SOMPO HOLDINGS | Innovation for Wellbeing
Sompo Japan Nipponkoa

Our Efforts in Agricultural Market in SEA

-Case of Myanmar & Thailand-



Mar 16th 2018
Ken Gohara
Alternative Solutions Section
Commercial Risk Solutions Department

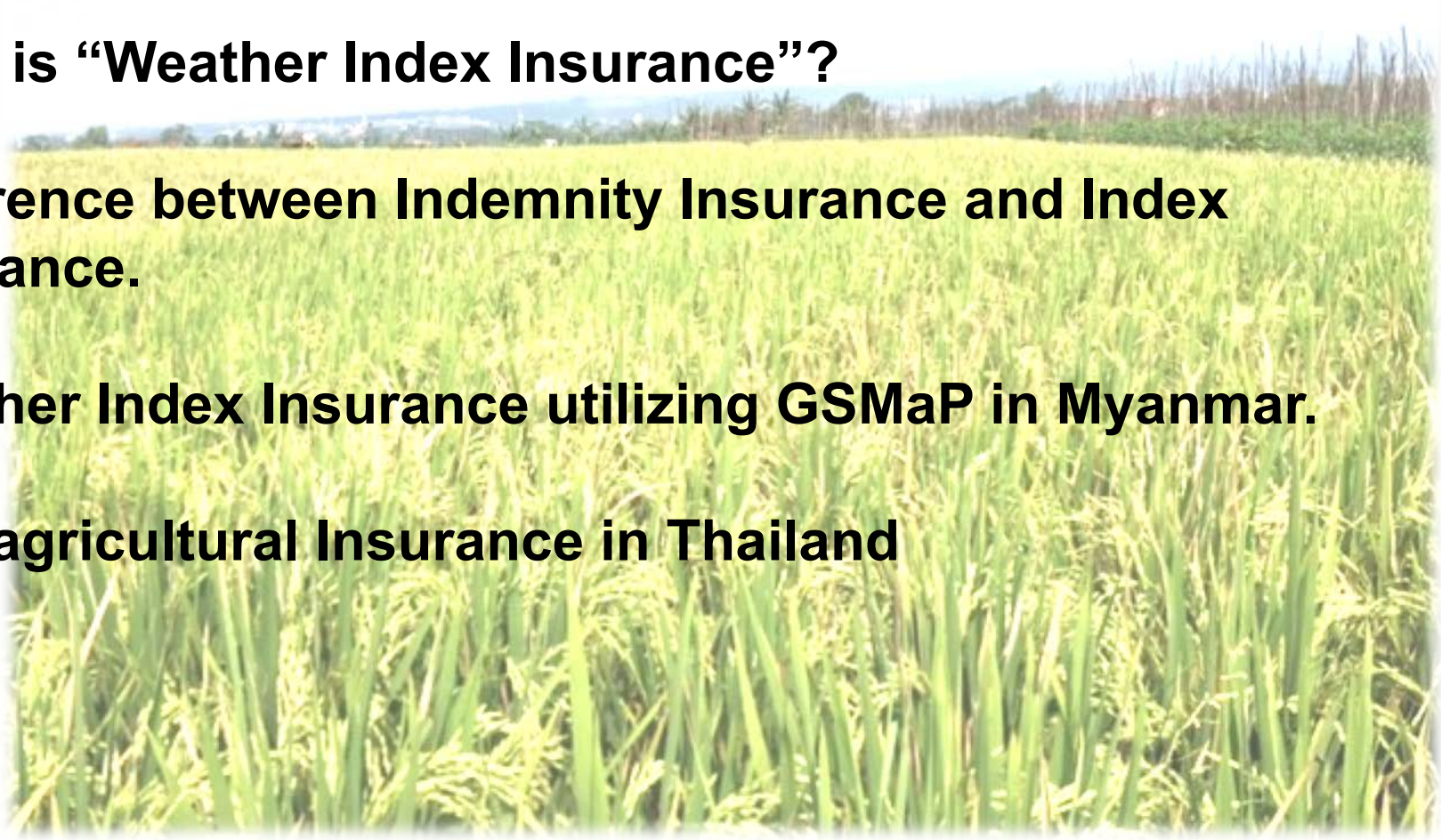
Corporate Profile

Name : Sompo Japan Nipponkoa Insurance Inc.
Established : October, 1888
Total Assets : 70 Billion yen
Head Office : 26-1,Nishi-Shinjuku 1-chome, Shinjuku-ku, Tokyo 160-8338, Japan
Employees* : 27,144
Agencies* : 64,371 (Operate in 211 cities and 32 countries)

*** As of March 31, 2015**

Outline

1. Background
2. What is “Agricultural Insurance”?
3. What is “Weather Index Insurance”?
4. Difference between Indemnity Insurance and Index Insurance.
5. Weather Index Insurance utilizing GSMaP in Myanmar.
6. New agricultural Insurance in Thailand



