Support for Statistical Data Analysis in the Ministry of Agriculture, Forestry and Fisheries
- Propelling the Agriculture, Forestry and Fisheries with the Power of Data -

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SAFF
データの力で。
農林水産統計
Statistics of Agriculture, Forestry and Fisheries

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1. Mission of the Statistics Department of the MAFF and Its Support for Statistical Data Analysis

Regarding the Statistics Department of the MAFF

○ **The Statistics Department of the MAFF** (hereinafter referred to as the "Statistics Department") is an organization **responsible for the crucial role of compiling and publishing the Statistics of Agriculture, Forestry, and Fisheries (SAFF),** which provide insights into the realities of Japan's food, agriculture, forestry, and fisheries.

○ **The SAFF serve as an essential information infrastructure and public asset that supports administration of agriculture, forestry, and fisheries.** They are indispensable for planning and formulating various policies of the MAFF, as well as for evaluating KPIs and other metrics.

O Roles of the SAFF

Promotion of Agricultural Policy

To implement more effective policies, it is essential to have data that accurately captures the circumstances surrounding the agriculture, forestry, and fisheries.

The Statistics Department conducts necessary surveys for:

1. **Evidence for national fiscal expenditure**
2. **Criteria for program implementation such as demand stabilization**
3. **Setting and evaluating policy goals**

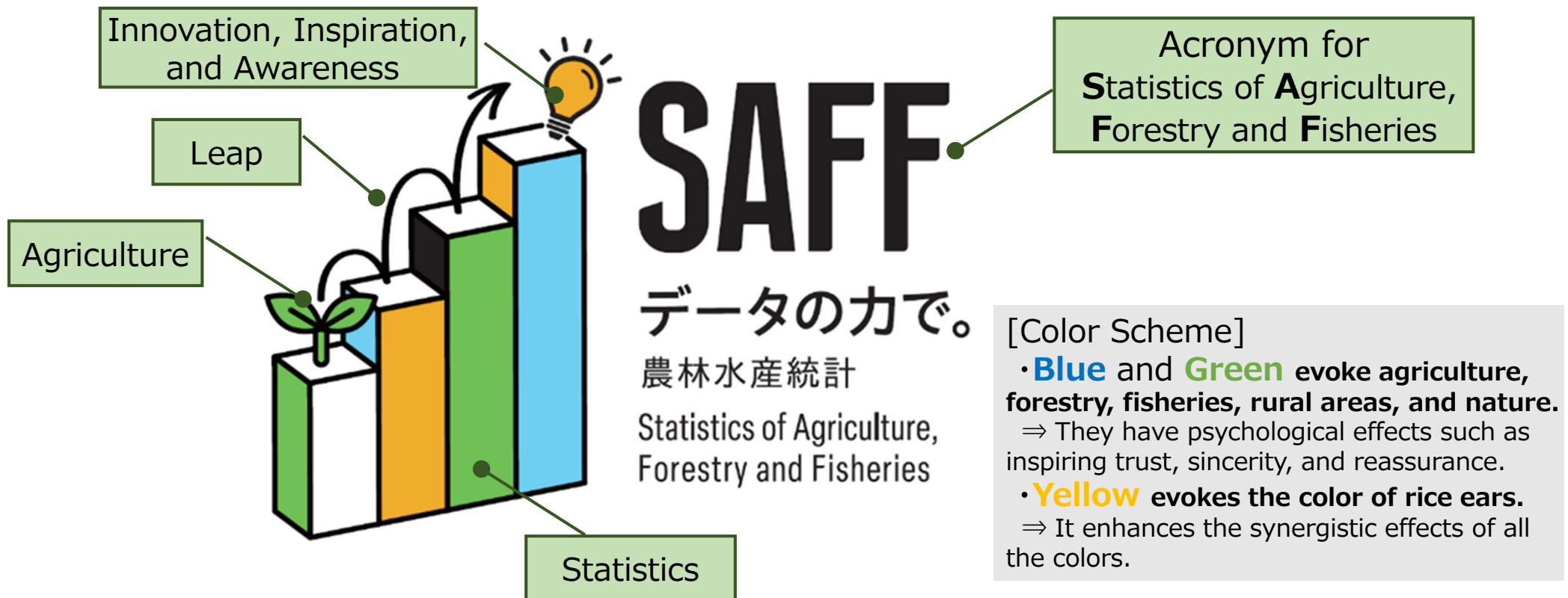### Academic Research and Education

The published survey results serve as a "measure" for understanding the conditions surrounding Japan's agriculture, forestry, and fisheries.

