Summary of Report of Committee on the Management of Cropland Information Utilizing "Digital Map" (1)

Chapter 1 Introduction

- Cropland information is individually collected and managed. As a result, farmers and implementing bodies suffer from **a substantial amount of workload on cropland information management and on-site surveys**. In some cases, information is inconsistent.

- Meanwhile, **digital technology such as satellite images is rapidly advancing**, and a **technological environment is being established**. The Committee discussed **how to centrally manage and effectively use cropland information** to **reduce burdens** on farmers and implementing bodies and to **ensure accuracy and consistency of cropland information**, which was summarized in a report.

Chapter 2 Current Situation and Analysis

- In **"procedures related to transfer of cropland rights," "procedures related to business income stabilization measures," and "procedures related to agricultural insurance,"** cropland information is managed according to the purpose and aim of each institution. However,

  [1] when making an application, farmers are required to **notify implementing bodies of cropland information in paper form every time;**

  [2] staff of implementing bodies manually inputs handwritten information into databases; cropland information is collected and accumulated in a vertically divided manner, and data matching is not performed adequately; as a result, in some cases, **cropland information is inconsistent**;

  [3] information collected by implementing bodies is not linked to map information, which is placing **a large workload on on-site verification and preparation of maps necessary therefor.**

- Some systems (e.g., Agricultural Land Information System Agricultural Committee, Midori Information System) are currently available for the management of cropland information, but they assume certain ways of use. As a result, information on these systems may differ from the actual cropland information, and only the information for the region may be registered in the systems.

- Municipalities use their own systems depending on the institution, resulting in **a large number of systems existing**. It is difficult to determine which is the latest data.

Chapter 3 Elemental Technology

Some elemental technologies are available, including:

- **Fude Polygon (cropland lot information)** for 30 million lots in Japan;
- **geospatial information-related technology** such as artificial satellite images;
- **database-related technology** (e.g., cloud-based systems) and **identity provider (IdP)** that enables viewing and editing depending on the privilege; and,
- **MAFF Common Application Service (eMAFF)** which enables applicants to easily make applications any time using their own PCs, smartphones, etc.

Summary of Report of Committee on the Management of Cropland Information Utilizing "Digital Map" (2)

Chapter 4 Future Direction of Cropland Information Management

- Cropland information is to be centrally managed using maps linked to cropland information collected by implementing bodies through **eMAFF**, while **utilizing various digital technologies**, based on the **fude polygons** (hereinafter referred to as the "**Digital Map**"). By this,

  [1] all applications will be made online, only one platform will be required (**one-stop**), already input information can be reused (**once-only**), and intuitive operations looking at a map on screen improves the convenience for farmers, etc.;

  [2] centralized management of cropland information using the Digital Map will **make it easy to keep the information up to date and consistent across databases**; and,

  [3] **management operations by implementing bodies will be substantially rationalized** by, for example, efficiently performing on-site verifications using the Digital Map displayed on a tablet.

- In the future, the Digital Map may be utilized in [1] **automatic driving, satellite positioning system, drones**, [2] **on-site verification and damage situation understanding using satellite images, etc.**, and [3] **farmer and cropland planning** and **accurate understanding of the situations related to land improvement programs**.

Chapter 5 System Requirements of Digital Map

- In the system construction and operation, it is important to **ensure the accessibility, inter-operability, reliability, sustainability, scalability, flexibility, and security and availability**.
- The **system implementation policies** are, [1] building, operating and managing the cropland GIS "**Digital Map**" in **eMAFF**, [2] **linking various kinds of cropland information** based on **fude polygons**, and consolidating cropland information, [3] a **hybrid system** using LGWAN and Internet networks, [4] **Single Sign-On** by **IdP**, privilege-based viewing and editing, **ensuring security** that does not rely on network isolation, [5] **data management and update** by **various entities**.

Chapter 6 Future Initiatives

- **Surveys on actual situations** are required for **providing fude polygons with address information**, **linking fude polygons with various ledgers**, **designing cropland-related database and ID systems**, and **standardization of cropland-related data**.
- **Remodeling and improving the systems to link geographic information systems with application data** on eMAFF will be systematically conducted, measures about individual systems of implementing bodies will be implemented, and **Proof of Concept (PoC) toward effective utilization of centralized management of cropland information** will be conducted.
- In so doing, attention to the handling of personal information, considerations on anonymization and concealment, properly addressing elderly persons who are unable to make applications online, and considerations on the evaluation and improvement of the quality of data will be required.

Current Situation and Problems of Cropland Information Management

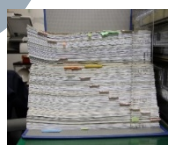
Individually submit using paper

Content
- Cropland location
- Cropland area
- Owner
- Farmer, etc.