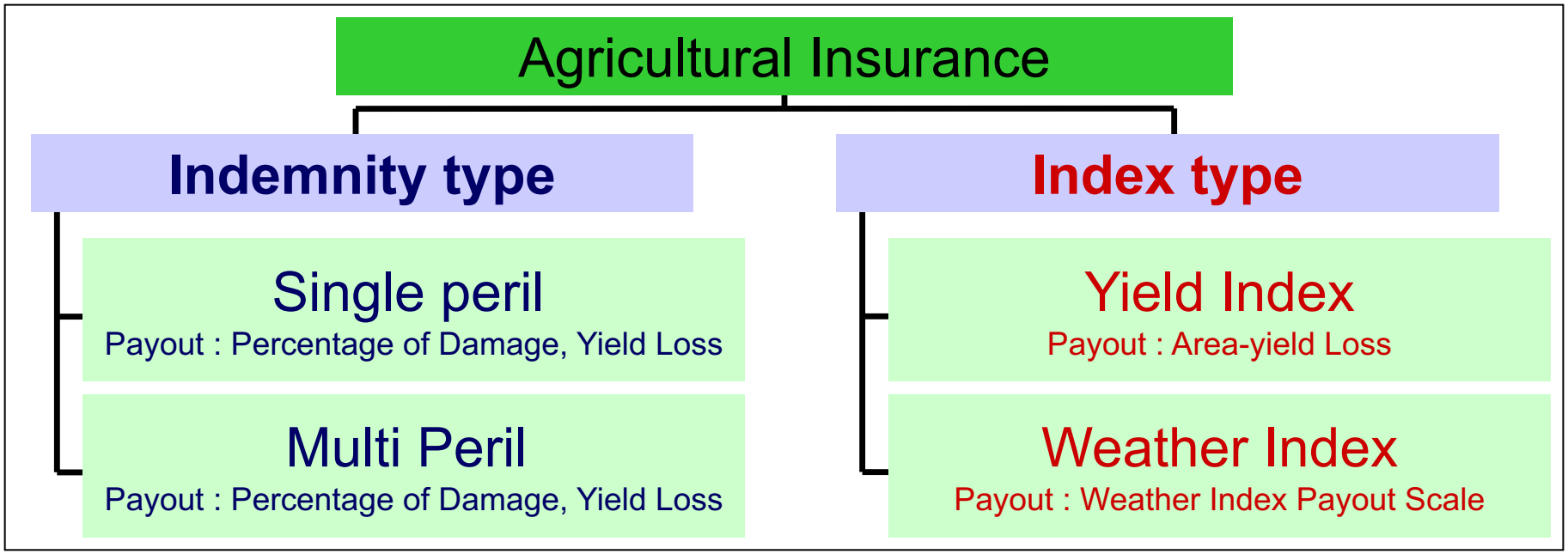
Background

- Progression of climate change would increase the frequency of extreme weather events such as heavy floods and drought.
- That is big problem for farmers in developing countries where depend on agriculture.
- Small farmers in developing countries need “adaptation measure” for the climate change.
- As one of “adaptation measure” for agriculture is to familiarize **agricultural insurance**.

Agricultural Insurance

What is Agricultural Insurance?

- ✓ Designed to cover economic loss to agricultural producer caused by drought, heavy rain, hail and other natural disaster beyond control of farmer.
- ✓ Sold in 70 countries world wide.
- ✓ Classified into two type insurance, “Indemnity type” and “Index type”.



What is Weather Index Insurance?

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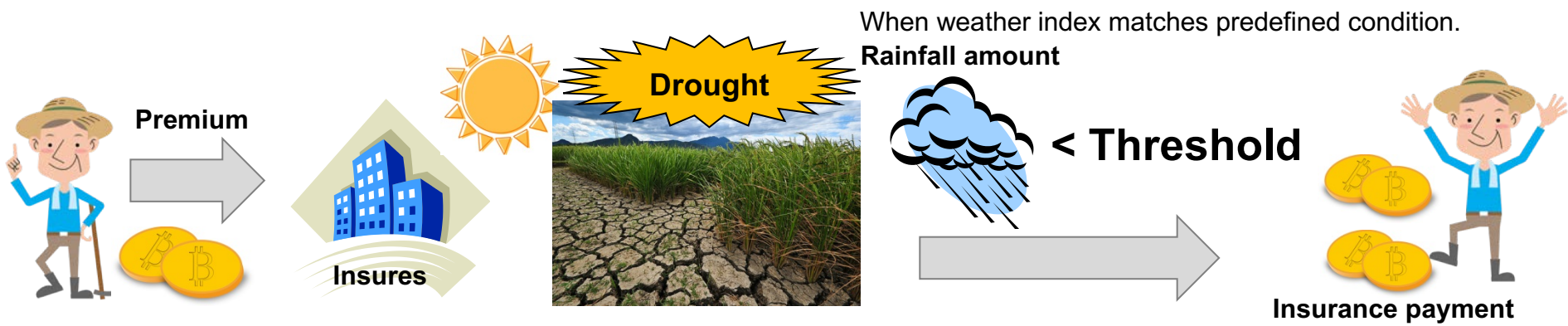
“Weather Index Insurance (WII)”

- Compensates farmer’s loss due to extreme weather such as heavy rain and drought, based on predefined weather index.
- Compensation is done when weather index matches predefined condition.
- Loss investigation by insurance company is not required.

Insurance system (Case of WII against drought risk)



Difference between “Indemnity” and “Index”

	Crop Insurance Indemnity basis type insurance	Weather Index Insurance Index basis type insurance
Trigger	**Covered Peril** (Natural Disaster, Disease, Insect, etc.)	**Weather Index** (Rainfall, Temperature, Snow fall, etc.)
Trigger of Compensation	When insured suffer damage due to covered peril	When weather index matches the predefined condition
Payout	Actual Loss Amount	Predetermined Fixed Amount
Loss Survey	Necessary	**Not necessary**
Swift Payment	----------	**Swift**
Moral Risk	Existence	**Nonexistence**
Basis Risk*	**Nonexistence**	Existence

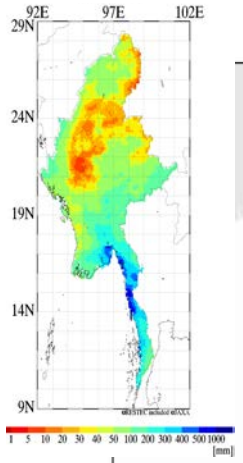
* ”Basis Risk” means deviation between actual loss amount and payout amount by insurance.