The statistics created by the Statistics Department are widely utilized as:

1. **Indicators for the public to understand agriculture, forestry, and fisheries**
2. **Academic research data**

Mission of the Statistics Department as Embodied in Its Logo

○ In March 2024, the **Statistics Department established its "logo."**
○ The logo embodies the desire to **"propel the agriculture, forestry, and fisheries with the power of data"** through its overall design.

Innovation, Inspiration, and Awareness

Leap

Agriculture

Acronym for **S**tatistics of **A**griculture, **F**orestry and **F**isheries

SAFF

データの力で。

農林水産統計

Statistics of Agriculture, Forestry and Fisheries

Statistics

[Color Scheme]
・**Blue** and **Green** evoke agriculture, forestry, fisheries, rural areas, and nature.
 ⇒ They have psychological effects such as inspiring trust, sincerity, and reassurance.
・**Yellow** evokes the color of rice ears.
 ⇒ It enhances the synergistic effects of all the colors.

Promotion of the Analysis and Utilization of the SAFF to Support EBPM

○ As the **demand for EBPM (Evidence-Based Policy Making)** increases year by year, **the need for and importance of strengthening EBPM efforts** have been described in documents endorsed by the Cabinet.

○ **The revised Basic Plan for Food, Agriculture, and Rural Areas** also urges **the implementation of analysis and utilization of SAFF data**. The Statistics Department needs to further engage in **promoting policy-making support based on data**.

Basic Plan for Food, Agriculture, and Rural Areas
(Cabinet decision on April 11, 2025) (excerpt)

Chapter 5: Necessary Measures for the Comprehensive and Systematic Promotion of Policies Related to Food, Agriculture, and Rural Areas

2. Promotion of the Sustainable Collection and Utilization of Statistical Data
 The Statistics of Agriculture, Forestry, and Fisheries (SAFF) are essential information infrastructure and public asset that supports the planning and formulation of policies based on the Basic Plan and the evaluation of KPIs among other things.
[...] In response to new policy needs, **analyses utilizing statistical data, including the SAFF, should be conducted with strengthened collaboration between statistical and policy departments**.

Basic Policy on Economic and Fiscal Management and Reform 2025
(Cabinet decision on June 13, 2025) (excerpt)

Chapter 3: Realizing a Sustainable Economy and Society over the Medium and Long Term

3. Strengthening efforts to promote plans
[...] In implementing the Economic and Fiscal Plan for New Stage, it is essential to maximize policy outcomes with limited resources. To this end, relevant ministries and agencies will **fully advance EBPM across the government** in accordance with the EBPM Action Plan. At the end of each year, we will review and reinforce the plan, and **reflect the results in the Basic Policy for the following fiscal year and beyond, thereby further strengthening EBPM.**

Master Plan Concerning the Development of Official Statistics
(Cabinet decision on June 13, 2025) (excerpt)

III. Development of the Infrastructure for Production, Provision, and Use of Official Statistics

(3) Promotion of EBPM and utilization of statistics
 Statistics demonstrate their true value only when they are used effectively, and each ministry should not only focus on producing statistics but also on promoting their utilization.
[...] In recent years, it has become important to accurately utilize official statistics for EBPM, which has been advocated as necessary for policy making and evaluation in government agencies and local governments. **The promotion of EBPM and the development and improvement of official statistics are like two wheels on a cart, so to speak, supporting each other.**

Supporting the Promotion of EBPM through the facilitation of the Utilization and Analysis of SAFF Data

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Analysis Support by the Statistical Data Analysis Support Team

○ In 2022, the Statistics Department established a cross-departmental **Statistical Data Analysis Support Team**.

○ **In collaboration with various policy departments** within the ministry, the team **conducts multifaceted analyses** by combining statistical data, survey data, and various operational data to support the planning and formulation of policies.

Analytical Methods

- **Visualization and testing through cross-tabulation**
- **Visualization using map information** (*1)
- **Typification through cluster analysis**
- **Predictive analysis using regression analysis, decision trees, etc.**
- **Impact verification methods such as difference-in-differences analysis and propensity score matching**
- **Text mining**

etc.
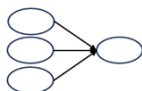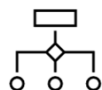
Conducting analyses by combining data owned and provided by the Statistics Department with administrative data from various policy departments within the ministry
(Collecting additional data as needed through awareness and intention surveys (*2) or by purchasing big data)

Visualization of respondent characteristics by attribute through cross-tabulation combining awareness and intention surveys with the Agriculture and Forestry Census
(also conducting typification through cluster analysis)

Quantitative impact verification of policy goals (outcomes) using difference-in-differences analysis and propensity score matching

Utilizing "Ikasu DB" for small-area analysis by combining the Agriculture and Forestry Census, Population Census, administrative data, etc.

