The Outline of Agricultural Area and Livestock Survey in Japan

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MAFF
Ministry of Agriculture, Forestry and Fisheries

Main Contents

- Agricultural Area Survey
  - Overview
  - Agricultural Land Area Survey and Rice planted Area Survey
- Livestock Survey
  - Overview
  - Specifics of Livestock Survey
- Summary
- Support for Developing Agricultural Statistics in ASEAN

Overview of Agricultural Area Survey

Objective

To clarify the actual conditions of agricultural land and crop planting

Agricultural Land Area Survey

- Area by the type of land (paddy field or upland field)
  [Objective Survey]
- Expanded and abandoned area
  [Field Observation/Information Gathering]

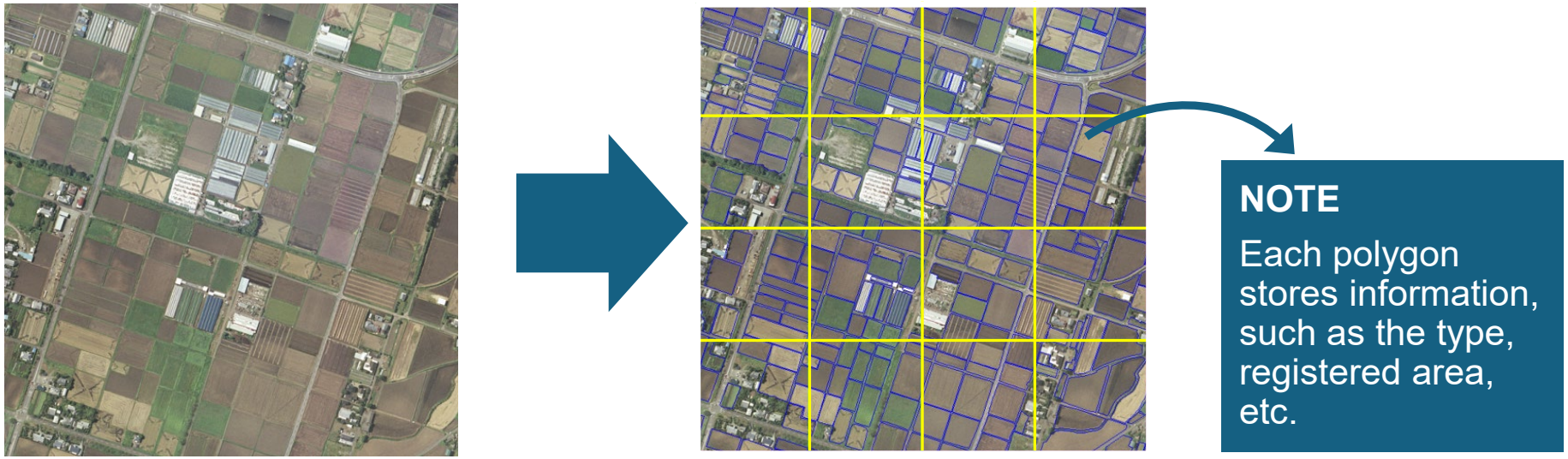
Crop Planted Area Survey

- Rice
  [Objective Survey]
- Other Crops (Wheat, Barley, Sweet potato, Fruits, etc.)
  [Mail/Online Survey]

Outline of Land Area Survey and Rice Planted Area Survey

Survey Population (Area Frame)

- The entire land area of Japan is divided into **grids of 200-meter squares** on satellite images.
- **Survey units** are the grids with agricultural land.
- **Survey population** consists of approx. 2.9 million survey units.
- Agricultural land boundaries are delineated on satellite images to develop **land parcel information (polygon)**.