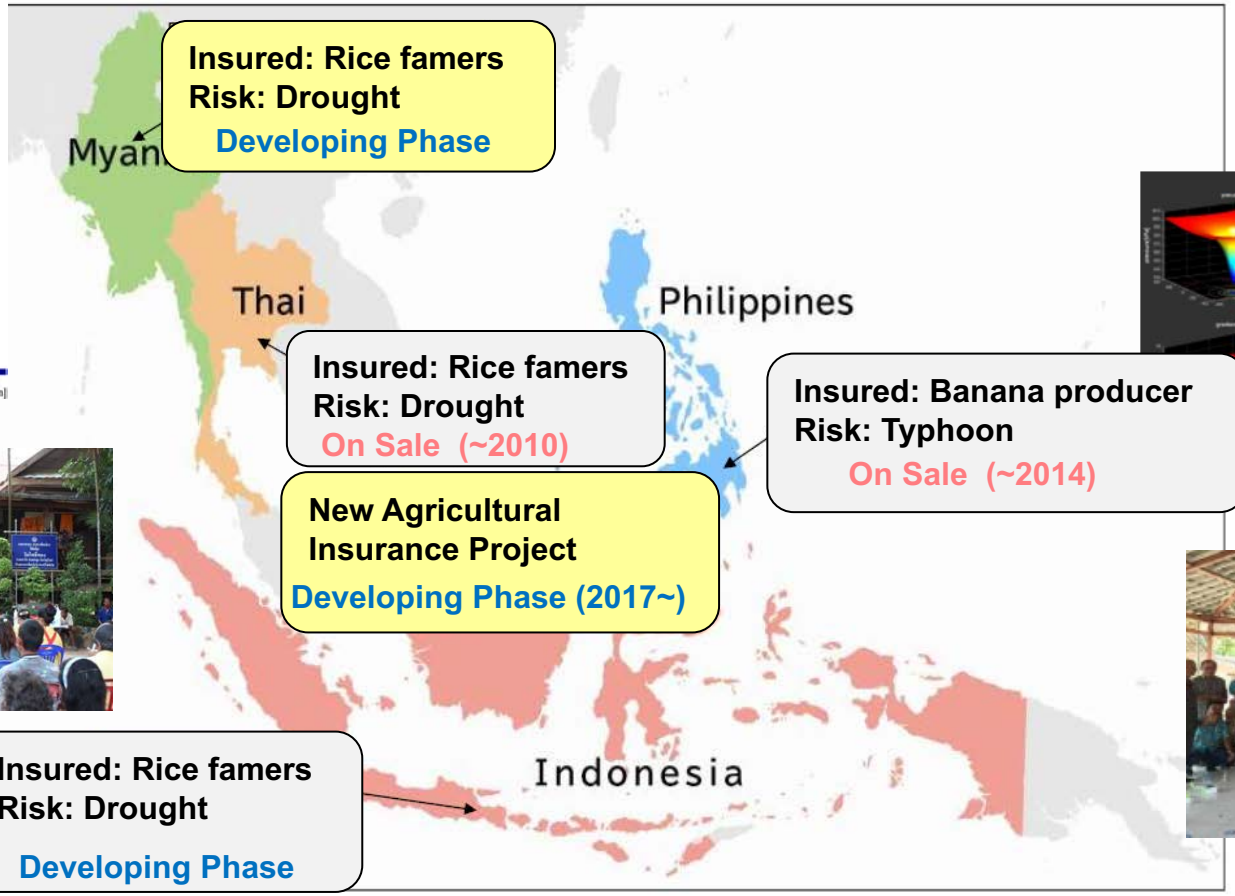
Many countries tend to prefer Index Insurance because of three advantages.

No loss survey **Swift payment** **No moral risk**

Our Efforts of Agricultural Insurance in SEA

Sompo has provided and developed the “Weather Index Insurance” in Southeast Asian countries, Thailand, Philippines, Myanmar and Indonesia.





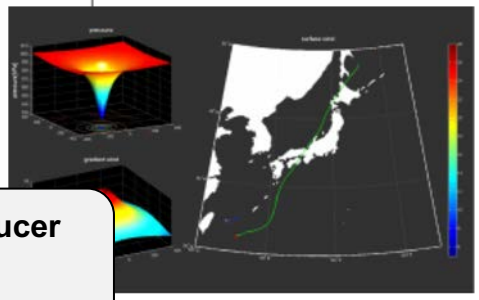
Insured: Rice famers
Risk: Drought
Developing Phase

Insured: Rice famers
Risk: Drought
On Sale (~2010)

New Agricultural Insurance Project
Developing Phase (2017~)

Insured: Banana producer
Risk: Typhoon
On Sale (~2014)

Insured: Rice famers
Risk: Drought
Developing Phase



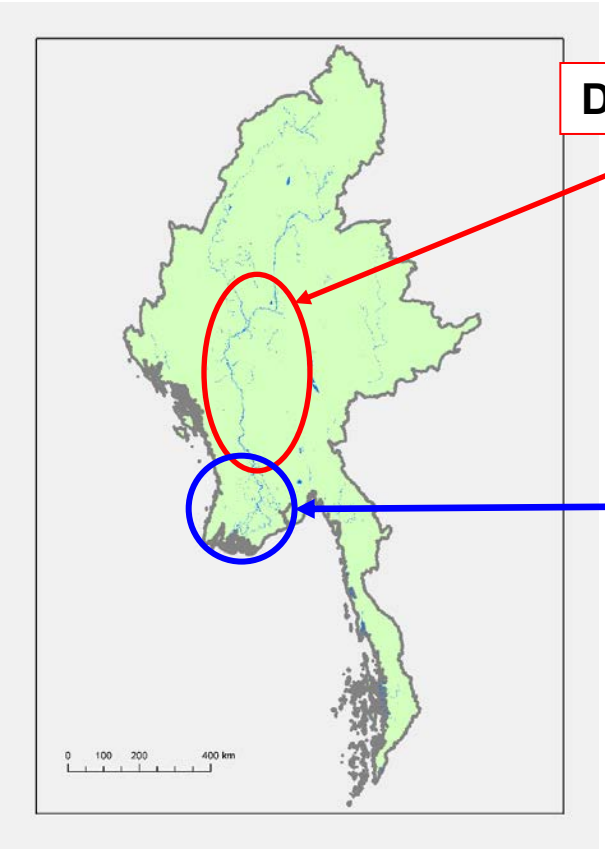
Myanmar

Population : 51.41 million(2014)
Size : 680,000km^2
Main Crops: Rice, bean, sugar cane, corn, sesame, etc.

