

# Sustainable Agricultural Machinery in Thailand

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*Presentation by*

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CSAM




# General Information on Agriculture and Mechanization

- Thailand is a newly industrialized country.
- Its economy is heavily export-dependent
- Exports accounting for more than two thirds of its GDP.
- In 2012, Thailand had a GDP of THB11.375 trillion (US\$366 billion).
- Per-capita GDP was \$5,390.
- Thailand's agricultural sector produces 8.4 percent of the GDP.
- The Thai economy grew by 6.5 percent, inflation rate of 3.02 %
- In 2013, GDP 2.7 %
- In 2014, GDP 2.9 %

## Major crops:

Rice, maize, sugarcane, soybean, cassava, rubber, horticulture crops, oil palm

Crops	Planting area mil. ha	Production mil. tons
Rice	9.5	20
Maize	1.2	4.1
Cassava	1	18



Thailand has developed its own range of agricultural machinery and agricultural equipment to suit the special needs and pockets of its mainly agrarian population.

Rice production is the foremost user of this equipment. Planting machinery, Rice threshers, tractors and walking ploughs and nowadays machines that help with the cultivation, caring and harvesting.

# Farm Machinery Range of THAILAND

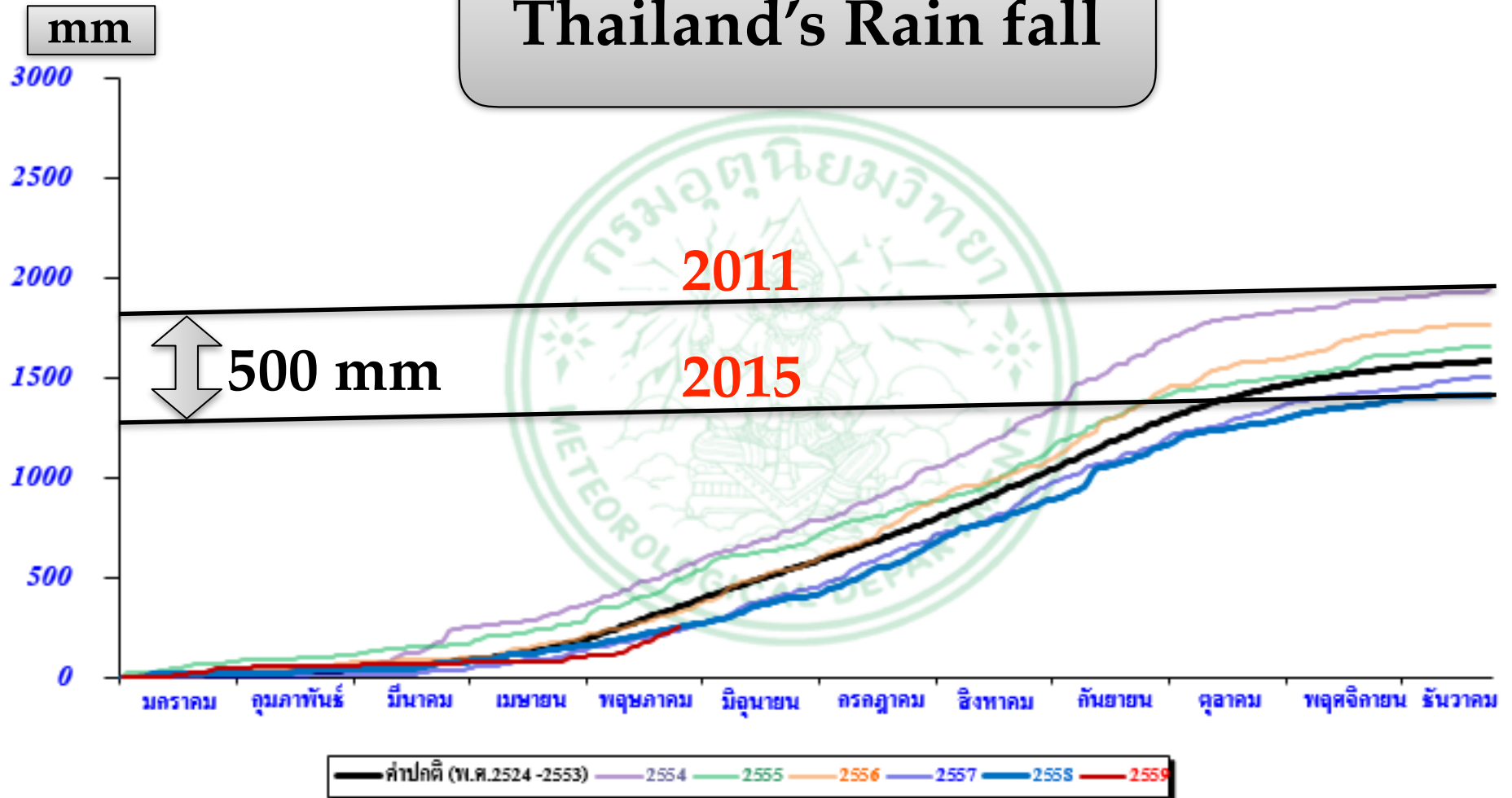


# Farm Machinery Range of THAILAND



# CLIMATE CHANGE effect to AGRICULTURE

## Thailand's Rain fall



# Modern Technology for Sustainable Agricultural Systems

- The world population is projected to reach 9 billion by 2050.
- Therefore, managing agricultural production systems on a sustainable basis is one of the most critical challenges for the future of humanity.
- Technological advancements must be used to provide farmers with tools and resources to make farming more sustainable.
- Concepts of modern technologies in agricultural systems have given an important role for the improvement of agricultural productions e.g. crop yield, livestock production, aquaculture production, and sustainable agriculture, in order to maintain food security.