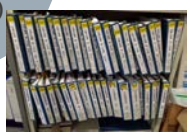
Farmers

Example management of cropland information (1 year)
(Regional council for regeneration of agriculture)

Agricultural committee Secretariat (~1,700)



Regional council for regeneration of agriculture (e.g., agricultural cooperative) (~1,600)



Agricultural insurance association (~110)

Data input from handwritten info

Data input from handwritten info

Data input from handwritten info

○ Updating cropland info **2,136** hours and **57,300** sheets of documents per year (Hanamaki, Iwate; Business income stabilization measures)

Own DB
Cropland rights related

Own DB
Business income stabilization measures

Own DB
Income insurance
Agricultural insurance

○ Preparation of paper map info **40 hours** of work (Atsugi, Kanagawa; Cropland usage survey)

Work to link cropland info to map

Work to link cropland info to map

Work to link cropland info to map

Map info

Map info

Map info

A paper map marked with a highlighter pen

On-site survey

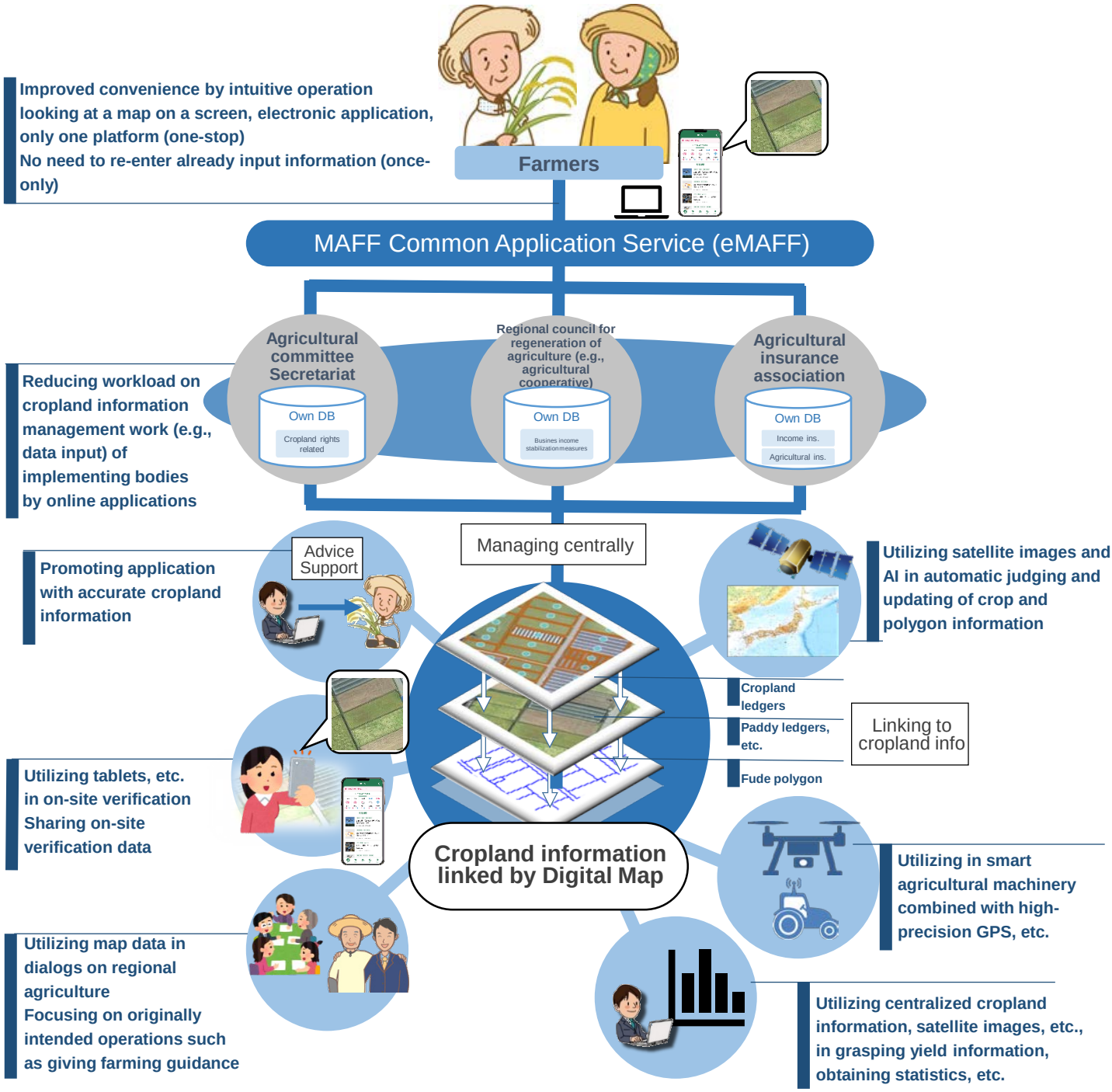
On-site survey

On-site survey

○ Shiroishi, Saga: Approx. **23,000** lots On-site verifications **2-3** times a year (Business income stabilization measures)

○ Gunma Pref Agricultural Insurance Association Actual measurement surveys for approx. **40,000 lots** (2010) (Agricultural insurance)

Direction of Use of Digital Map in Cropland Information Management and Utilization



Estimated reduction in workload*

o Data input time and the number of paper related to updating cropland information will become **zero in principle**.

However, for persons (e.g., elderly persons) who have difficulty with making online applications, accepting applications by conventional method using paper forms and giving assistance such as proxy application will be required.

o By utilizing tablets in on-site surveys,

[1] Paper map preparation time and data re-input time after returning to the office become **zero**; and,

[2] Guiding to the site, inputting survey results, etc., will become more efficient, and workload is expected to be reduced by **around 60%** (estimated from actual cases).

* Estimated from interviews to Committee members and released materials