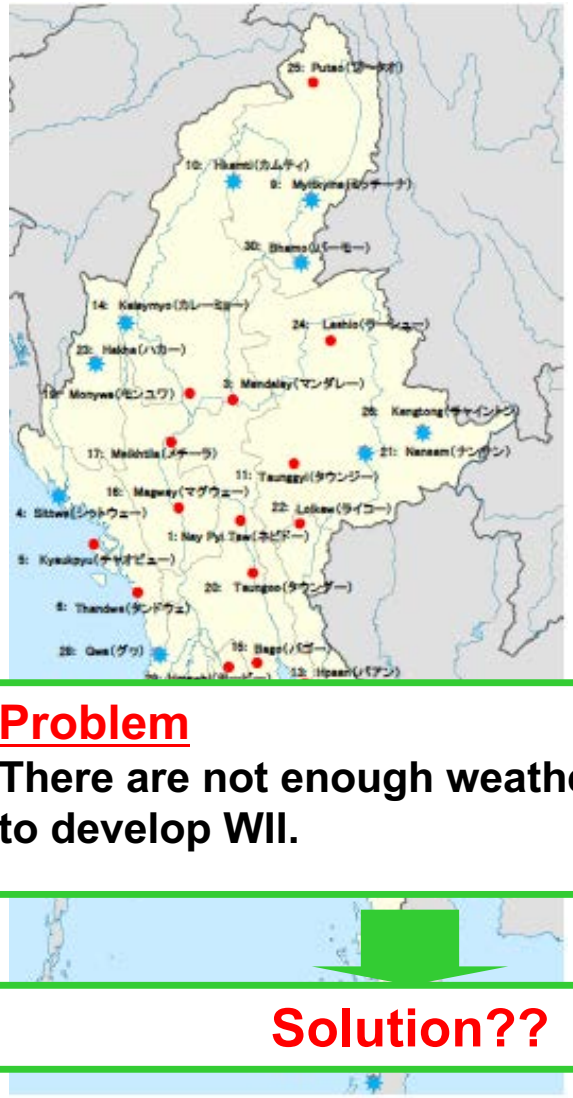
In 2014, Sompo Japan Nipponkoa Insurance Inc., Yangon Representative Office, started developing WII using GSMaP data in an effort to mitigate losses suffered by rice farmers due to drought in Myanmar.

Background of developing WII using GSMaP data

Weather Risk for farmers in Myanmar



Weather Station



Problem

There are not enough weather stations to develop WII.

Solution??

What is GSMaP data?

GSMaP

- Official Name is “Global Satellite Mapping of Precipitation”.
- System to estimate rainfall and deliver its information four hours after observation
- Disclosed by Japan Aerospace Exploration Agency (JAXA)
- Data sources are multiple satellites all over the world.
- Almost all area on the Earth is covered.

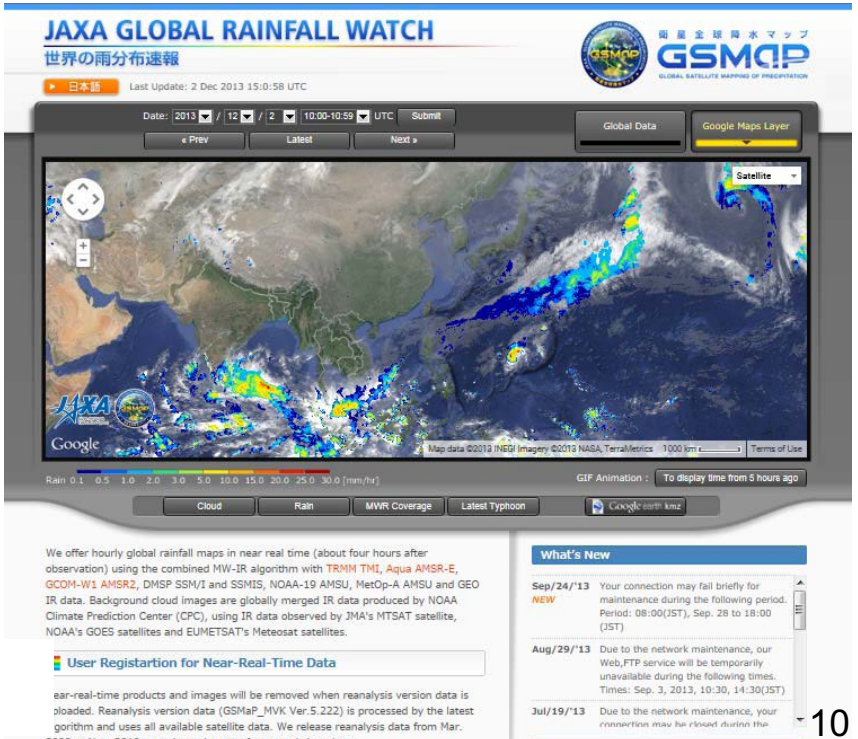
Description of rainfall data

Variable	Rainfall rate (mm/h)
Domain	Global (60N~60S)
Grid resolution	0.1degree (≒10km)
Temporal resolution	1hour

Advantages of GSMaP data

- The risk of data missing is extremely **low**.
- We can get rainfall data at **anywhere**.

<Image of GSMaP>

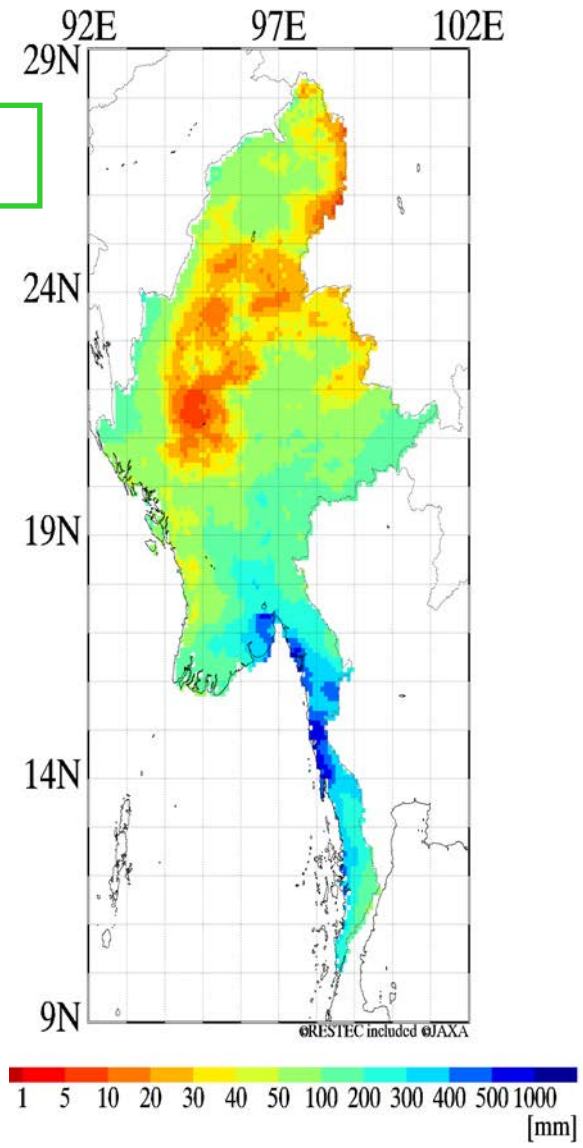


'Global Rainfall Map in Near-Real-Time (GSMaP_NRT) by JAXA Global Rainfall Watch' was produced and distributed by the Earth Observation Research Center, JAXA.
http://sharaku.eorc.jaxa.jp/GSMaP/index.htm

