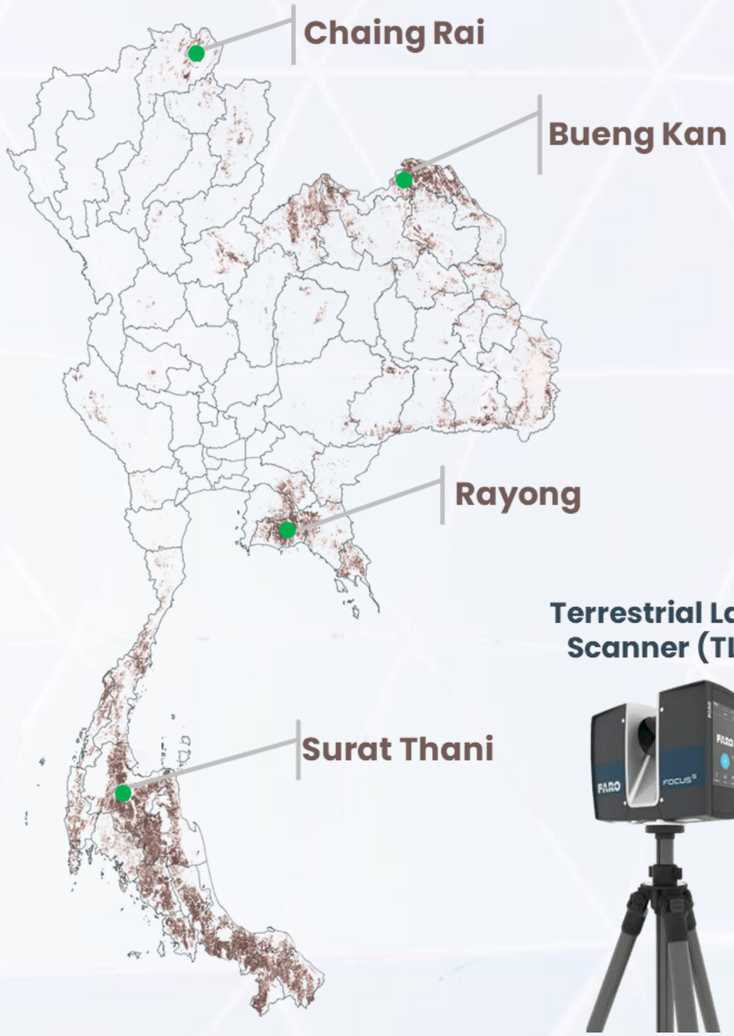
Rubber tree at age of 8 yrs (avg. 7.95 Ton Carbon)



Rubber tree at age of 14 yrs (avg. 14.39 Ton Carbon)



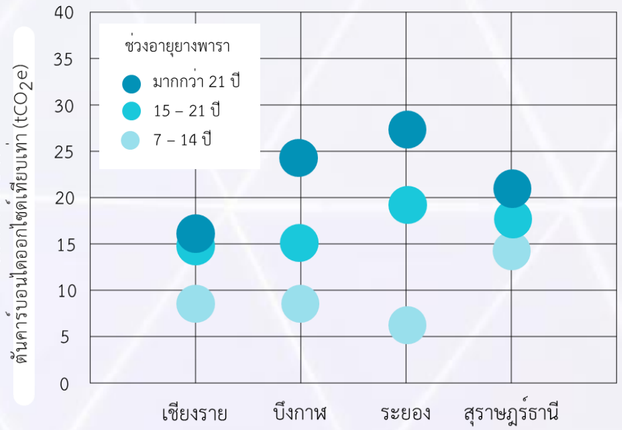
Rubber tree at age of 32 yrs (avg. 22.25 Ton Carbon)



