

An aerial view of a modern agricultural farm. The landscape is lush green with various crops, including corn and rice. A large pond is visible on the left side, with a building and a covered walkway nearby. A paved road runs through the center, with a white van and a truck on it. In the background, there are rolling hills and mountains under a blue sky with scattered clouds. A drone is flying in the lower center of the image.

Smart and Sustainable Agricultural Mechanization: THAILAND CASE

By Ms.Nantaporn Angsukulthorn,CEO,KASETINNO

Challenges of Thai Agriculture



Thailand Agriculture

OVERVIEW

Agri-labor



12

Million
Person



Agri-Households



8

Million HH.



Land Utilization



24

Million Ha.

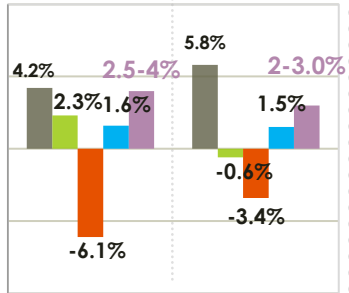


Land-owned/HH

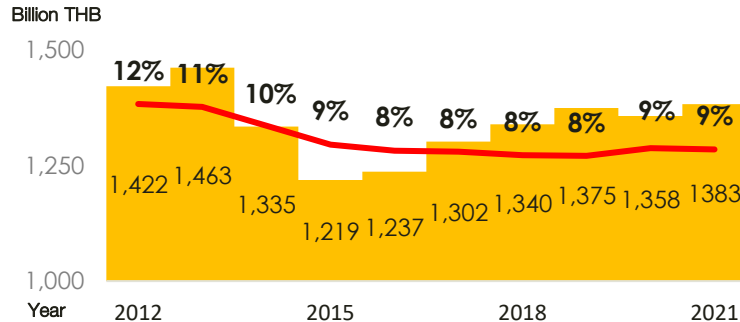


GDP

% Growth
Thai↓ Agriculture↓

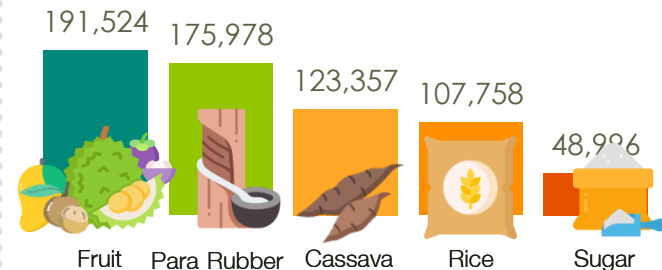


% of Agri-GDP (Billion TH) on Thai GDP



Agri-Export Value In 2021

Unit: MB.



Challenges in Agriculture Sector

Tasks towards elevating Thailand farmers to international competitive level

Agriculture Sector (31% of labor) is one of the main job that increases Thailand's GDP

But now only increasing economic value at around 8 - 9 % of Thailand's GDP



Onto Aging Society

: 80% of farmers are 45 years old or older



Farmer's household debt

: 230,000 average per household (58% of yearly income)



Low Technology Application

Poor access to innovation regarding increasing productivity



Product Decreases

: Lacks new agricultural technology, new types of plants, new techniques/knowledges



Relies on Exports & High Price Competition

Prioritizing competing with international prices



Lacks negotiability

: 90% of farmers owns less than 1.6 hectares individually



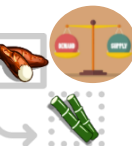
Drought & Poor access to water.

: There are only 23% area with proper irrigation.



Unpredictable weather, weed and pests

Natural factors resulting in efficiency decrease..



Lack of information on market's future demands

Quick crop change following market prices results in overproduction



Overuse of chemicals

Using too much chemicals is harmful to farmer's, community's, nature's well being as a whole.