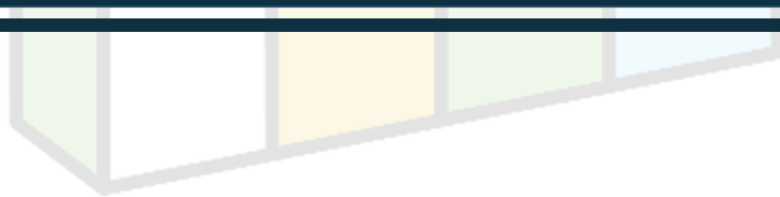*1 Data featured in the Regional Agriculture Observation, Knowledge, and Utilization Database ("Ikasu DB")

*2 Questionnaire surveys conducted by the Statistics Department based on requests from policy departments

2. Introduction of Analysis Report: Effect Analysis of Agricultural Heritage Designation

What is Agricultural Heritage?

○ **The Globally Important Agricultural Heritage Systems (GIAHS) and Japanese Nationally Important Agricultural Heritage Systems** (hereinafter referred to as "Agricultural Heritage") are programs **that designate important agricultural, forestry, and fisheries. These systems are characterized by their unique traditional agriculture, forestry, and fisheries that have been passed down through generations** while adapting to societal and environmental changes. They also encompass closely related cultural heritage and agricultural biodiversity that should be preserved for future generations.

○ Initiatives in regions designated as Agricultural Heritage significantly contribute to achieving the Sustainable Development Goals (SDGs) proposed by the United Nations.

Sado City, Niigata Prefecture: **"Sado's Satoyama in Harmony with the Crested Ibis" (designated in 2011)**

Noto Region, Ishikawa Prefecture: **"Noto's Satoyama and Satoumi" (designated in 2011)**

GIAHS Utilization Executive Committee

Overview of the Analysis

◎ Purpose of the Analysis

○ **Awareness of the agricultural heritage system remains limited** in Japan. To improve this situation, it is necessary to **effectively communicate the effects of agricultural heritage designation** using concrete data and to conduct effective public relations.

○ This analysis aims to **clarify the effects of agricultural heritage designation in terms of economic impact and changes in the recognition and evaluation of agricultural heritage (regions)**. It will serve as foundational material for further consideration of efforts to enhance recognition of agricultural heritage in the future.

◎ Data

- Agriculture and Forestry Census (2010, 2015, 2020)
- Estimated agricultural output by municipality (2014–2022)
- Economic Census (2012, 2016, 2021)
- Number of tourists (2013–2020)
- Basic aggregation of employment status from the Population Census (employed population) (2010, 2015, 2020)
- Population, Demographics, and Household Survey based on the Basic Resident Register (population and number of households) (2010–2023)
- Number of rural-stay (*) guests and number of accommodations (2014–2022) (provided by the Rural Development Bureau)
- Data extracted from X (formerly Twitter) posts (2015–2017)

（*）Tourism where guests stay in rural areas and enjoy meals and experiences utilizing local resources

Overview of the Analysis

◎**Contents of the Conducted Analysis**

i. Distribution of Regions Designated as Agricultural Heritage

ii. Typification through Cluster Analysis

iii. Effect Verification ① Economic (Agriculture and Forestry) Effects

iv. **Effect Verification ② Economic (Tourism) Effects** [Propensity score matching & difference-in-differences testing]

v. **Effect Verification ③ Changes in Recognition and Evaluation of Agricultural Heritage (Regions)** [Text analysis (co-occurrence, frequently occurring words, word clouds, etc.)]

(Reference) The analysis report is available at
https://www.maff.go.jp/j/tokei/bunseki/index.html
*Available only in Japanese

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Verification of Economic (Tourism) Effects