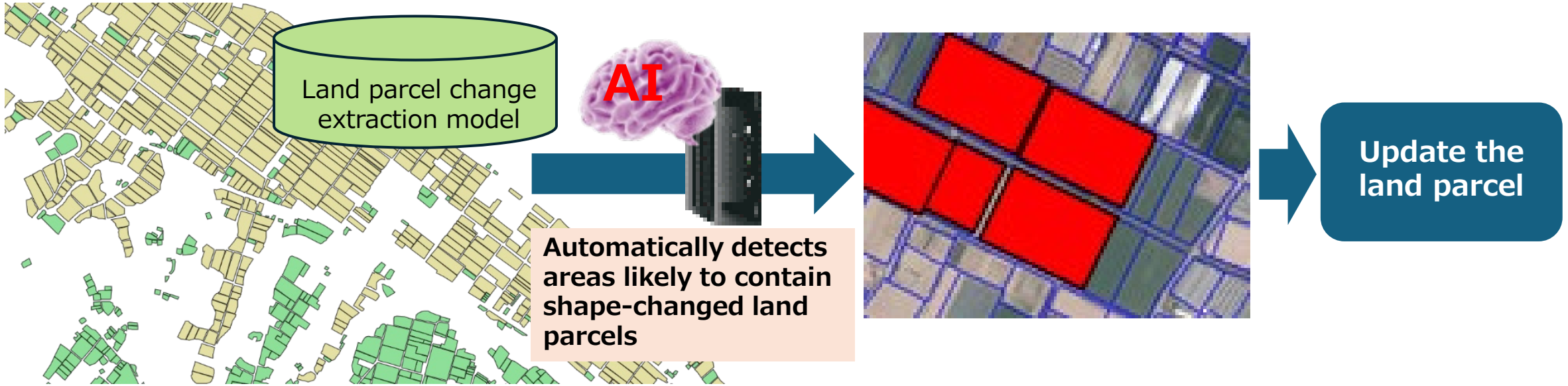
NOTE

Each polygon stores information, such as the type, registered area, etc.