AGRI-TREND In The Next 5 Years

Government Support

Export Endorsement

Futuristic Plants

Online Farmers

Increase Value And Productivity

BCG Model

- Apply technology to develop product, increasing product's quality and farmer's income



Increase production

- Zoning by Agri-map 134k rai
- Large Scale Farming 8,319 plots

Elevate high price product quality

Export

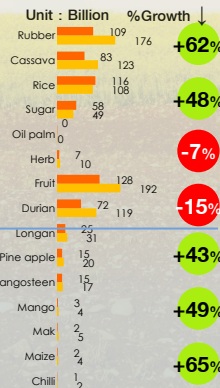
Jan - Dec

2020 2021

Increase quality

Organic / GAP

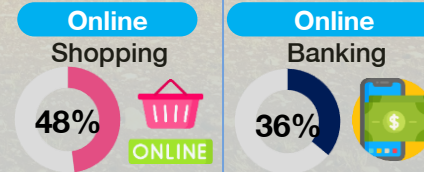
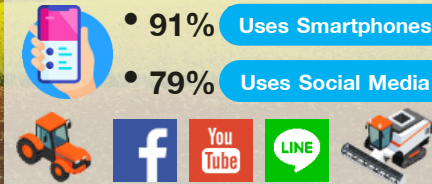
Promoted crop as strategy



Protein of the Future



Farmer's usage of social media in 2021



ข้อมูลจากการวิจัยกลุ่มเกษตรกรทั่วประเทศ ปี 2021



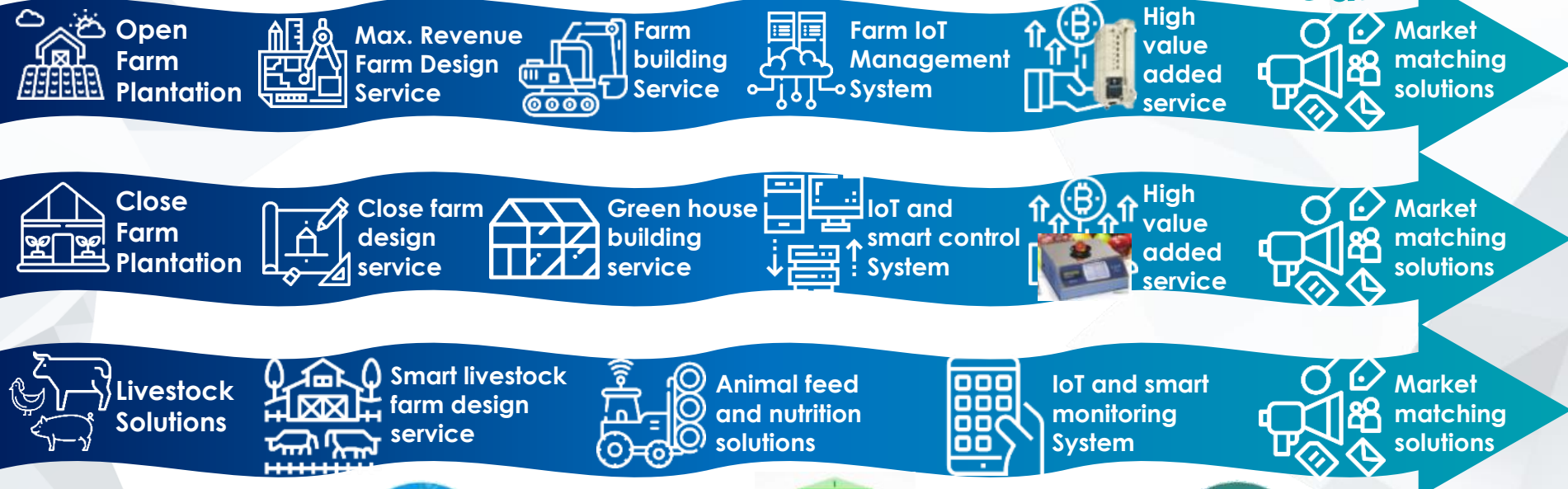
What is the Agri-
Innovation



“End to End Solutions”