# Thailand Efforts in Extension of Farm Mechanization



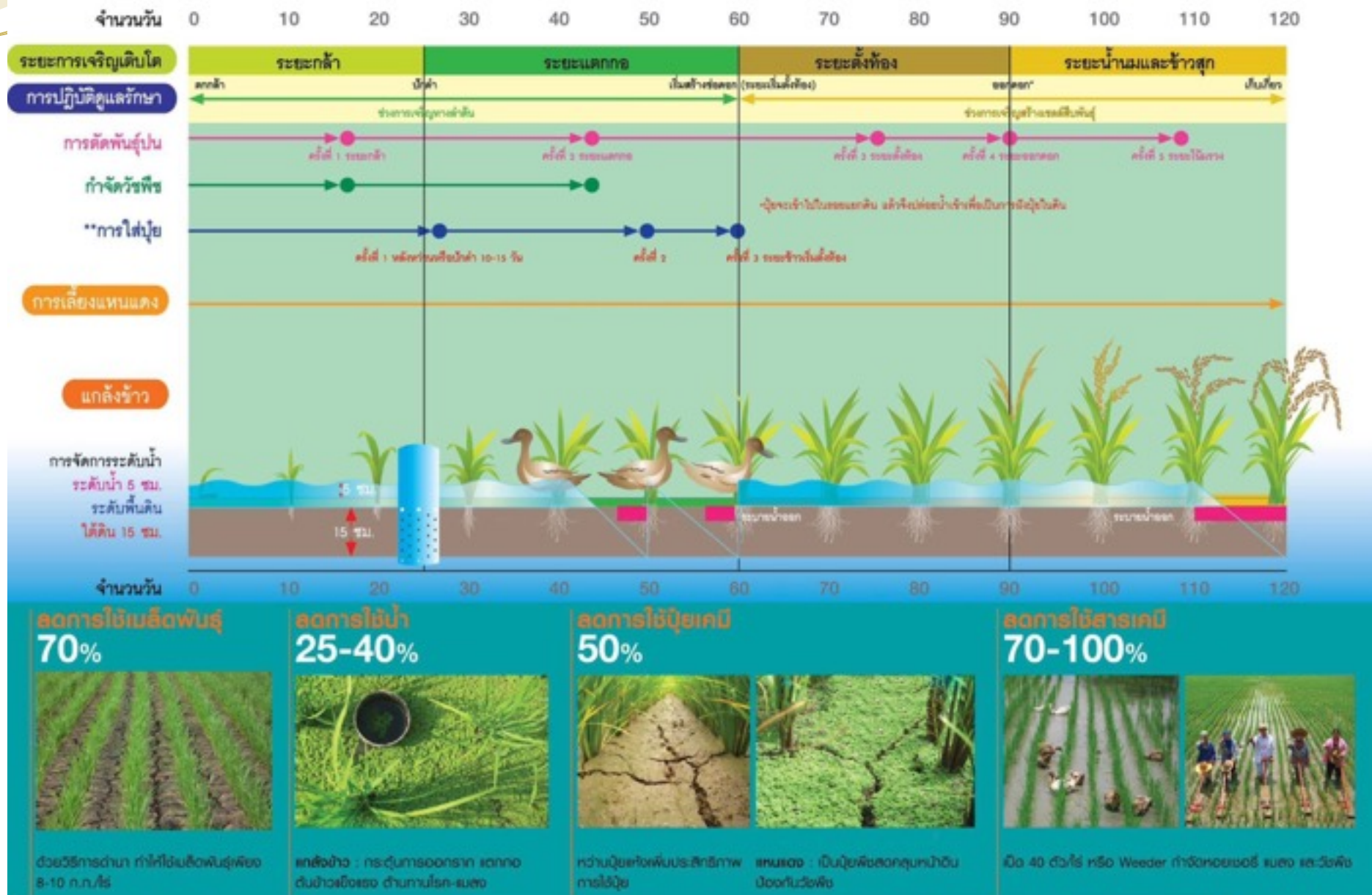
## Burning Problem



# Thailand Efforts in Extension of Farm Mechanization



Farm Machinery Demonstration plot of Non-burning Field



# Thailand Efforts in Extension of Farm Mechanization



Farm Machinery Demonstration plot of Soil Preparation

# Thailand Efforts in Extension of Farm Mechanization

## Sub-Soiling Extension

### การไถระเบิดดินดาน



รอยแยกของดินหลังการไถระเบิดดินดาน  
ทำให้น้ำซึมผ่านลงไปเก็บไว้ในดินได้ดี



เปรียบเทียบความหนาของหน้าดิน  
ก่อนและหลังไถระเบิดดินดาน



เตรียมดินลึก รากโตเต็มที่ พืชโตเต็มที่  
ผลผลิตดี ทนแล้ง น้ำไม่ท่วมขัง

## Farm Machinery Demonstration plot of Soil Preparation

# Thailand Efforts in Extension of Farm Mechanization



# Farm Machinery Service Center (LAND PREPARATION)

## PRINCIPLE

- ▶ to develop soil preparation quality for plantation by setup qualitative farm machinery service center including; subsoiler, ploughing and harrowing for field crops solving hardpan problem
- ▶ farm machinery service center operates and manages by a group of members

# Farm Machinery Service Center:

## ADVANTAGE

- ▶ to reduce investment cost of small scale farmers
- ▶ to make more opportunity for small scale farmers to use the high capacity machines
- ▶ to develop new generation farmer as professional farmer
- ▶ to efficiently use machineries by full time using

## GOOD PLOUGHING



# Farm Machinery Service Center:

## Management Methodology

- ▶ Separate incomes into 2 parts
  - ▶ Part 1: Not less than 30% of income to keep it for buy new machines or changing old machines
  - ▶ Part 2: Not over 70% of income use to be all of the operation and maintenance costs

# Thailand Efforts in Extension of Farm Mechanization



Soil Erosion Problem

# Thailand Efforts in Extension of Farm Mechanization



Soil Erosion Problems

# Thailand Efforts in Extension of Farm Mechanization



The 4th Regional Forum on Sustainable Agricultural Mechanization in Asia and the Pacific

# Thailand Efforts in Extension of Farm Mechanization



Planting along contouring lines against Soil Erosion

# Thailand Efforts in Extension of Farm Mechanization



Planting along contouring lines against Soil Erosion

# Thailand Efforts in Extension of Farm Mechanization



Planting along contouring lines against Soil Erosion

# Thailand Efforts in Extension of Farm Mechanization



Training Course in Irrigation System

# Thailand Efforts in Extension of Farm Mechanization



Training Course in Irrigation System

# Thailand Efforts in Extension of Farm Mechanization

*On the crisis of flooding in 2011:*  
the program on repaired and maintenance for agricultural engines damaged by flood



# Thailand Efforts in Extension of Farm Mechanization

Mechanics  
development  
in rural area

## ช่างเกษตรท้องถิ่นคือใคร?

คือ **ผู้ให้บริการซ่อม** เครื่องยนต์เกษตรภายในชุมชน

คือ **ผู้แนะนำการใช้ และบำรุงรักษา** เครื่องยนต์เกษตร อย่างถูกวิธี เพื่อยืดอายุการใช้งานของ เครื่องยนต์เกษตร ให้แก่เกษตรกรใน ชุมชน