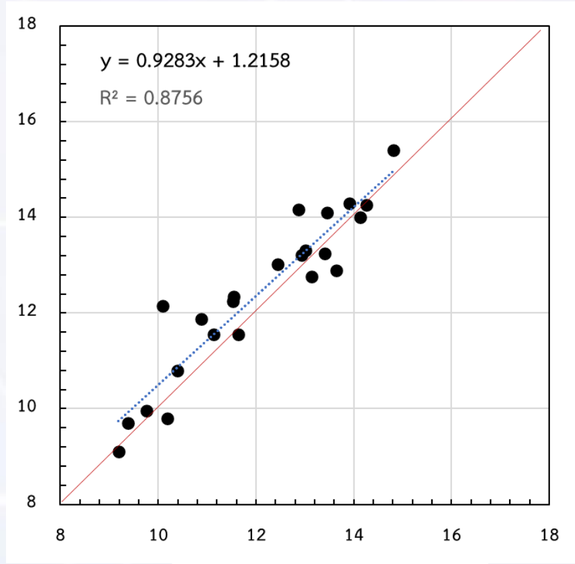

**Terrestrial Laser Scanner (TLS)**




เปรียบเทียบปริมาณการกักเก็บคาร์บอนเฉลี่ยตามอายุในสวนยางพารา



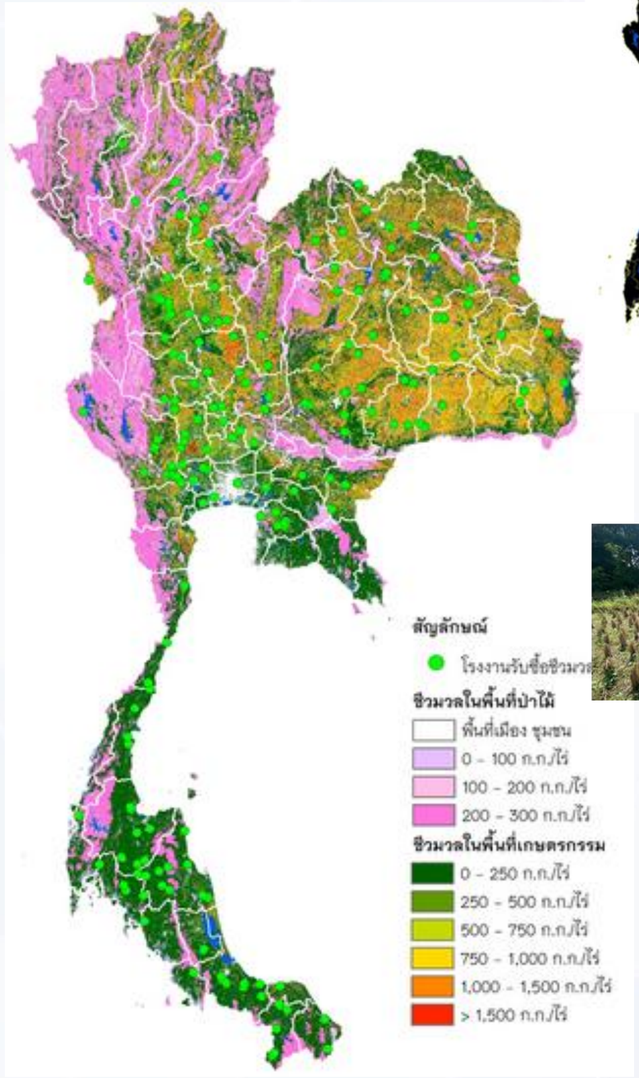

หมายเหตุ: ปริมาณการกักเก็บคาร์บอนและปริมาณมวลชีวภาพ เป็นการประมวลผลเบื้องต้นจากข้อมูลไลดาร์
ทั้งนี้จำเป็นต้องใช้ข้อมูลด้านอื่นๆ ประกอบการวิเคราะห์เพิ่มเติม