Outline of Land Area Survey and Rice Planted Area Survey

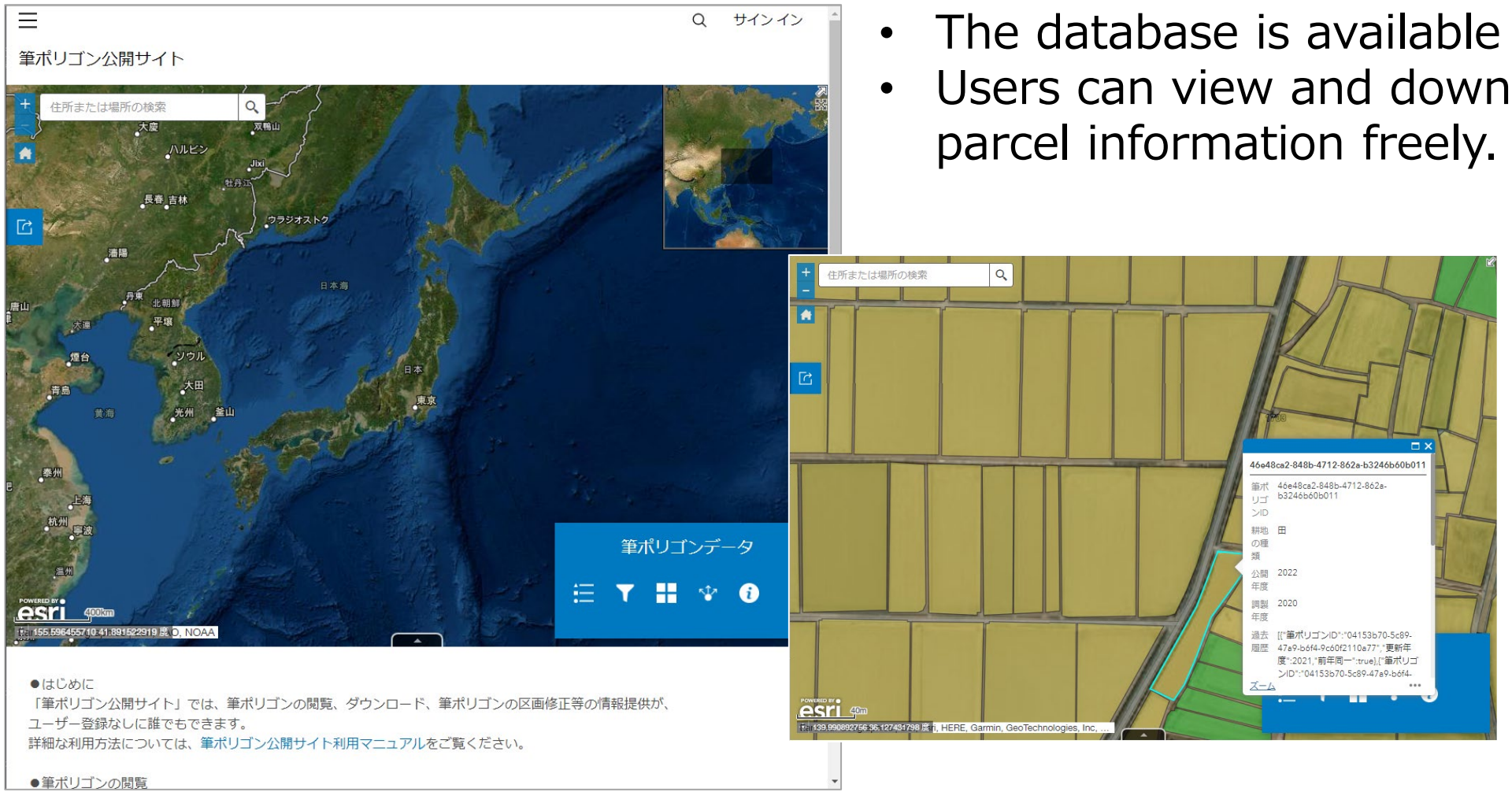
Survey Population Update

- **AI automatically identifies** areas likely to contain shape-changed land parcels by comparing and analyzing satellite image data.