คือ **ผู้เป็นสื่อกลาง** ถ่ายทอดเทคโนโลยี ด้านเครื่องจักรกล การเกษตร ระหว่าง กรมส่งเสริมการเกษตร เกษตรกร และผู้รับจ้าง ให้ บริการเครื่องจักรกล การเกษตร



**Roles**

กรมส่งเสริมการเกษตร

## การสร้างช่างเกษตรท้องถิ่น ของกรมส่งเสริมการเกษตร

**3** ระดับประกอบอาชีพ (เครื่องยนต์เกษตร 3)

สามารถที่จะวิเคราะห์ปัญหาข้อผิดพลาดของ เครื่องยนต์เกษตรได้จากระบบตลอดจนการปรับตั้ง เครื่องยนต์ได้อย่างมีประสิทธิภาพ

**2** ระดับซ่อมแซมเบื้องต้น (เครื่องยนต์เกษตร 2)

สามารถที่จะซ่อมแซมและเปลี่ยนชิ้นส่วนที่ชำรุดของเครื่องยนต์ เกษตรได้

**1** ระดับพื้นฐาน (เครื่องยนต์เกษตร 1)

สามารถที่จะแนะนำการใช้และบำรุงรักษาเครื่องยนต์ได้อย่างถูกวิธีให้แก่เกษตรกร ในพื้นที่



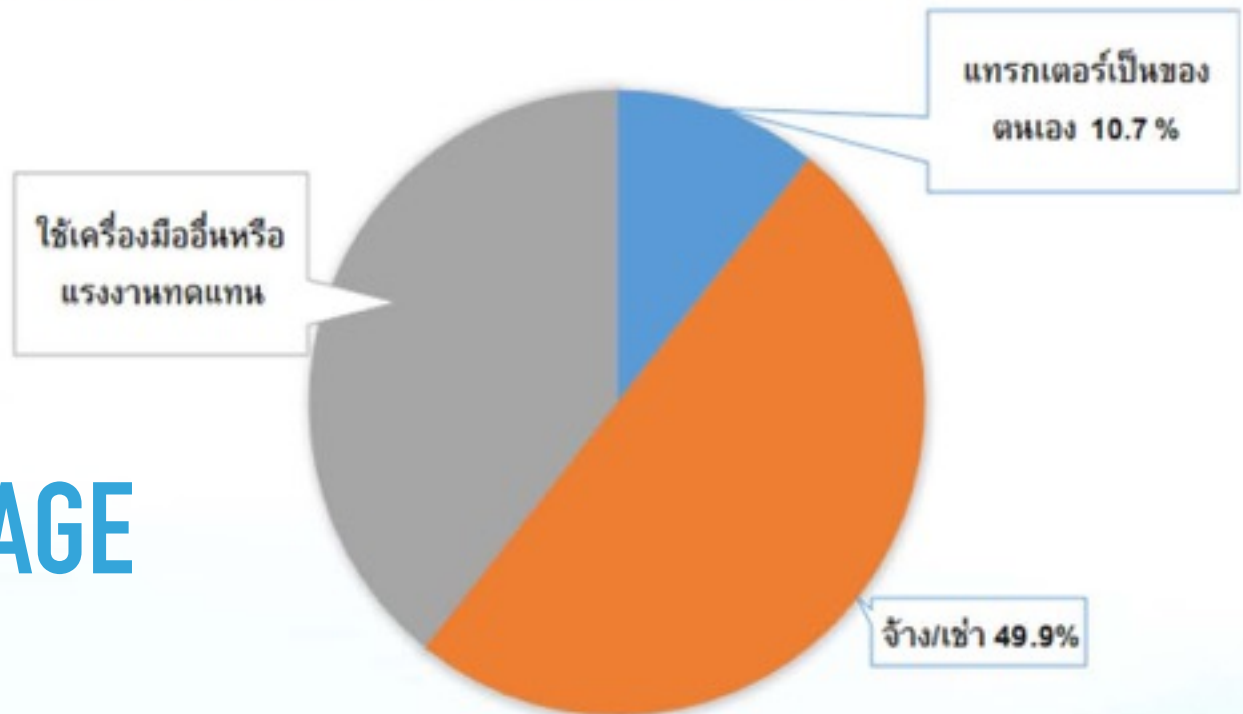
**Levels**

กรมส่งเสริมการเกษตร



# Farm Machinery Usage by Ratio

TRACTOR	HOUSEHOL	%
owned	607,340	10.7
contractor services	2,830,282	49.9
labor&others	2,226,095	39.2