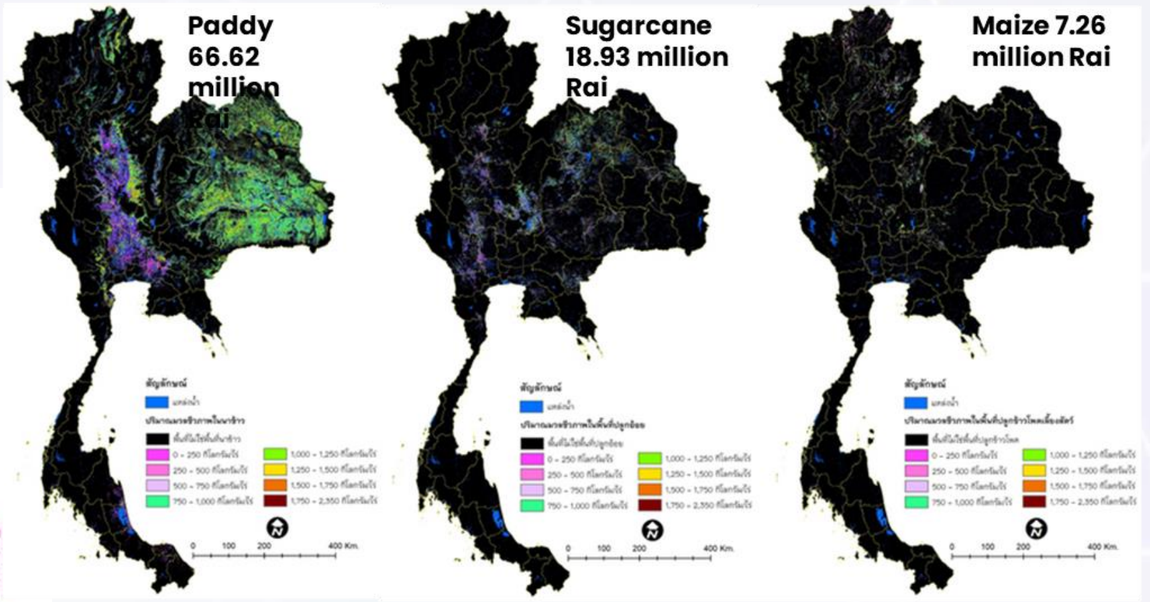


# In-House POC

## Carbon Credit

## Biomass and Agriculture Residuals (unit: Million Ton)

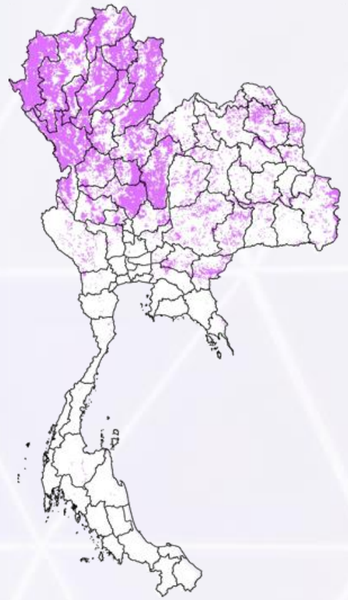


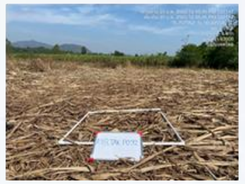

**paddy**
56.9 /11.4