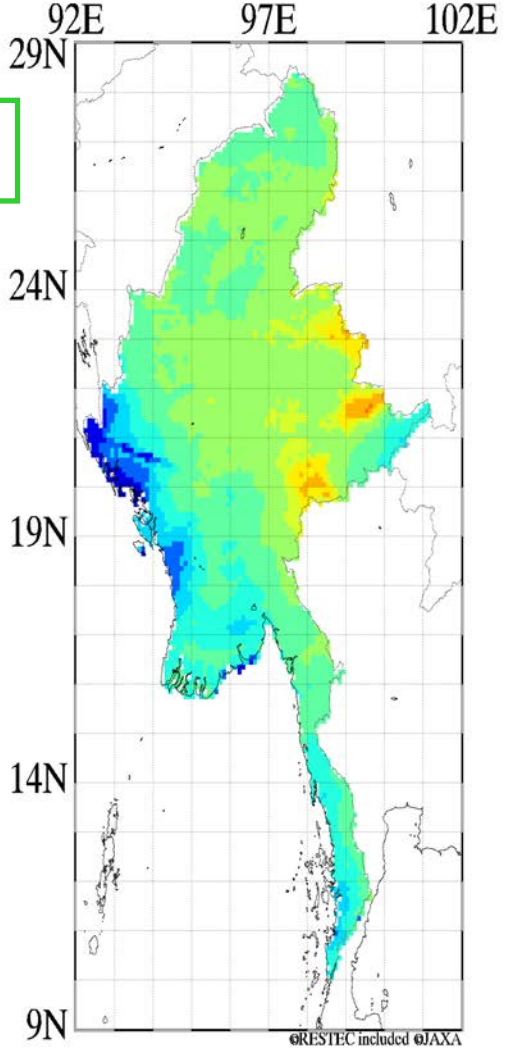
Image of weather index utilizing GSMaP data

Image of rainfall calculated by RESTEC

May 2005
Drought Year



May 2010
Normal Year



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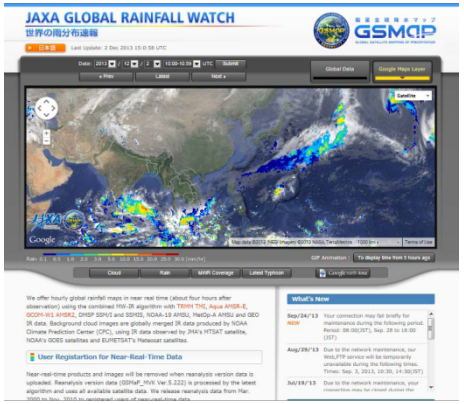
Provided by RESTEC

GSMaP data providing scheme

GSMaP Data Providing Scheme

- ✓ Disclose GSMaP data (Raw data)
- ✓ Calculate and make weather index based on predefined condition
- ✓ Provide weather index to SOMPO and sales channel * (*If necessary)
- ✓ Decide the insurance payout based on weather index



GSMaP data (Raw data)

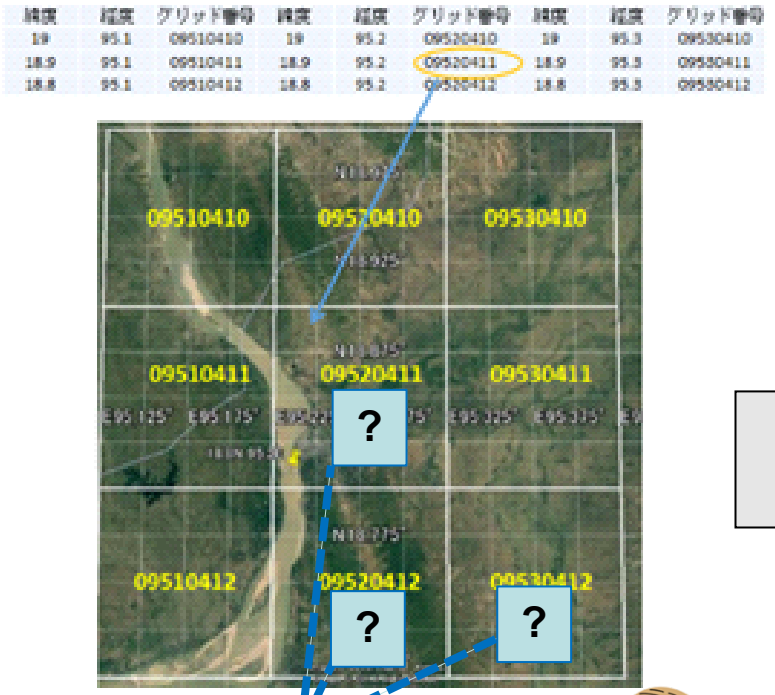
Weather Index

-Company name
Remote Sensing Technology of Japan
-Headquarter
Tokyo
-Established
Aug. 1st , 1975