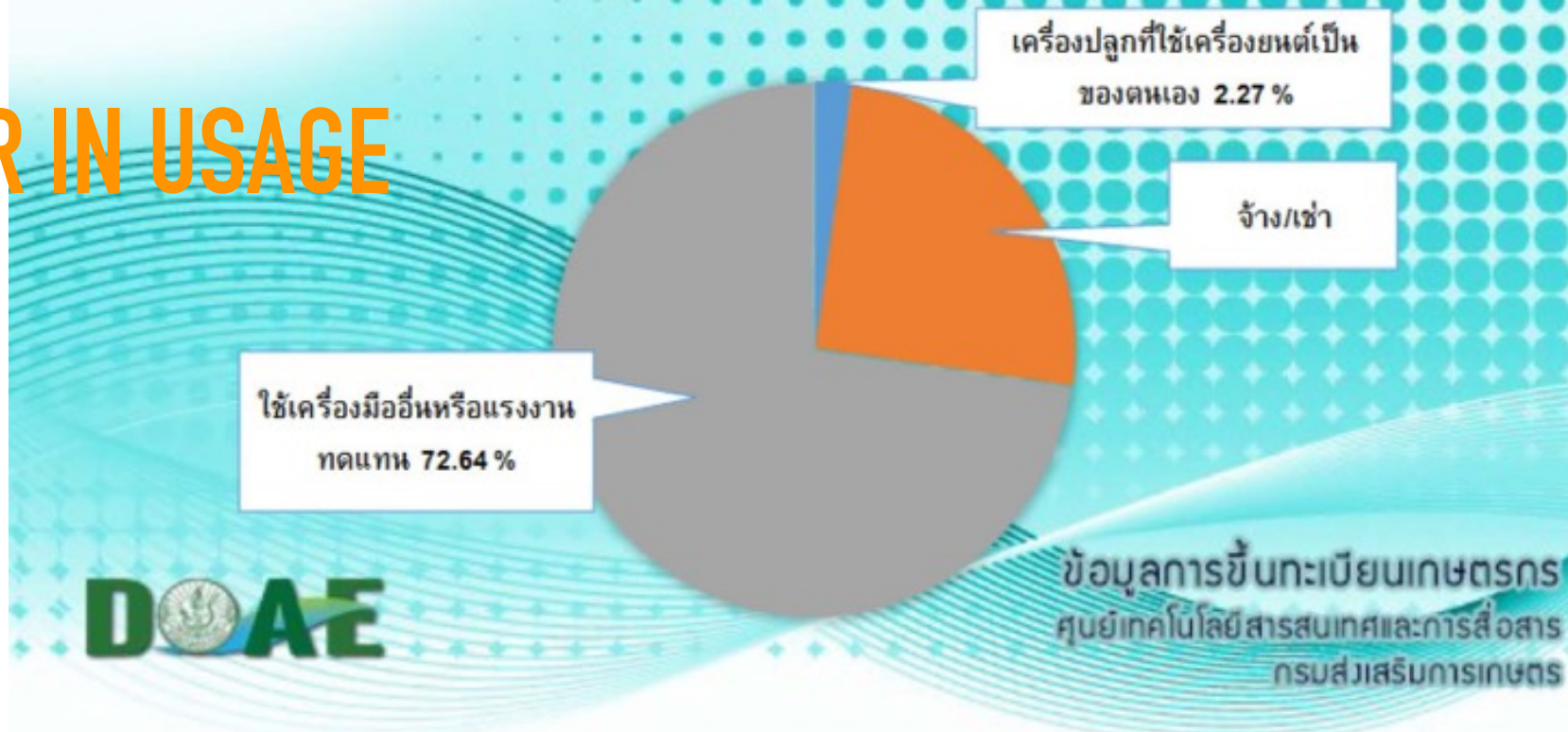


## TRACTOR IN USAGE

# Farm Machinery Usage by Ratio

PI ANTER	HOUSEHOLD	o/
owned	128,676	2.27
contractor services	1,413,034	24.91
labor&others	4,121,098	72.64