Outline of Land Area Survey and Rice Planted Area Survey

Land Parcel Information Database

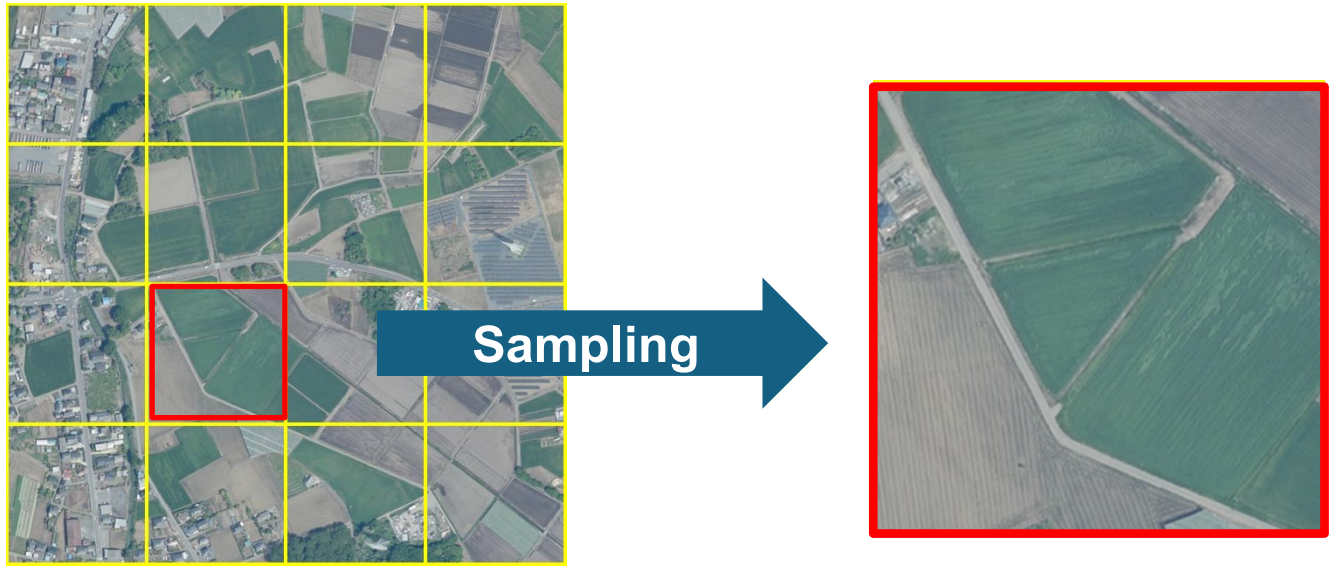


- The database is available online.
- Users can view and download land parcel information freely.

Outline of Land Area Survey and Rice Planted Area Survey

Sampling

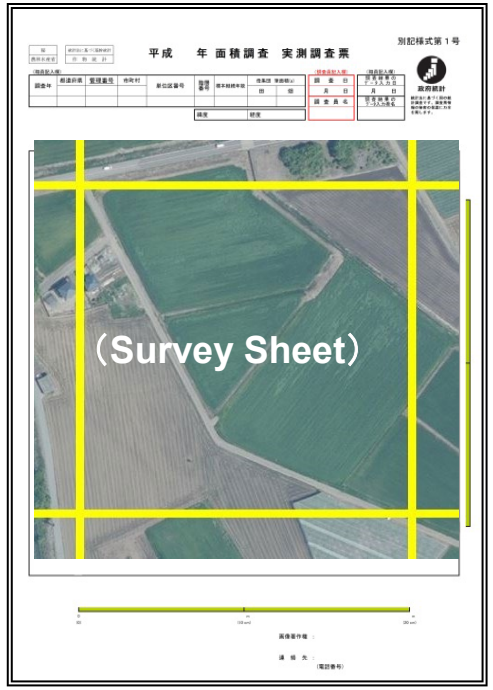
- All survey units are divided into strata based on types and characteristics.
- The number of samples are allocated to each strata.
- **Total approx. 40,000 sample units** are randomly selected nationwide.



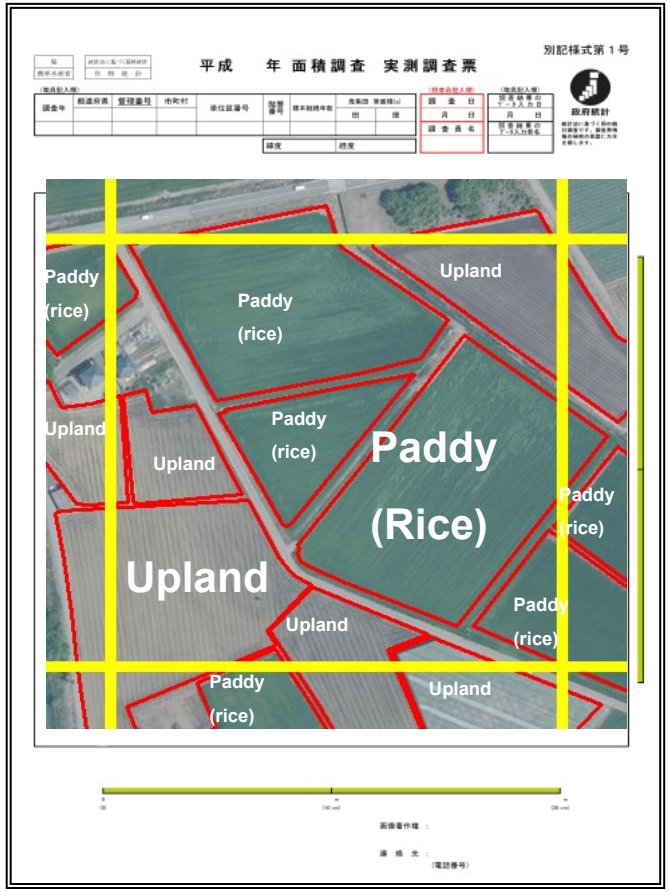
Outline of Land Area Survey and Rice Planted Area Survey

Field Survey

- **Enumerators visit** every sample unit to confirm land boundaries and land use.