Sales Channel

Developing App

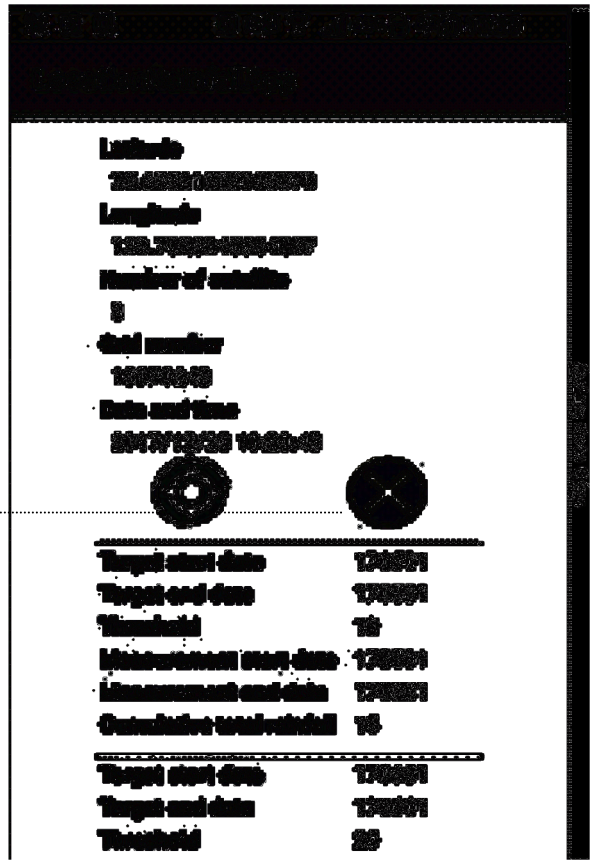
Grid of GSMaP



?

Detail Address
(Latitude/Longitude)

Special app for farmers



- Get location information.
- Know the suitable grid of GSMaP automatically.

Administration of Weather Index Insurance utilizing GSMaP

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Farmer

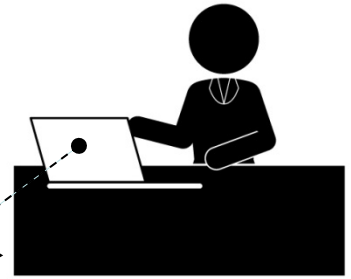
(1) Farmer gets location data of rice field utilizing the special app.

Longitude / Latitude

(2) Sales channel manages individual insurance contract and insurance condition.

Insurance application

Sales Channel (Bank, MFI)



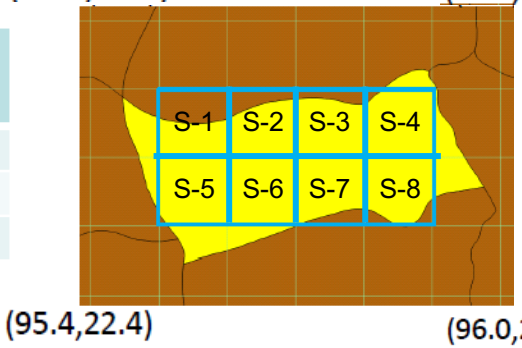
Insurance Company

(3) Insurance Contract

Notice insurance information

<Image of contract management>

Name	Towns hip	Grid Number	Insured Loan Principal	-
Farmer A	Shwebo	**S-1**	300,000kyat	-
Farmer B	Shwebo	**S-3**	450,000kyat	-
…	…	…	…	-



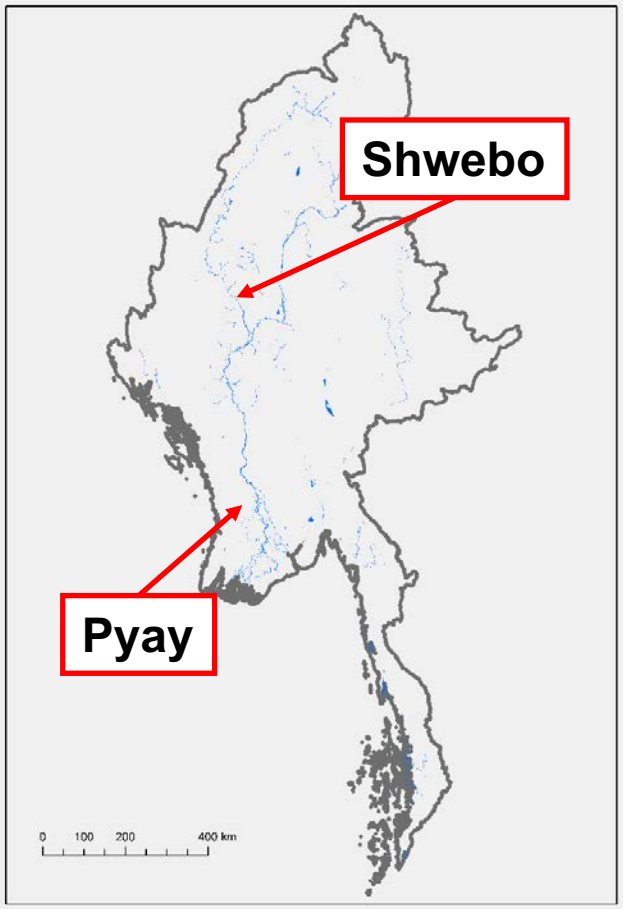
GSMaP grid in Shwebo

Hearing Survey

Prototype of WII utilizing GSMaP data

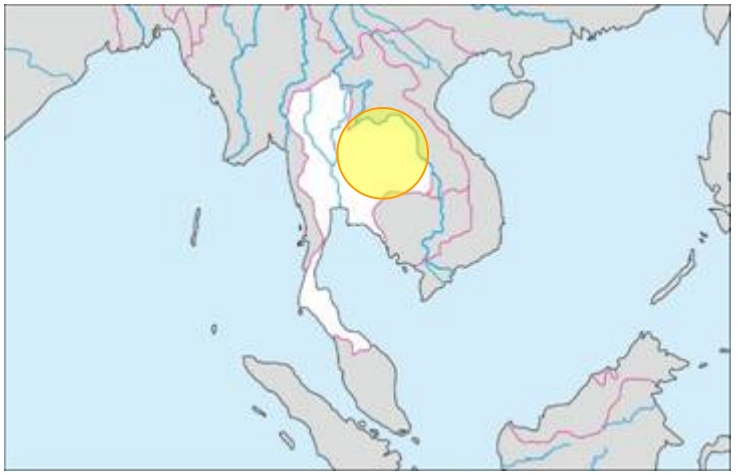
Prototype of WII in Myanmar

Insured	Farmers
Target Crop	Rice
Target Area	Shwebo, Pyay
Target Risk	Drought
Index	Cumulative rainfall by GSMaP during rainy season
Compensation	When the index is below predefined threshold, the predefined payout is done.