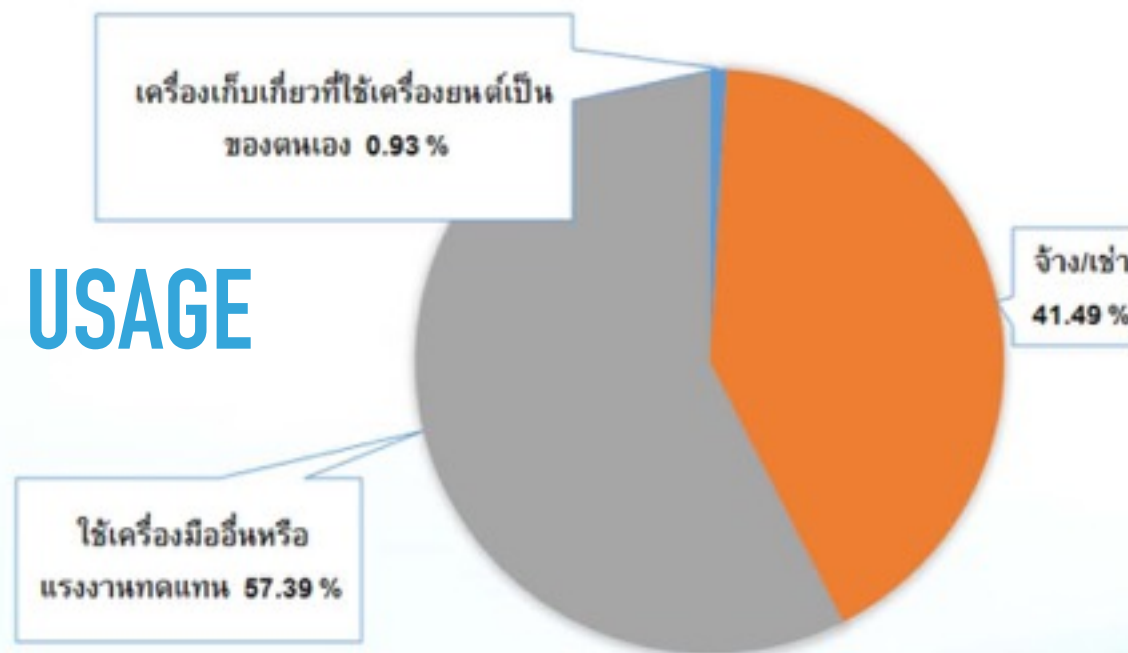
PLANTER IN USAGE



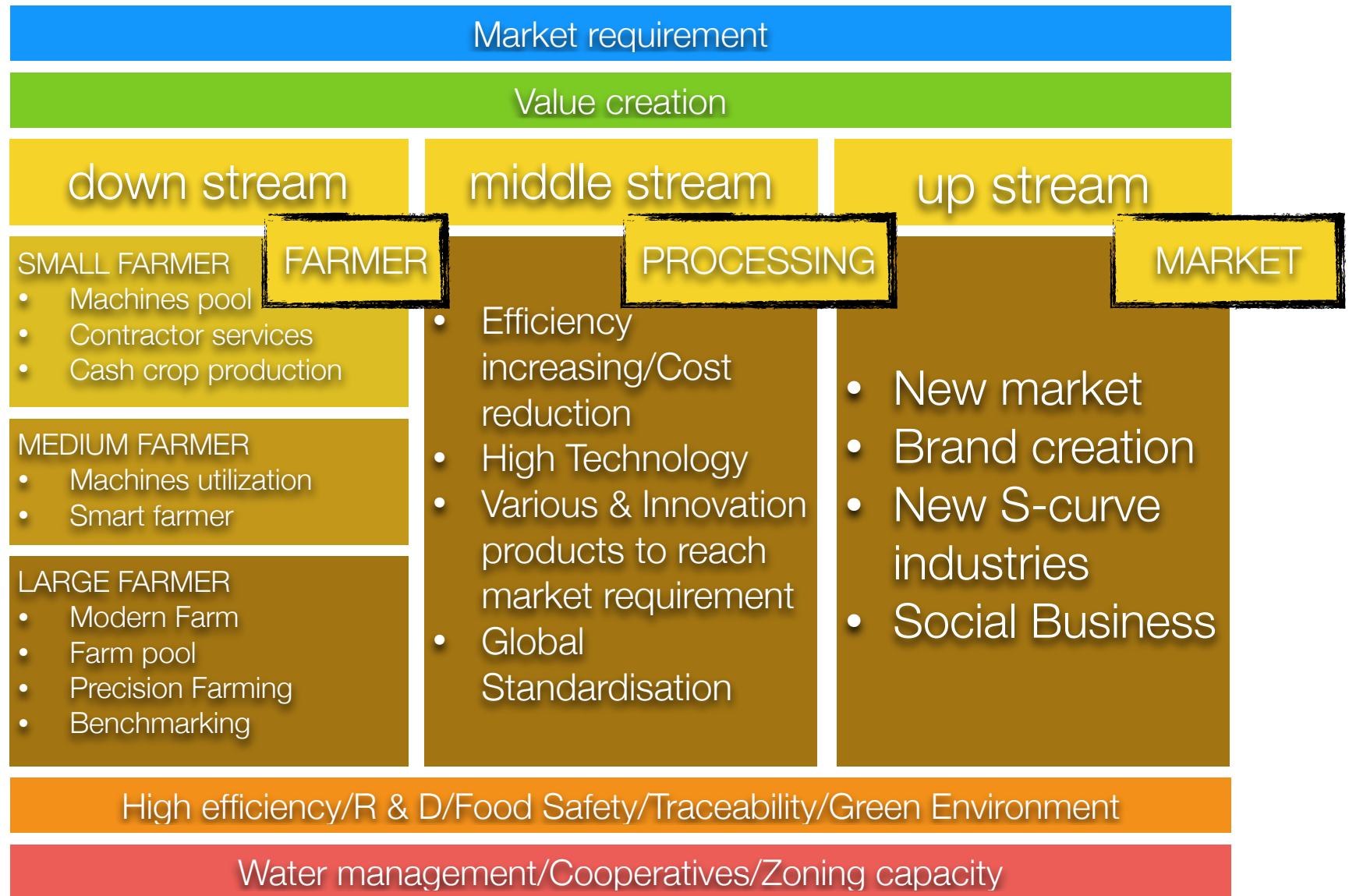
# Farm Machinery Usage by Ratio

HARVESTER	HOUSEHOLD	%
owned	52,652	0.93
contractor services	2,353,886	41.49
labor&others	3,255,912	57.39

## HARVESTER IN USAGE



# AGRICULTURE REFORM STRUCTURE




# MODERN FARMING CONCEPT

- ❑ using technology advancement to develop a better and more precise farming
- ❑ control variables such as soil and water for an increase in productivity
- ❑ improve the quality of products to meet the benchmark, making products more safe, hence qualify to be exported and traceability
- ❑ more environmental friendly

# Modern Farming Development Plan



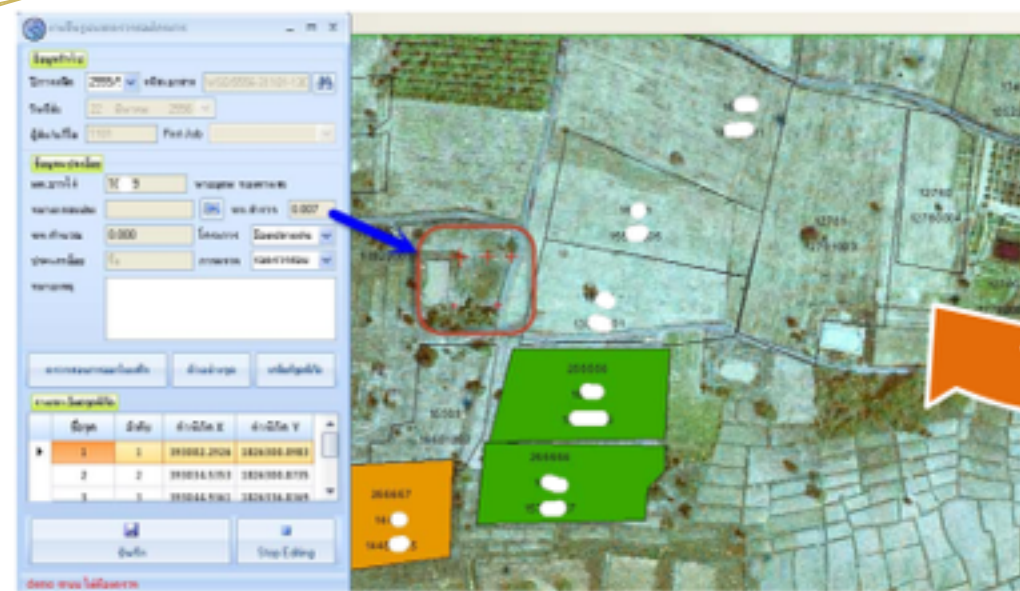
Major Commodity				Minor Com.
crops (rice, sugarcane, tapioca, rubber)	small animals (chickens, pigs)	large animals (cows, dairy)	fishery (shrimp, snapper, tilapia)	cash crops



Short term plans (6 months);  
improving cooperatives models; farmer grouping to do Modern Farm;  
to produce cash crops

Medium and Long term plans (> 1 year);  
research, development and innovation in agriculture;  
to adopt IT to be Application for agriculture and farmer registration