Field Survey



Outline of Land Area Survey and Rice Planted Area Survey

Results Estimation

- Agricultural land area (paddy, upland, rice planted area) surveyed in each sample units are accumulated by strata.
- Accumulated area are compared to the registered agricultural land area of sample fields by strata to calculate change rate.
- Estimated area is calculated by multiplying total registered agricultural land area of strata by change rate.
- Estimated area by strata are accumulated to calculate prefectural and national total

$$\text{Estimation} = \frac{\text{Total ag. land area surveyed in sample units of strata}}{\text{Total registered ag. land area of sample units of strata}}}_{\text{Change Rate}} \times \text{Total registered ag. land area of strata}$$

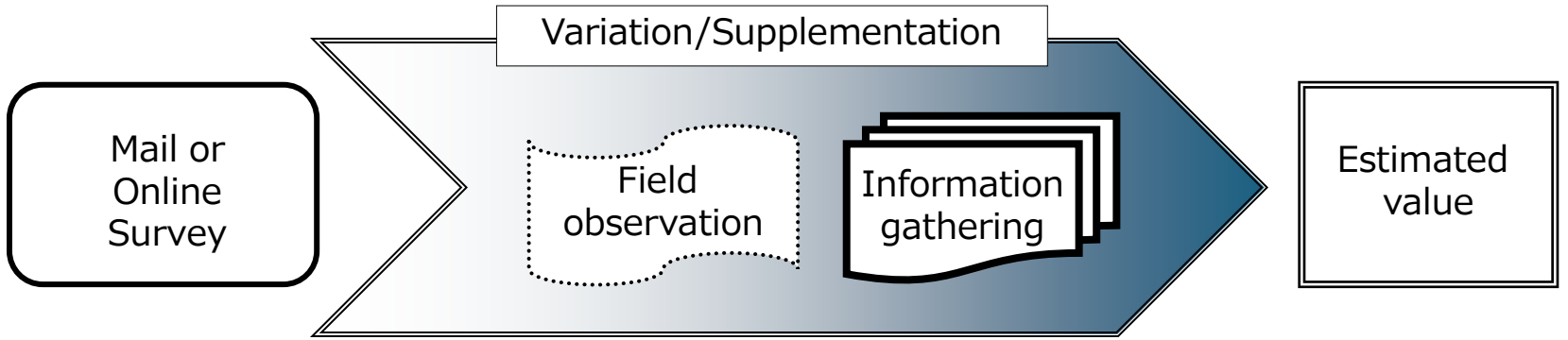
(cf.) Outline of Planted Area Survey (Other crops)

Survey Target

- All the relevant organizations, such as cooperatives that collecting and shipping target crops.

Survey Method

- The survey mode is **mail** or **online**.
- Survey results are supplemented by **field observation** and **information gathering**.



Overview of Livestock Survey

Objective

To estimate the number of **livestock producers** and **livestock**

Livestock Survey

- Pigs, Laying hens, and Broilers [Statistical Survey]
- Dairy cattle and Beef cattle [Administrative Information, etc.]

Outline of Livestock Survey

Statistical Survey for pigs, laying hens, and broilers

Survey Population (List Frame)

- List frame is complied based on the results of the latest **census** and the **livestock survey**.

Survey Target

Pigs	All pig producers
Laying hens	Laying hen producers who raise more than 1,000 birds
Broilers	Broiler producers with annual shipments of more than 3,000 birds

Outline of Livestock Survey

Statistical Survey for pigs, laying hens, and broilers

Sampling

- Target producers are divided into **two strata** by each prefecture. In addition, general strata is further divided by the producer size, etc.