○ Various tourism **indicators related to the number of rural-stay guests** in designated regions were **visualized on a map**, and **differences in growth rates before and after designation were compared**.
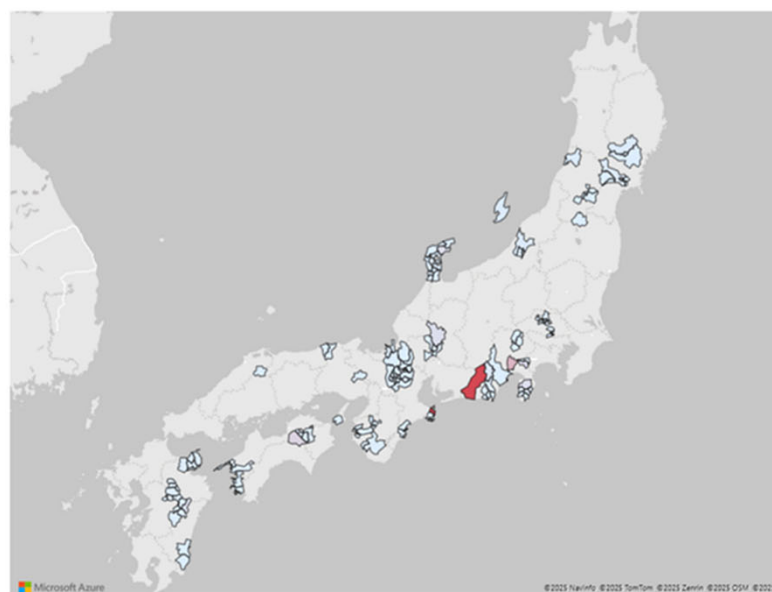
○ Data by municipality from 2017 to 2022
*These are not data available for all municipalities from 2013 onward, but rather the totals of existing data.
*The mapping characteristics for each year are similar to those of the previous year's total mapping.

○ Number of rural-stay guests from high to low: **Displayed in dark red to light blue**

Toba City, Mie Prefecture
Hamamatsu City, Shizuoka Prefecture

Fujinomiya City, Shizuoka Prefecture

Gujo City, Gifu Prefecture
Noto Town, Ishikawa Prefecture
Miyoshi Town, Saitama Prefecture
Miyoshi City, Tokushima Prefecture
 and others

Other municipalities

○ **When comparing the number of rural-stay guests by region from 2017 to 2022**, the maximum was 2.8 million in the wasabi-cultivating region of Shizuoka Prefecture, and the minimum was 567 in the Nanyo region of Ehime Prefecture, showing a large regional disparity. **Eighteen out of 28 regions had fewer than 60,000 guests, indicating overall low levels**.
(The national municipal average is 60,000.)

○ Regarding the growth rate of the number of rural-stay guests, <u>**designated regions had higher growth rates than non-designated ones in every year of designation. It was confirmed that, particularly in the regions designated in 2017 and 2019, this difference was statistically significant.**</u>

Period	Indicator	Year of designation	Effect (*)	Growth rates		P-value
				Designated regions	Non-designated regions	
From 2017 to 2022	Number of rural-stay guests	2017	◎	0.69	-1.15	0.01
		2019	◎	1.13	0.05	0.09
		2021	○	1.02	0.08	-

* ○: indicates that the growth rate in designated regions is higher than that in non-designated regions;
◎: indicates that the growth rate is significantly higher, with a statistical significance level of 10%.

Changes in Recognition and Evaluation of Agricultural Heritage (Regions)

○ To understand the changes in recognition and evaluation brought about by the designation of agricultural heritage, **we analyzed the posting status of keywords related to a designated region on social media before and after its designation, as well as changes in co-occurring words**.

○ For **posts that include the keywords "fallen leaf compost,"** related to the **"Fallen Leaf Compost Agroforestry System in Musashino Upland" in the Musashino area of Saitama Prefecture** (designated in 2023), we examined **monthly posting trends**, **word clouds** for different periods, and **frequently occurring words**.

Fallen Leaf Compost Agroforestry System in Musashino Upland, in the Peri-Urban Area of Tokyo, Japan

·Since the Edo period (1600s), planting trees and cultivating flatland forests on barren volcanic ash soil and using fallen leaves as compost to improve the soil has allowed stable production to be achieved.

·This land use of flatland forests with historical value has been passed down to the present, continuing sustainable agriculture utilizing fallen leaf compost and preserving a distinctive agricultural landscape.

·Additionally, the managed flatland forests serve as breeding grounds for goshawks and provide a favorable growth environment for rare plants such as noble and golden orchids.

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◯ An increase in the number of posts containing "fallen leaf compost" was observed around the month of designation.