Thailand

Population : 65.93 million (2010)
Size : 514,000km^2
Main Crops: Rice, sugar cane, cassava, etc



Since 2017, Sompo started new project that develop estimation yield model utilizing satellite data and deep learning scheme, and new agricultural insurance utilizing the estimation yield model.

Project

Project Title

Developing “New Agricultural Insurance” utilizing “Paddy Yield Estimation Model”

Project Period / Area

October 2017 ~ March 2018/ Northeast Thailand

Project Team

SOMPO Groups , **Remote Sensing Technology Center of Japan**

University of Tokyo , **Japan Aerospace Exploration Agency**

Local Partner

Objective 1

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To develop "Paddy Yield Estimation Model" utilizing big-data such as earth observation satellite data, and deep-learning scheme.

Image of Paddy Yield Estimation Model

Growth Processes of Paddy/Rice

Input

Earth Observation Satellite Data;
(Weather-data, Land-data, NDVI, etc.)

Calculation

Deep learning

Output

Future Estimated Yield

Input

Earth Observation Satellite Data;
(Weather-data, Land-data, NDVI, etc.)

Calculation

Deep learning

Output

Estimated Yield

Objective 2

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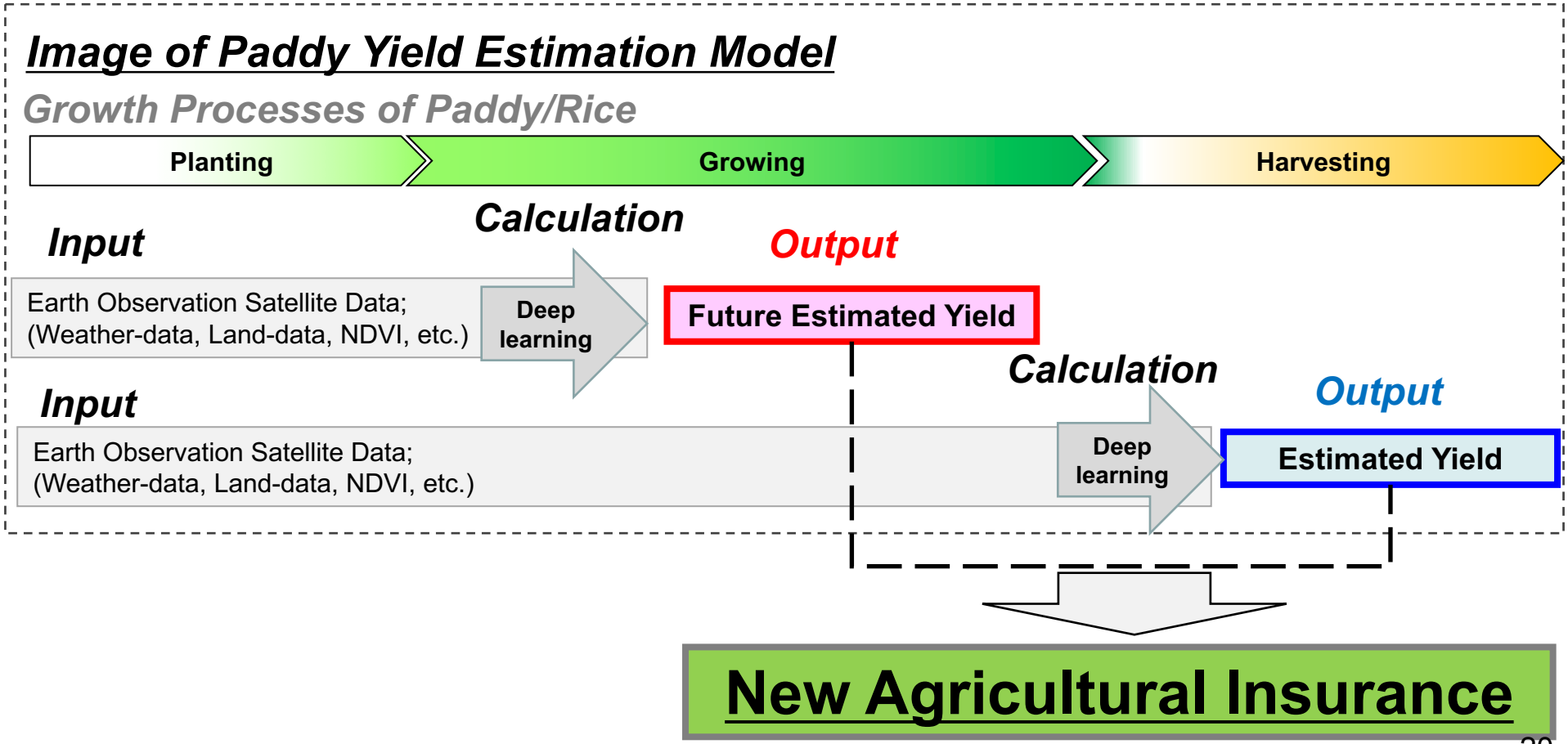
To develop "New Agricultural Insurance" utilizing "Estimated Yield" by "Paddy Yield Estimation Model".



Role and Process Flow of Project

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RESTEC JAXA 東京大学 THE UNIVERSITY OF TOKYO SOMPO HOLDINGS & Local partners

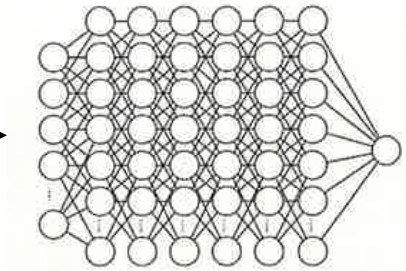
Collecting big-data

e.g. **Weather data**

NDVI data

Land-covered data

Deep-learning



Future Estimated Yield

outputted by model in growing season of rice

Estimated Yield

outputted by model in harvest season of rice

Actual yield
from statistic information

Accuracy verification

Future Estimated Yield

Estimated Yield

(Farmers)

Starting sales

Getting approval

New Agricultural Insurance

New Agricultural Insurance

Insurance	***Estimated Yield by model***
1) Index-based Insurance	Future Estimated Yield
2) Hybrid-based Insurance	Estimated Yield

1) Index-based Insurance

Type of Insurance	Index-based Insurance
Insurance Period	4 month (e.g. from May to September)
Index	**Future Estimated Yield** Calculated by “Paddy Yield Estimation Model” in end of September
Threshold	e.g. XX% of average of yield from the previous 10years
Payout Condition	When index is below threshold
Payout amount	XXX,XXXBaht (e.g. The level of expenses for recovering rice production)

Growth Processes of Paddy/Rice

Planting | **Growing** | **Harvesting**

Correcting data
Earth Observation Satellite Data;
(Precipitation, Land-data, NDVI, etc.)