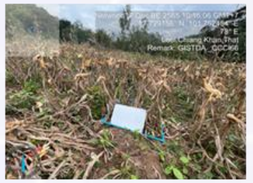
**sugarcane**
15.9 /3.18

**maize**
5.6 /1.11

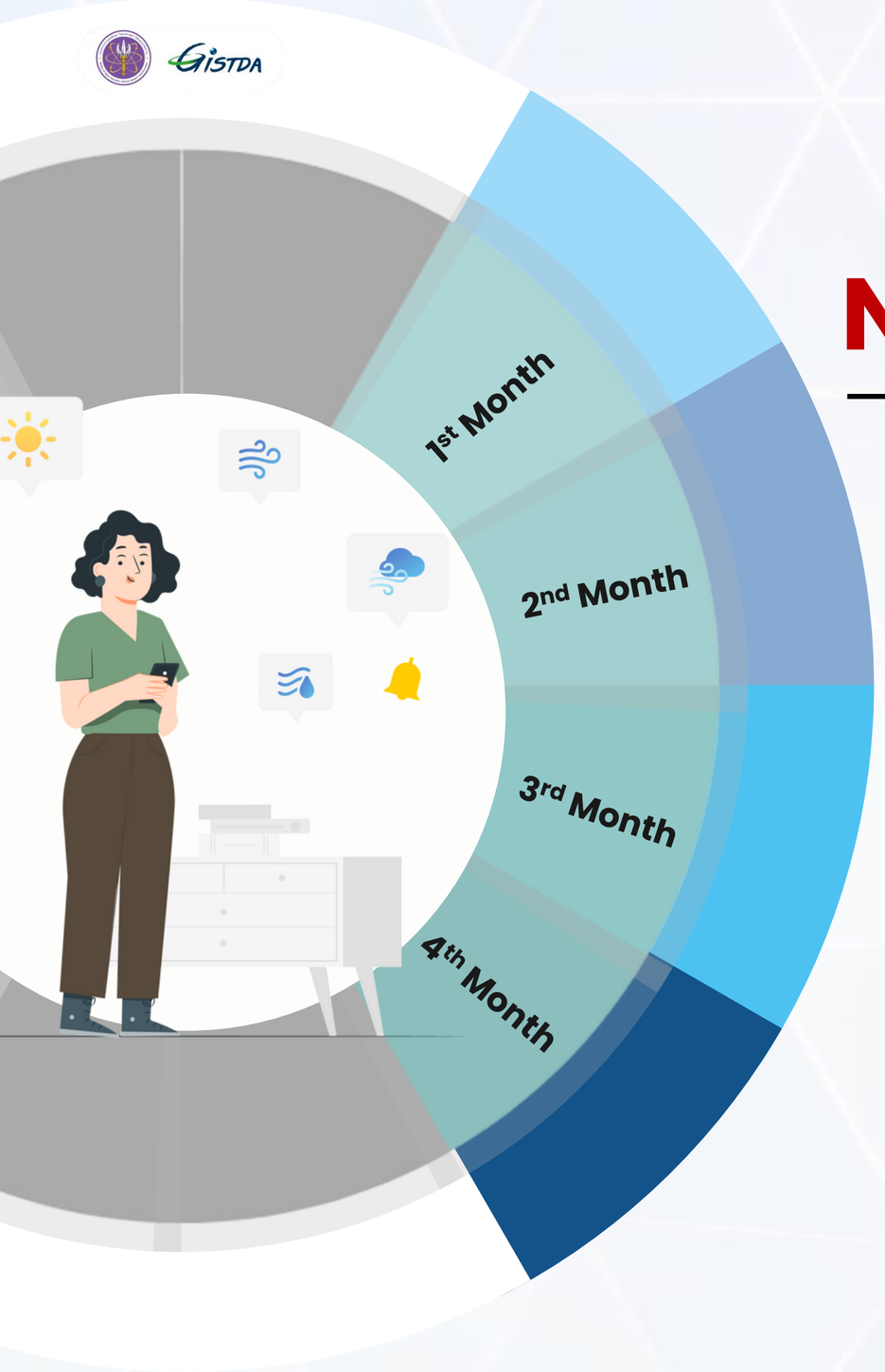


**Burnt Areas**

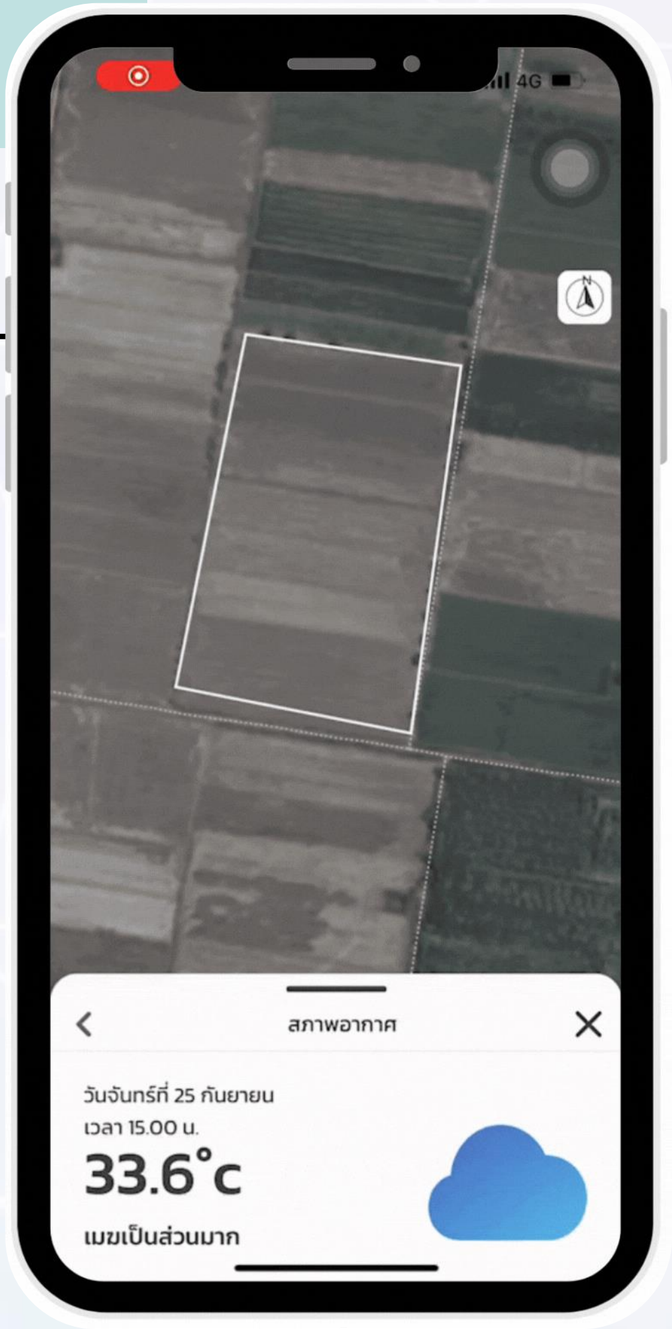

# Estimate Carbon Emission
## from burning in agricultural residuals




# Notify