# PRECISION FARMING BASE ON INFORMATION TECHNOLOGY



Land Levelling Guidance

Precision Guidance

Precision Planting

Precision Cultivation

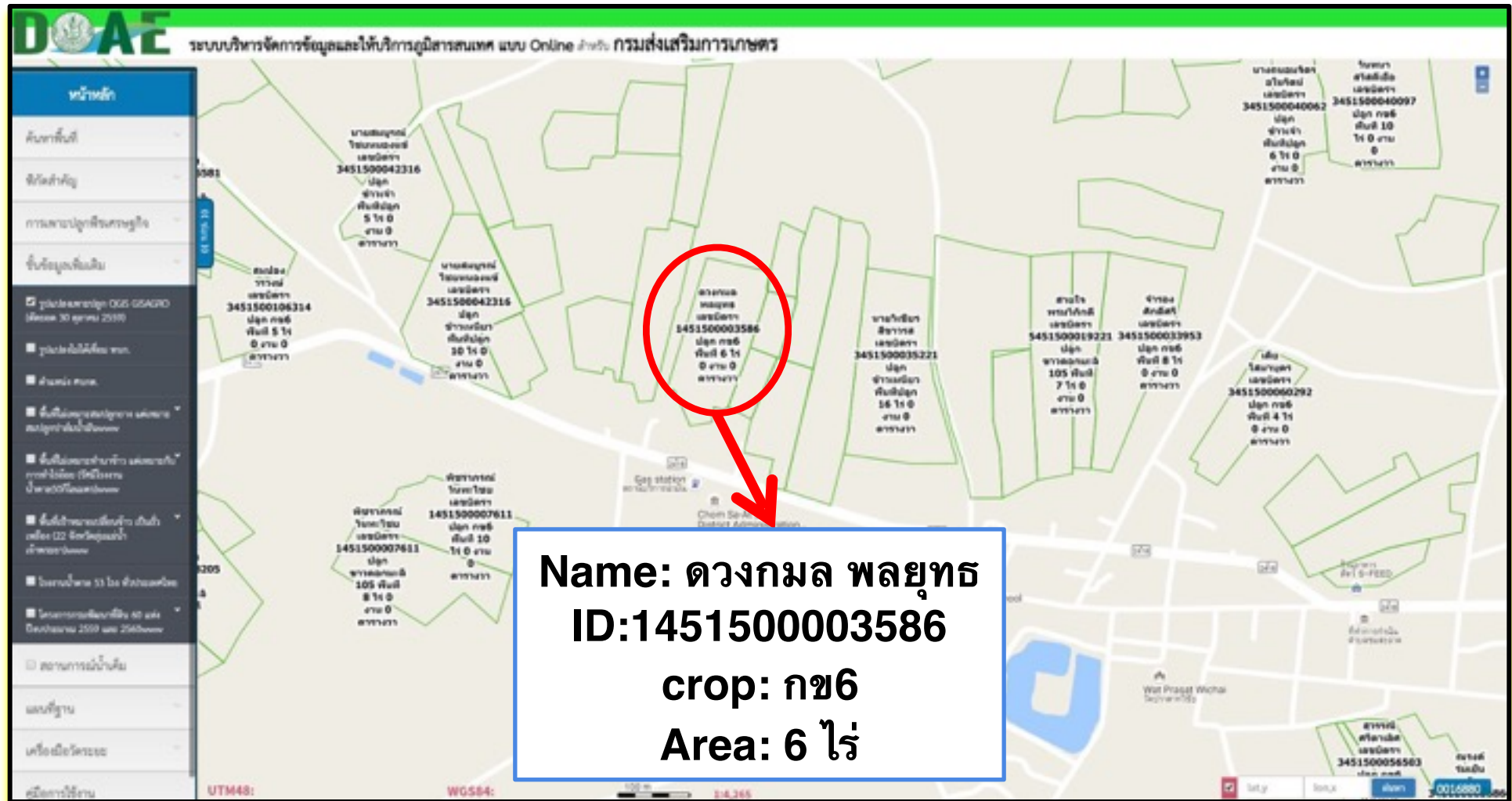
Yield Mapping Guidance

# PRECISION FARMING BASE ON INFORMATION TECHNOLOGY

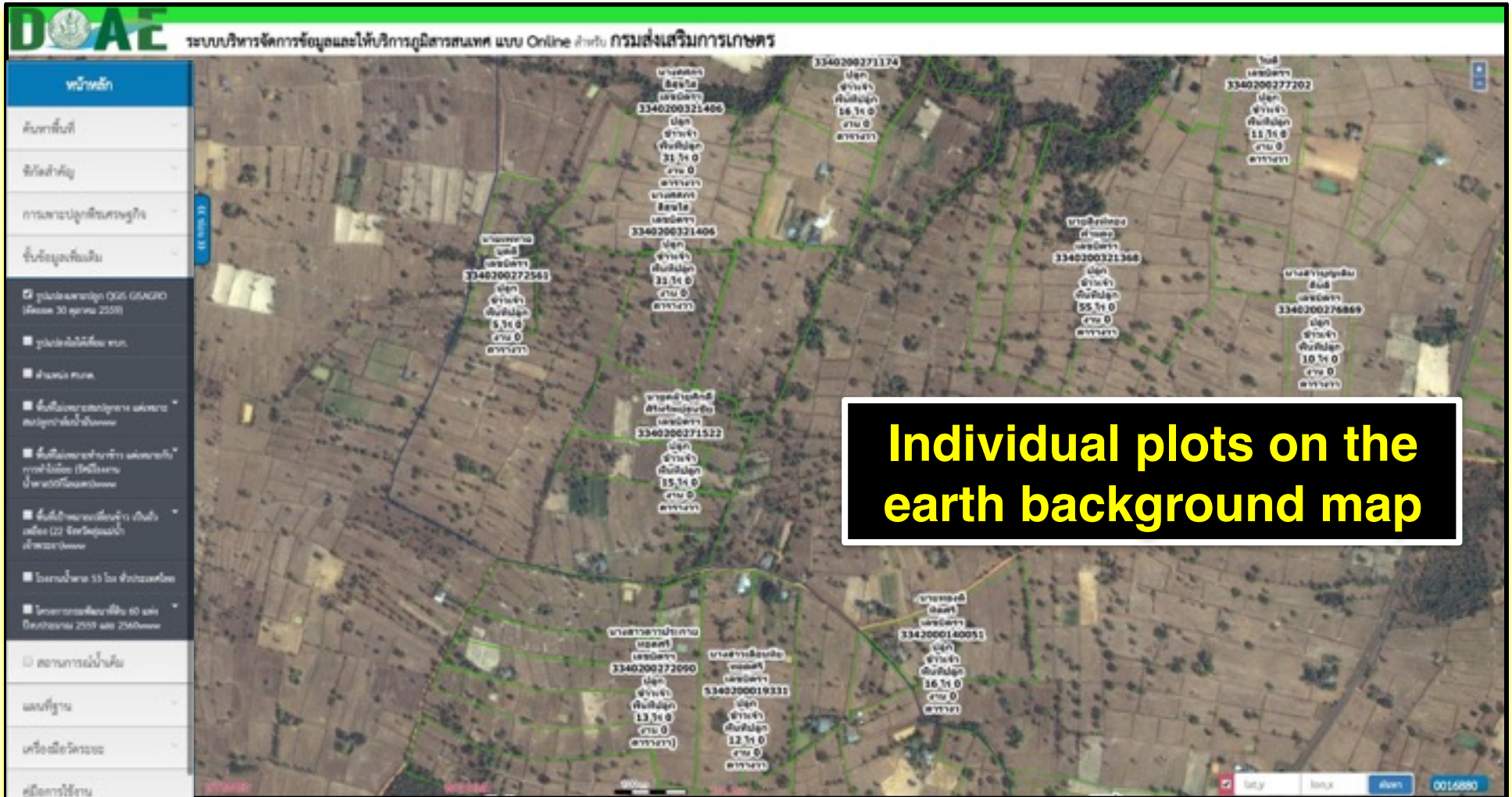


Individual farming plots Plotting Program preparing for Precision Farming

# PRECISION FARMING BASE ON INFORMATION TECHNOLOGY



# PRECISION FARMING BASE ON INFORMATION TECHNOLOGY



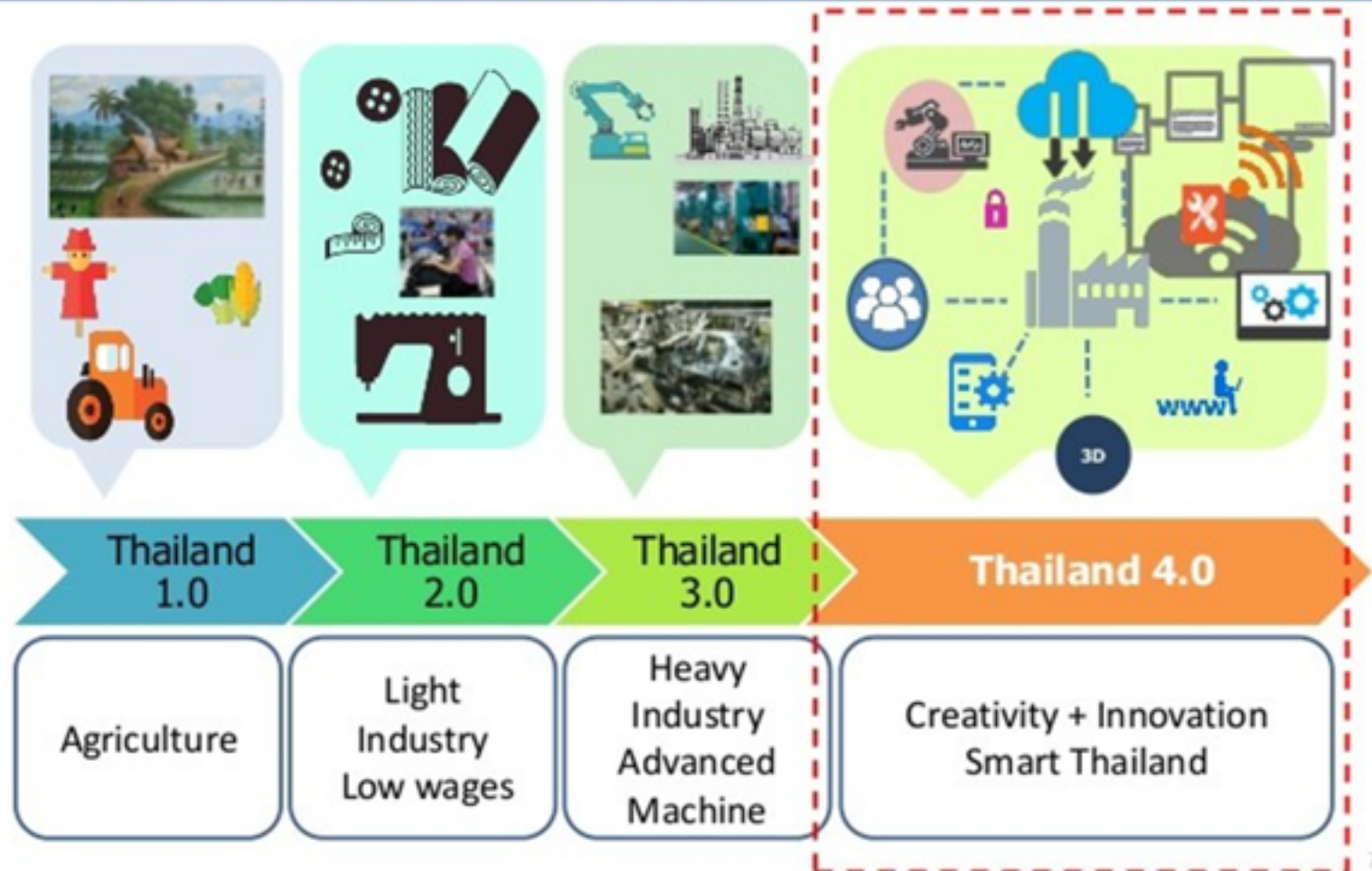
# **New Thailand 4.0 Policy Aims to Turn Country Into a 'Smart' One**

Thailand 4.0  
Thriving in the 21st Century  
through  
Security, Prosperity & Sustainability

- **Thailand 4.0 comes after three prior economic models**
- Thailand 1.0 focused on agricultural development
- Thailand 2.0 focused on upgrading low income households reach middle-income
- Thailand 3.0 emphasized on the growth of the industrial industry

# Thailand 4.0

(Smart Industry + Smart City + Smart People)