Upstream

Downstream



Key Concept Driver



Max Revenue

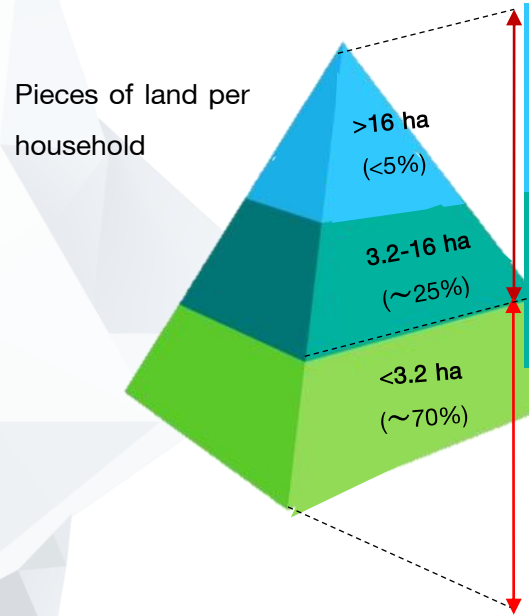


Smart & Precision



BCG Model

Customized Innovative Smart Farming With Farmers



- Major Farmer accounts for only 5% of all farmers
- Focuses on business planting, can invest in innovation on their own
- Middle Level accounts for 25% of all farmers, they get together (as LSF) to be able to use smart farming
- Economic sharing: Renting, Hiring
- Minor farmers are the majority (over 70%)
- Uses new theory agriculture, Khok Nong Na Model, to achieve sustainable life.
- If they can get together as LSF, they can also use smart farming



Examples of Modern Innovations For Farmers

1. IOT/Software for farm management. Displaying weather status, sensing and notifying diseases and pests, monitoring and predicting product.
2. IOT/software Machinery Management, for shared use.
3. Drone Solution in surveying, monitoring and product prediction.
4. Solution: Growing vegetables in greenhouses and outdoors
5. Agriculture SMEs.
6. Shared machinery use.
7. Increasing income stability
8. การปลูกพืชผสมผสาน/พืชหมุนเวียน
9. Digital platform providing agricultural services

Food

Environment



BCG ECONOMY

Water

End to End “BCG in Agriculture”

6 Sharing Economy

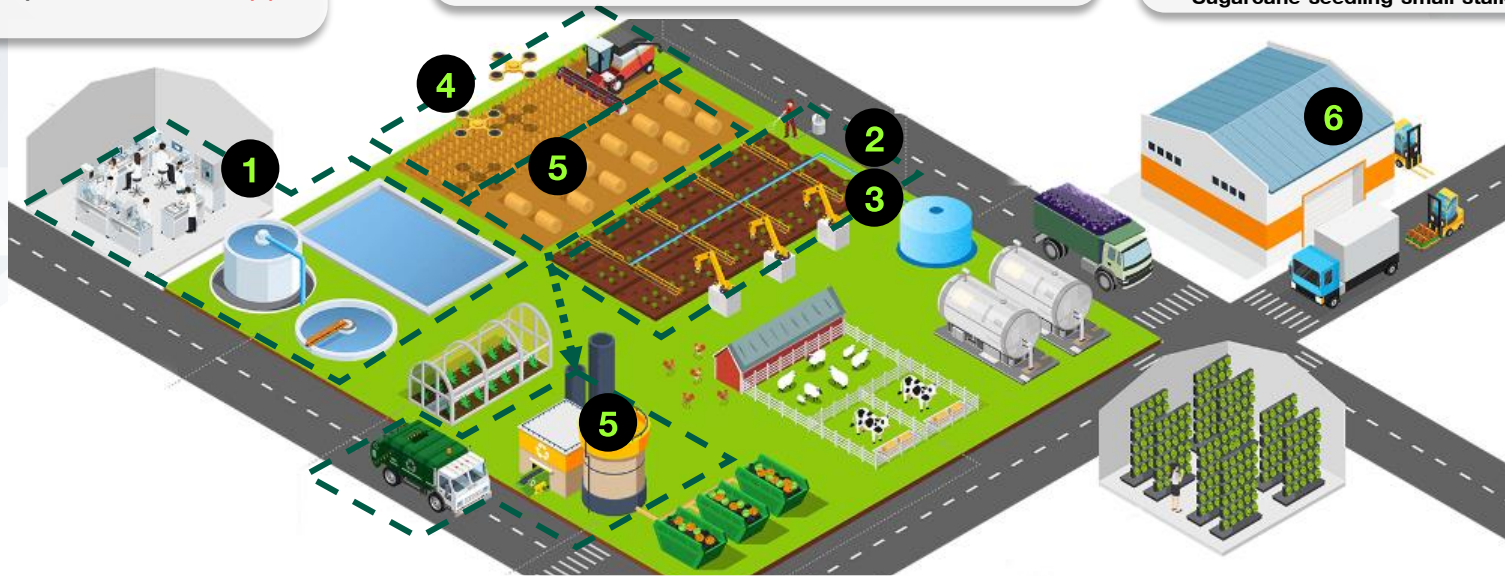
- Matching Platform (C)
- Rental Platform (C)
- Market place & E-commerce (C)