◯ During the period before designation (Period ①), there were many posts in the context of developing effective compost, co-occurring with terms such as "fermentation" and "homemade."
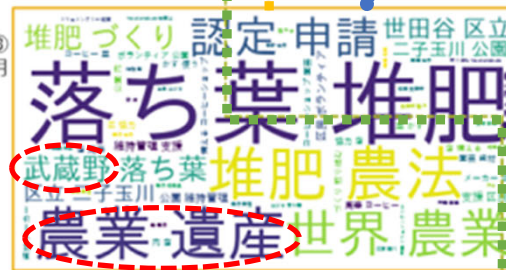
◯ In the period just before designation (Period ③), posts mentioning agricultural heritage, names of regions, and media reports appeared.
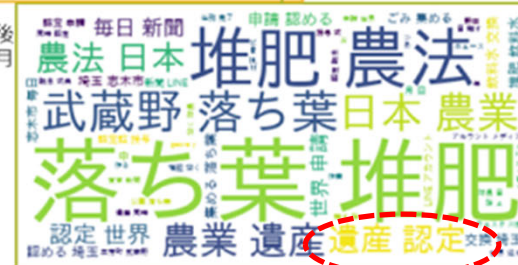
◯ After designation, an increase in posts related to the region being designated as agricultural heritage was observed.

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3. Introduction of the MAFF Statistical Dashboard
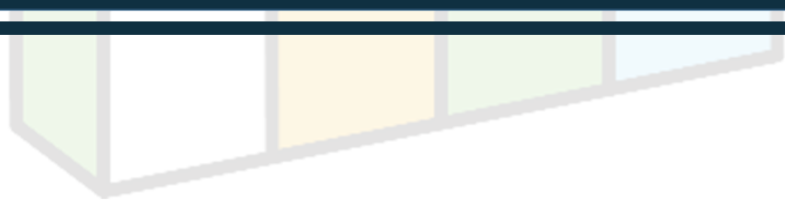
MAFF Statistical Dashboard

○　In addition to traditional published materials and statistical tables, **we actively provide more visual and easily understandable information by utilizing Business Intelligence (BI) tools** to "visualize data," aimed at users both inside and outside the ministry.

Traditional Published Materials and Statistical Tables

While the overall published results are easy to overview, they do not allow for interactive data visualization, such as displaying only the desired data or selecting specific data.

Data is displayed according to the user's selection, enabling dynamic and immediate grasp of data by prefecture or over multiple years.
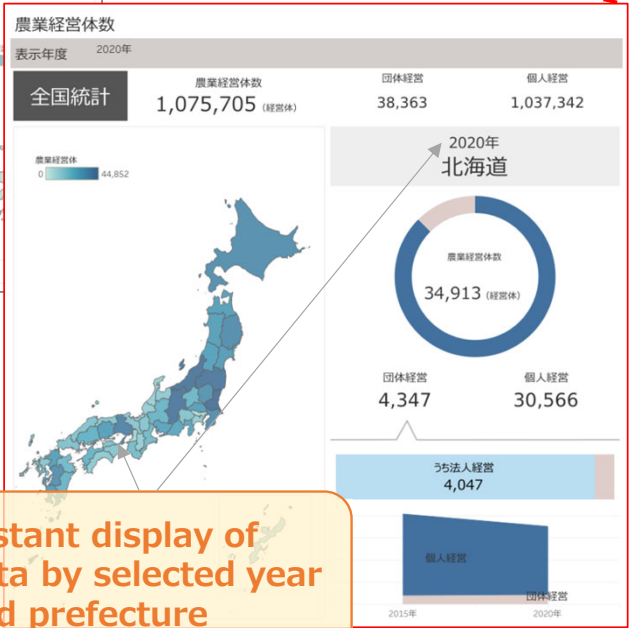
Users can navigate to pages corresponding to selected items to view more detailed information.

Instant display of data by selected year and prefecture

4. Future Directions

Wrap-Up: Future Directions for Data Analysis Support

Strengthening Collaboration with Related Departments within the Ministry	From the perspective of **contributing to the steady promotion of the revised Basic Plan for Food, Agriculture, and Rural Areas, we will strengthen collaboration with all relevant divisions and departments within the ministry. We will also select analysis themes** that support policy formulation and evaluation, and further advance data analysis support.
Intensification of Analysis Activities by Local Organizations	**By actively promoting data analysis that reflects the realities on the ground among local organizations of the ministry, we aim to create a virtuous cycle** where not only local policy departments but also **local governments and stakeholders in agriculture, forestry, and fisheries highly value analyses and increasingly request and consult regarding them.**
Enhancing the Environment for Advanced Data Utilization	To enable advanced data utilization without dedicating excessive efforts to preparing data for analysis, **we will consider the appropriate forms of statistical data utilization environments, including means of preparing data for analysis.**
Training of Data-Utilizing Personnel	To promote the acquisition of knowledge and skills necessary for data analysis and the use of digital tools, **various training programs such as "Data Scientist Development Training" will be implemented to cultivate personnel who can contribute to policy formulation and implementation based on data.**

Contributing to propelling the agriculture, forestry, and fisheries with the power of data!

Thank you for your attention!