Deep-learning

Future Estimated Yield (= Index)

When index is below threshold, Compensation is done.

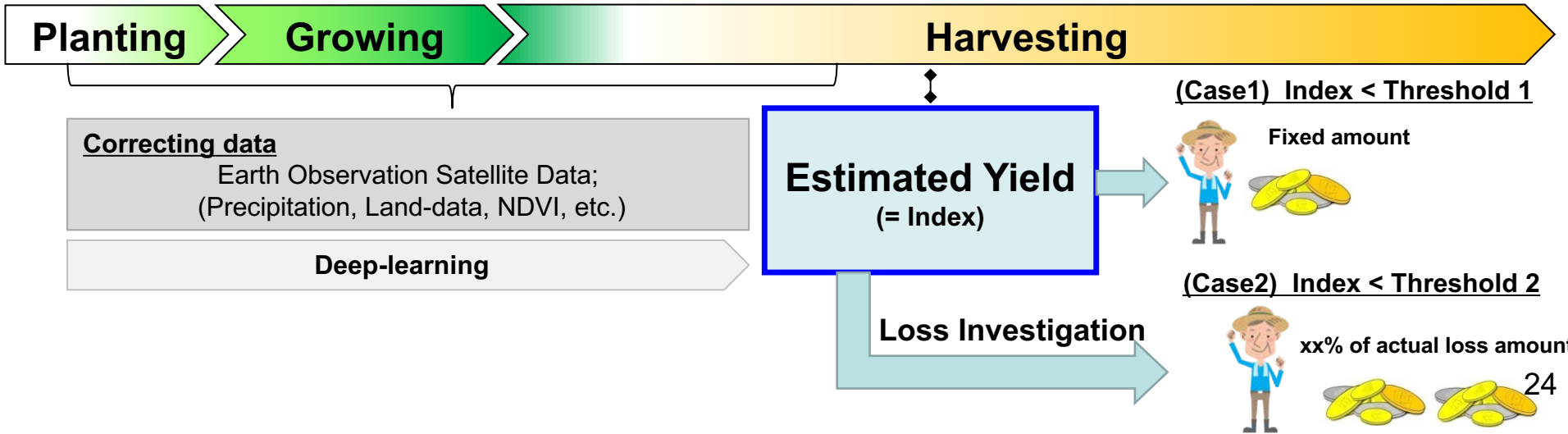
Future Estimated Yield < Threshold

Recovery
***Adding fertilizer**
***Adding agrichemicals**

3) Hybrid-based Insurance

Type of Insurance	Hybrid between “Index-based Insurance” and “Indemnity-based Insurance”
Insurance Period	From planting season to harvesting season
Index	**Estimated Yield** Calculated by “Paddy Yield Estimation Model” in harvesting season
Threshold	**Threshold 1**: 80% of average yield from the previous 10years **Threshold 2**: 50% of average yield from the previous 10years
Payout Condition	**Case1;** In the case “Index” is below “Threshold 1”, **Payout amount** : **Fixed amount XXX,XXXBaht** **Case2:** In the case “Index” is below “Threshold 2”, Insurer conducts loss investigation. **Payout amount: XX% of actual loss amount based on loss investigation**

Growth Processes of Paddy/Rice



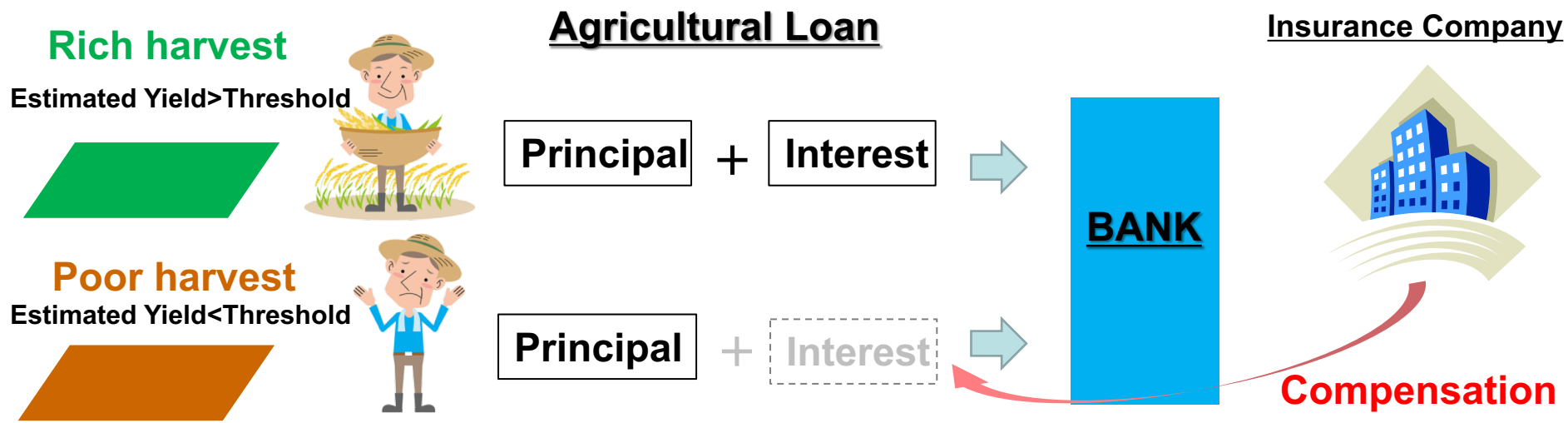
Future Plan

➢ Developing new products and service

- ◆ Agricultural insurance
- ◆ Agricultural loan
- ◆ Agricultural supporting information

Example

Variable interest rate agricultural loan



SOMPO wishes for sustainable agricultural development and rich harvests in developing countries.

Thank you.

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