# Weather Conditions

**Hourly and 7 days forecast**




*Meteorological Department

# Web

## Application

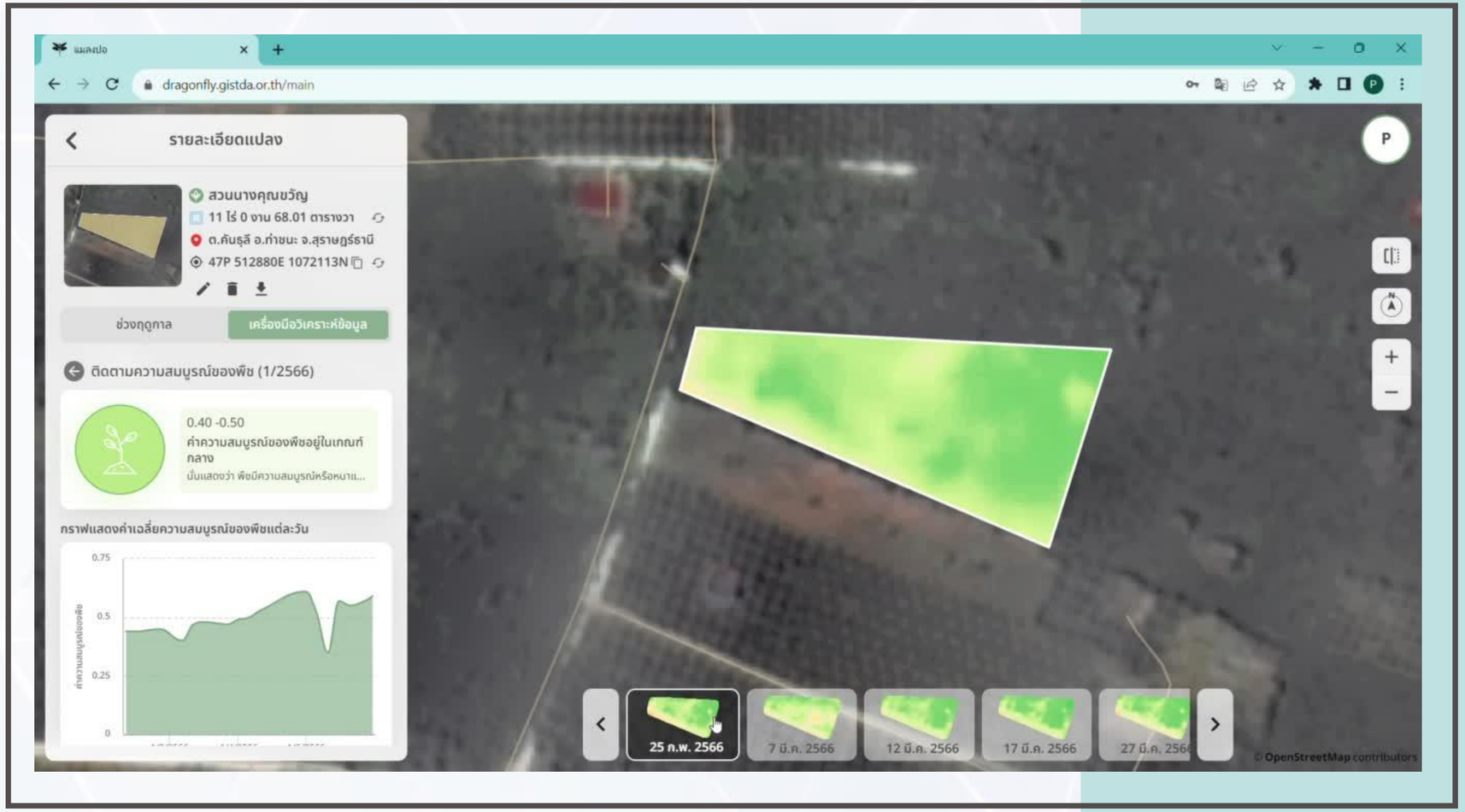

# Mobile

## Application


iOS

# Growth Monitoring

**Para Rubber**




https://dragonfly.gistda.or.th/main