1 Soil Preparation

- Precision Land Preparation (Laser, soil testing) (G)
- Water management System (C)

2 Planting & Seedling

- Zero Broadcast (C)
- New Theory Agriculture ηηυηίηυ (C & G)
- Sugarcane seedling small stalk (B)



5 Post harvest

- Zero Burn Project (G)
- Add Value to Agriculture Residual (B) such as Biomass, Bioplastic, Bio packaging

4 Harvest

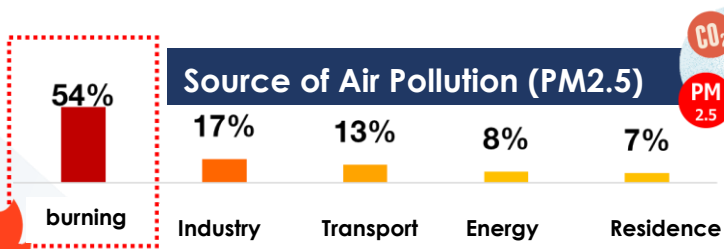
- Precision farming (C) (Crop production analytics)
- Reduce Loss during harvest process (C)

3 Maintenance

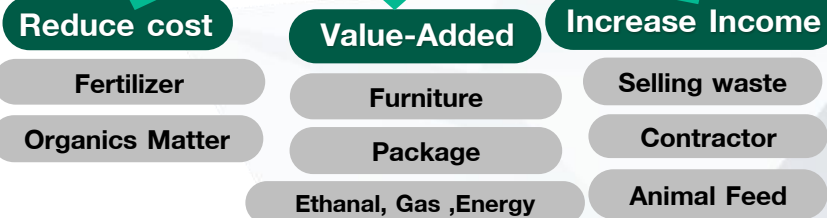
- KAS crop calendar & Organic practice (C & G)
- Crop analytics system (Farm management by IoT, Blockchain) (C & G)
- Precision Farming (Variable rate , Drone) (C)

• ZERO BURN & WASTE MANAGEMENT

To reduce PM2.5 pollution and additional benefit from soil improvement & income

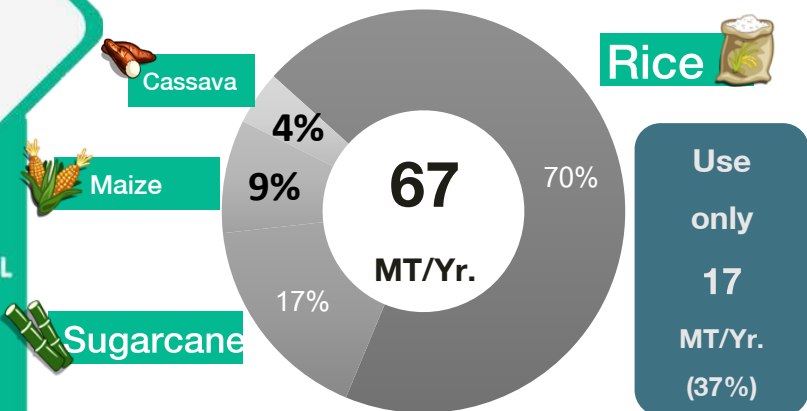


Economics value of waste >67 Billion/Yr.