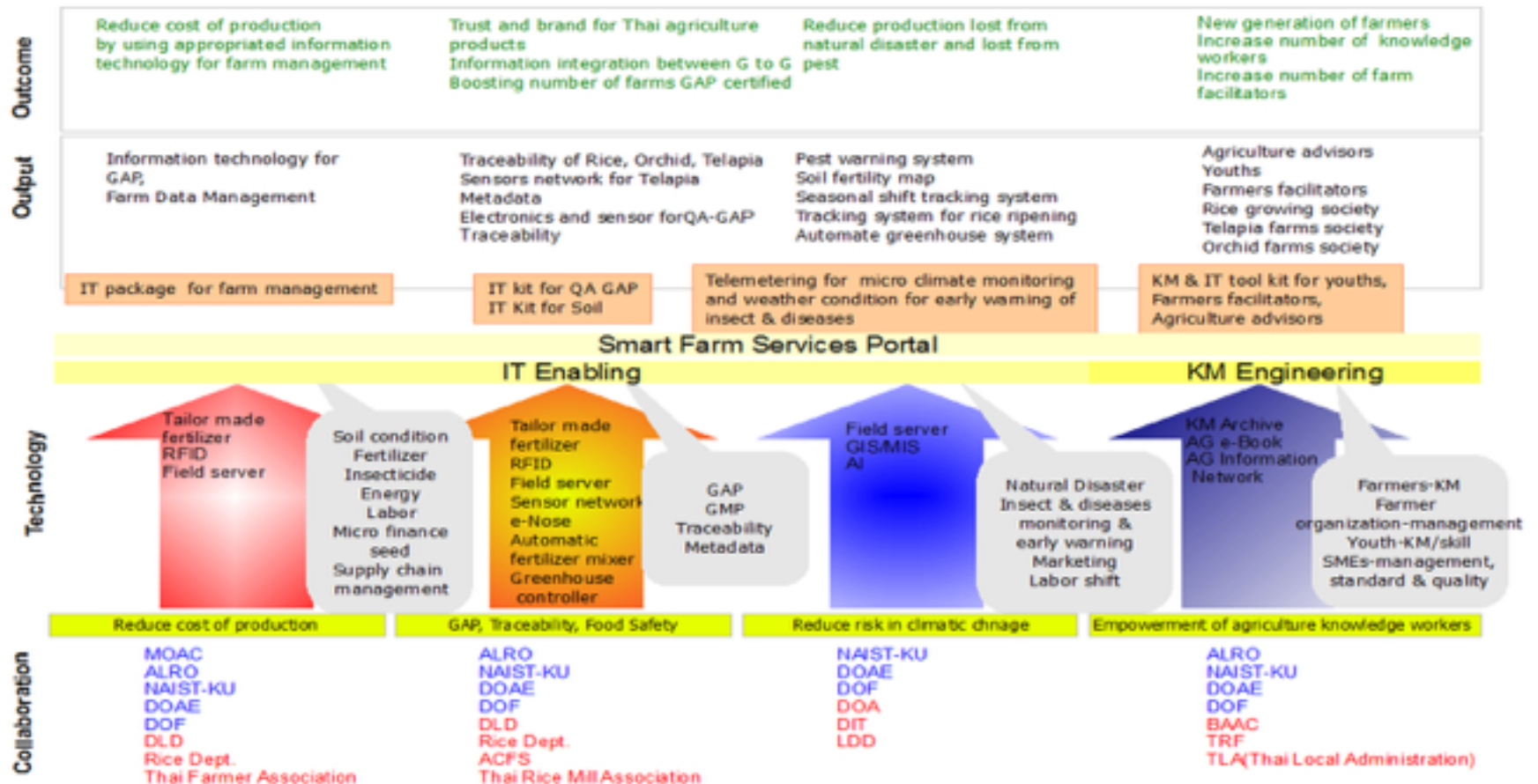
Thailand 4.0 will change the country's traditional farming to smart farming, traditional SMEs to smart enterprises, and traditional services to high-value services.

- The aim is to create creativity and innovation through the application of technology.
- As The Nation, the challenge of this model is getting the country to come out of its middle income trap.
- The government wishes to see farmers become entrepreneurs and SMEs to branch out of being tied to government assistance and to become startups that grow beyond their potential growth areas.

# technologies perspective

## Smart Farm

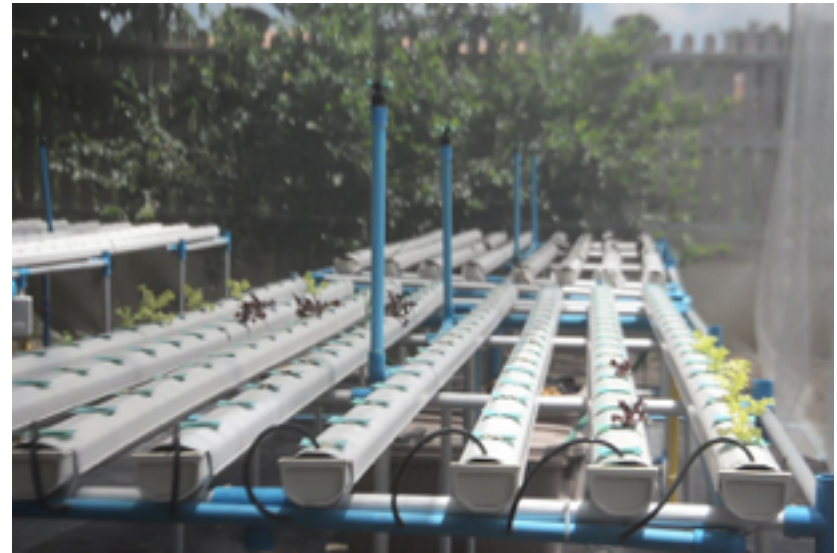
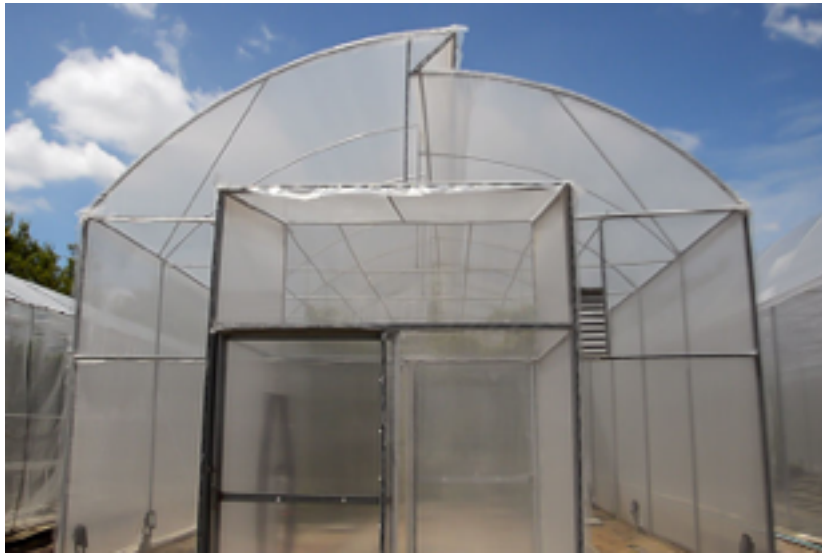
Flagship to support National Food Security, Food Safety & Creative Economy



# Robot Farmers

**SMART FARM**  
Faculty of Science  
Mahidol University







New design for  
smarter tropical greenhouse



New farm and orchard  
management



New approaches for  
Rice and field crops  
production

# Thank you.

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