General Strata	Commercial producers
Special Strata	Non-commercial producers, such as school, research laboratories

- In principle, the surveyed producers are **selected randomly**. However, some strata, such as large-scale producer strata, special strata are subject to a full survey

Sample Size

Pigs	2,000
Laying hens	1,200
Broilers	1,000

Outline of Livestock Survey

Statistical Survey for pigs, laying hens, and broilers

Survey Methods

- The survey mode is **mail** or **online**

Estimation Method

- Survey results are estimated by strata as below.
- Estimated values by strata are accumulated to calculate prefectural and national total.

(Estimation by Strata)

	Sample Survey (A)	Full Survey (B)	Total
Number of Producers	Simple Estimation	Results of full survey	(A)+(B)
Number of Livestock	Ratio Estimation		

Outline of Livestock Survey

Estimation for dairy cattle and beef cattle

- MAFF Japan **streamlined the method** of cattle since 2020 to reduce burden on survey respondents.

Past method	Survey to producers similar to other livestock survey.
Current method	Estimation using administrative record and relevant statistical data.

- Number of the cattle producers and cattle are calculated using following information.

  - **Database on Individual Identification Information of Cattle**
  - Test results of breeding organization, such as dairy cow performance
  - Census on Agriculture and Forestry
  - Crop survey (feed crop planted area)
  - Historical data of livestock survey

Summary

MAFF Japan adopts various means of data collection, under given conditions, such as user needs and budget.

(Survey)

Type of surveys	Type of survey method
Sample surveys, Census	objective, mail, online, interview

(Other sources)

Administrative information, satellite information, field visit, data gathering.

(Advanced technologies)

AI, GIS, etc.

Providing reliable data sustainably

Support for Developing Agricultural Statistics in ASEAN

ASEAN **F**ood
Security
Information
System

- Ensure food security
- Maintain, compile, and provide accurate food security information and agricultural statistics

Support for Developing Agricultural Statistics in ASEAN

Background and Mechanism

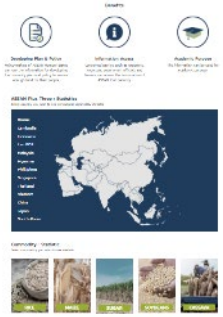
- Established at the 1st Meeting of AMAF Plus Three
- Operated with contribution and Experts from MAFF, Japan
- In-kind contribution by MOAC, Thailand

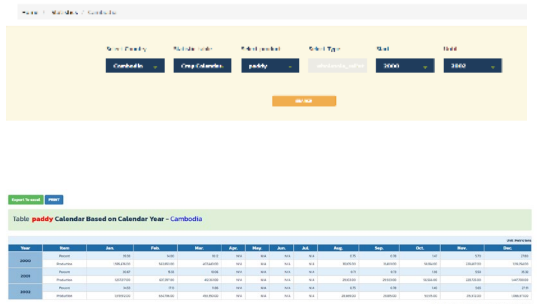
Support for Developing Agricultural Statistics in ASEAN

Fundamental Activities of AFSIS

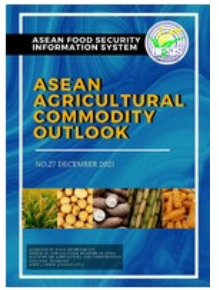
- Target Crops

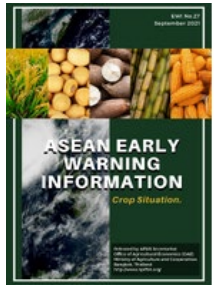
- Database on Agricultural Statistics





- Agricultural Commodity Outlook
  Early Warning Information Rice Growing Outlook





Support for Developing Agricultural Statistics in ASEAN

AFSIS-JAXA Cooperation on Rice Area Estimating Tool using Satellite Information

JAXA (Japan Aerospace Exploration Agency) developed the Rice area estimating software **"INAHOR"** using ALOS-2 satellite data.

JAXA estimated the rice planting area in **Cambodia, Lao PDR, and Vietnam** by INAHOR to be a feasibility study.