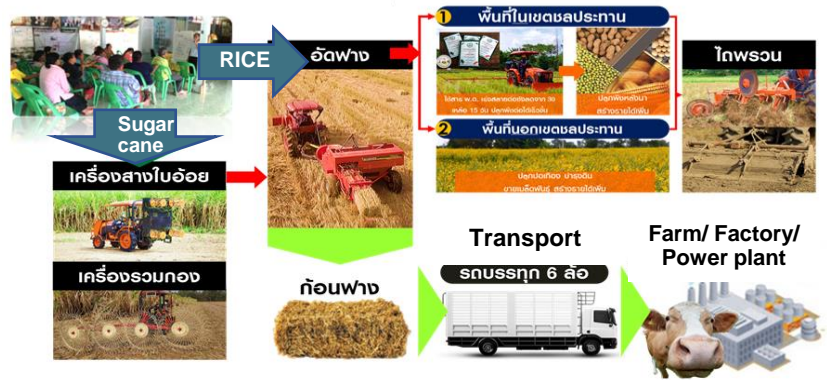


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Agri- Waste Quantity



Zero burn solution



ENVIRONMENTAL



• ZERO BROADCASTING

To reduce Seed and Fertilizer in Rice Planting process and increase yield

Planting Method



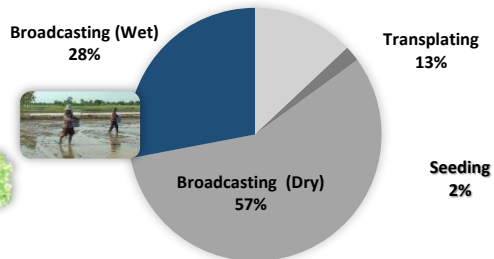
Rice
68.54 M.Rais

46% of Total Agri-landuse
46% of Total Agri-landuse

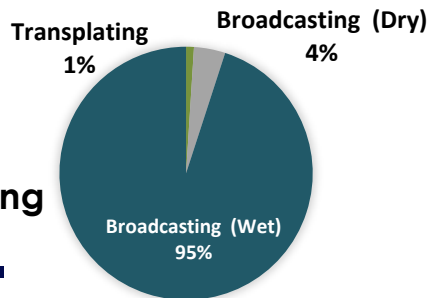
SEED use for planting
1.61 MT*

*on average 30 kg./Rais

• Primary Crop (2020/2021)



• Secondary Crop (2020/2021)



NEW Method



Transplanter

SEED use for planting
7-8 kg./Rais



Direct Seed

SEED use for planting
8-10 kg./Rais



T+Seeder

SEED use for planting
8-10 kg./Rais

>67%

Reduce Seed or Cost Reduction = 21 MB.

Seed Value 32.3 MB. / Yr. @ 20 B/Kg.

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ENVIRONMENTAL



• Reduce Methane(CH₄) in RICE Cultivation

Cooperate projects with many organization as THAI RICE NAMA project
To reduce emission e.g. CO₂, CH₄



THAI Rice NAMA



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Reduce water **43%**



Reduce fertilizer

377,000 ton/year



▽ **0.56-56** million ton of carbon



▽ **50** million ton of carbon

1. Land Laser Levelling



2. Soil Analysis for Fertilizing



3. Wet and Dry Solution



4. ZERO BURN & WASTE MANAGEMENT

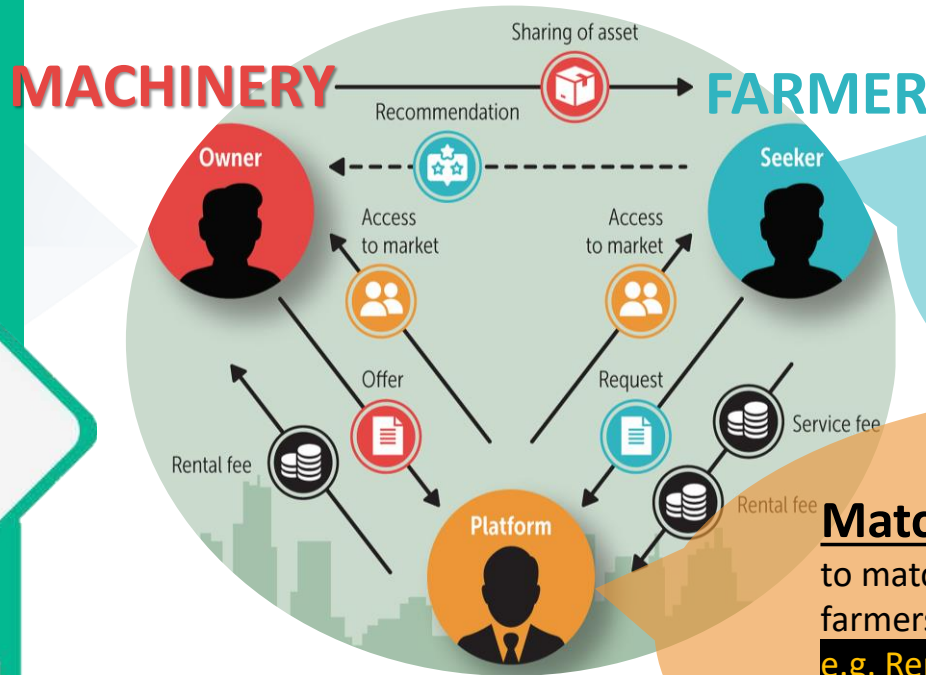


ENVIRONMENTAL



• Sharing Economy

Make Small Farmers can access to innovation and increase machinery utilization



Machinery Pool:

Utilize Government Budget

Software for operation

e.g. Machinery Management System + GPS telematics

As of 2022 : 1677 Groups



Matching Platform:

to match service/machine providers with farmers

e.g. Rental Platform,

Service Matching platform (Driver VS Farmers)

AS of 2022 : >2000 Users



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ENVIRONMENTAL





ลดต้นทุน



เพิ่มผลผลิต



เพิ่มรายได้

KUBOTA USE CASE

From Knowledge to Implementation

How to Promote Smart Farmer

Develop

End to End Solutions (KAS)

การจัดการ
เครื่องจักรกล
การเกษตร
(Machinery
Solutions)

เทคนิคด้าน
การเกษตร
(Agriculture
Solutions)

KUBOTA
(Agri)
Solutions

ZERO BURN
ZERO Broadcasting

Increase Productivity

Increase Profit

Reduce Cost

Environment Friendly

Transfer

KUBOTA FARM



- Precision rice farm and crop rotation New theory agriculture zone
- Para rubber, oil palm, wood
- Para rubber oil palm and fruits zone โยธา
- Modern agriculture, modern field crops farm zone

The farm creates a modern farming real experience for farmers using agricultural innovation And End-to-End solutions

Role Model

Siam Kubota Community Enterprise (SKCE)

► Strengthen farmers community, SKCE from upstream to downstream.

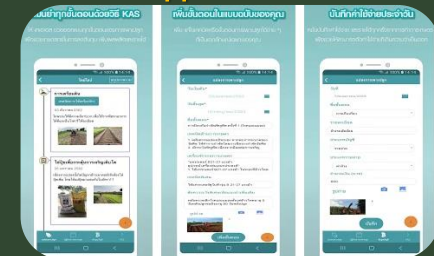


1. สหกิจชุมชนศูนย์ส่งเสริมและผลิตเมล็ดพันธุ์ข้าวชุมชนตำบลพิกากัน
2. สหกิจชุมชนศูนย์ข้าวชุมชนบ้านอู่เมต
3. สหกิจชุมชนกลุ่มทำนุห้วยตาผ้า
4. สหกิจชุมชนกลุ่มเกษตรผลิตเมล็ดพันธุ์ข้าวตอมีตาส
5. สหกิจชุมชนของฟักปุงพัฒนา

Scale Up

KAS CROP CALENDAR

Applications



Develop an application that standardize planting process to eliminate variability from external factors. resulting in increased productivity and not much difference each year.

LESSON LEARN AND RECOMMEDATION to be SMART FARMING

5 Main Topics

1. Knowledge Development

2. Knowledge Transfer to strengthen farmer's capability

3. Infrastructure Management

**Cost reduction
increase productivity**

**Reduce the risk of
external factors**

- Access to agricultural knowledge resource
- Access to essential information on agriculture
- Training agricultural innovation with Local Trainers

- Weather station to cover agricultural areas
- Land & Water management to be suitable for cultivation
- Easy access internet and coverage in all areas

LESSON LEARN AND RECOMMEDATION to be SMART FARMING

5 Main Topics

4. Access to agricultural machinery and agricultural innovations

- Supporting the integration of large-scale farm (machinery pool) effectively

cooperation from all sectors

- Group set goals. have a sense of owner
- Government support initial investment or low interest
- Private sector provides knowledge on machinery and management system



- Promote the agricultural machinery rental & service provider matching platform for small area farmers

KINRENT KINMATCH

5. Market for sustainable income

- Access to market data on quantity, demand and price for accurate cultivation planning.

- Expand new markets for sustainability
Create new opportunities to sell online.

- create added value and processing agricultural products

A man and a child are shown in a futuristic, digital landscape. The man is standing and interacting with a glowing, wireframe sphere of light. The child is sitting on a rock, wearing a VR headset. The background is a dark blue sky with a network of glowing lines and points, suggesting a digital or virtual environment. The overall mood is one of exploration and technology.

**Welcome To The
Next Decade**