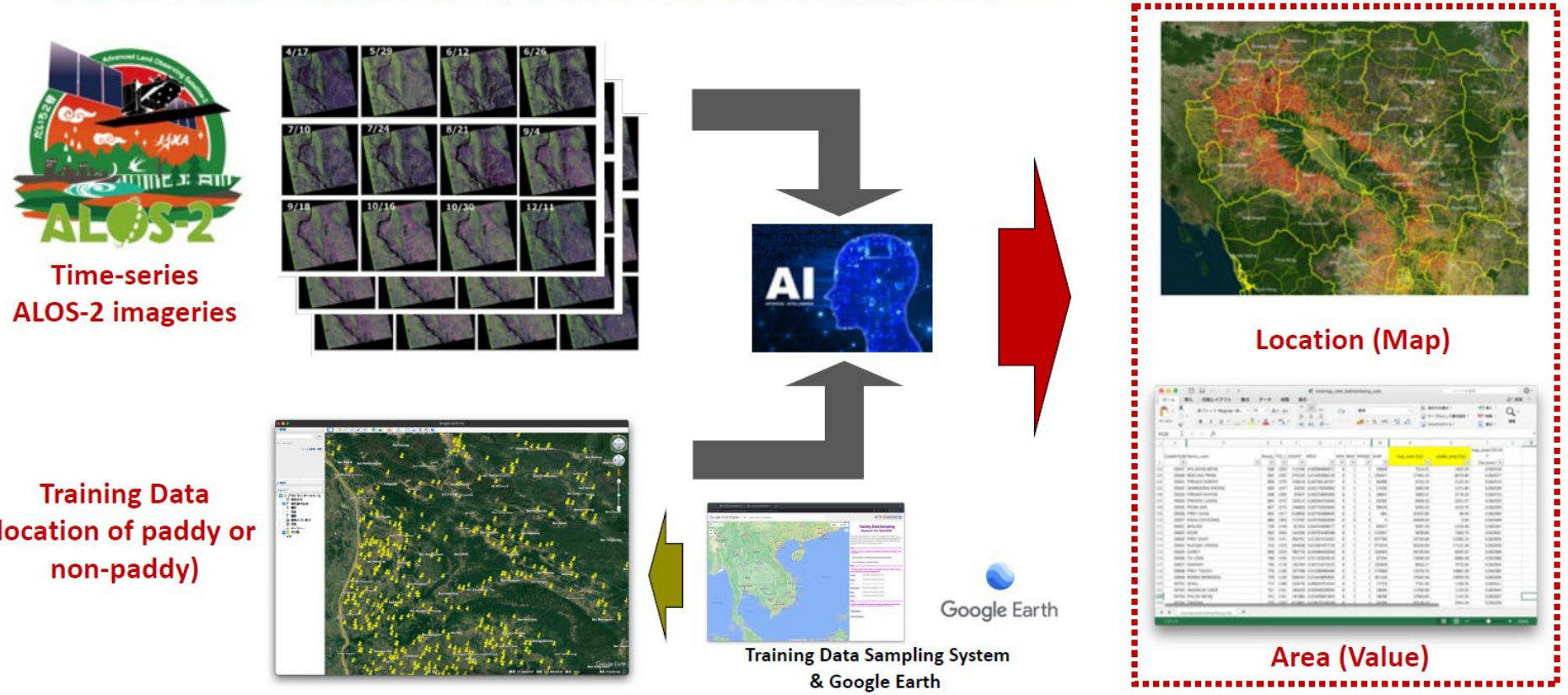
AFSIS/MAFF Japan and JAXA collaborate to distribute experiences of rice area estimation by INAHOR in ASEAN countries and to publish data and map produced INAHOR on the AFSIS website

ALOS-2
(Advanced Land Observing Satellite-2)

Support for Developing Agricultural Statistics in ASEAN

AFSIS-JAXA Cooperation on Rice Mapping Tool using Satellite Information

- Rice planted areas are identified by **time-series ALOS-2 data with AI (Artificial Intelligence) technology** classification model is automatically developed based on training data.
- **Accurate and adequate training data are therefore very important** to create accurate rice map.



THANK YOU