

Visualization of Environmental Burden Reduction Efforts in Japan



GHG Reduction



GHG Reduction
&
Biodiversity Conservation

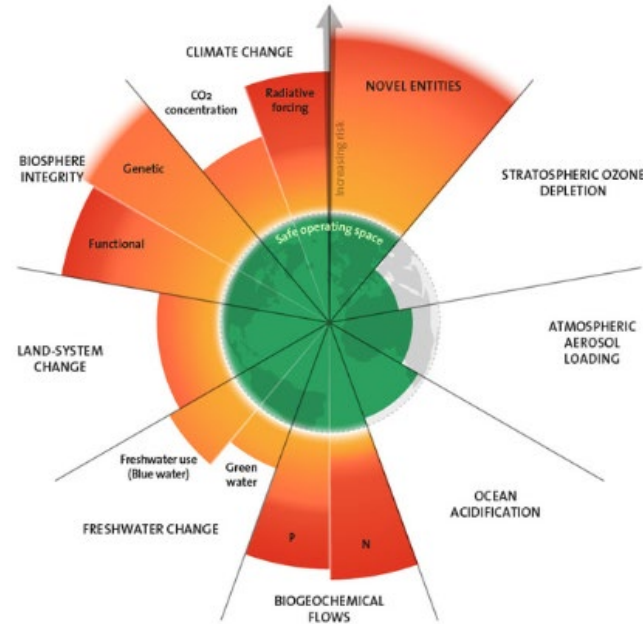


August 2024

Ministry of Agriculture, Forestry and Fisheries of JAPAN

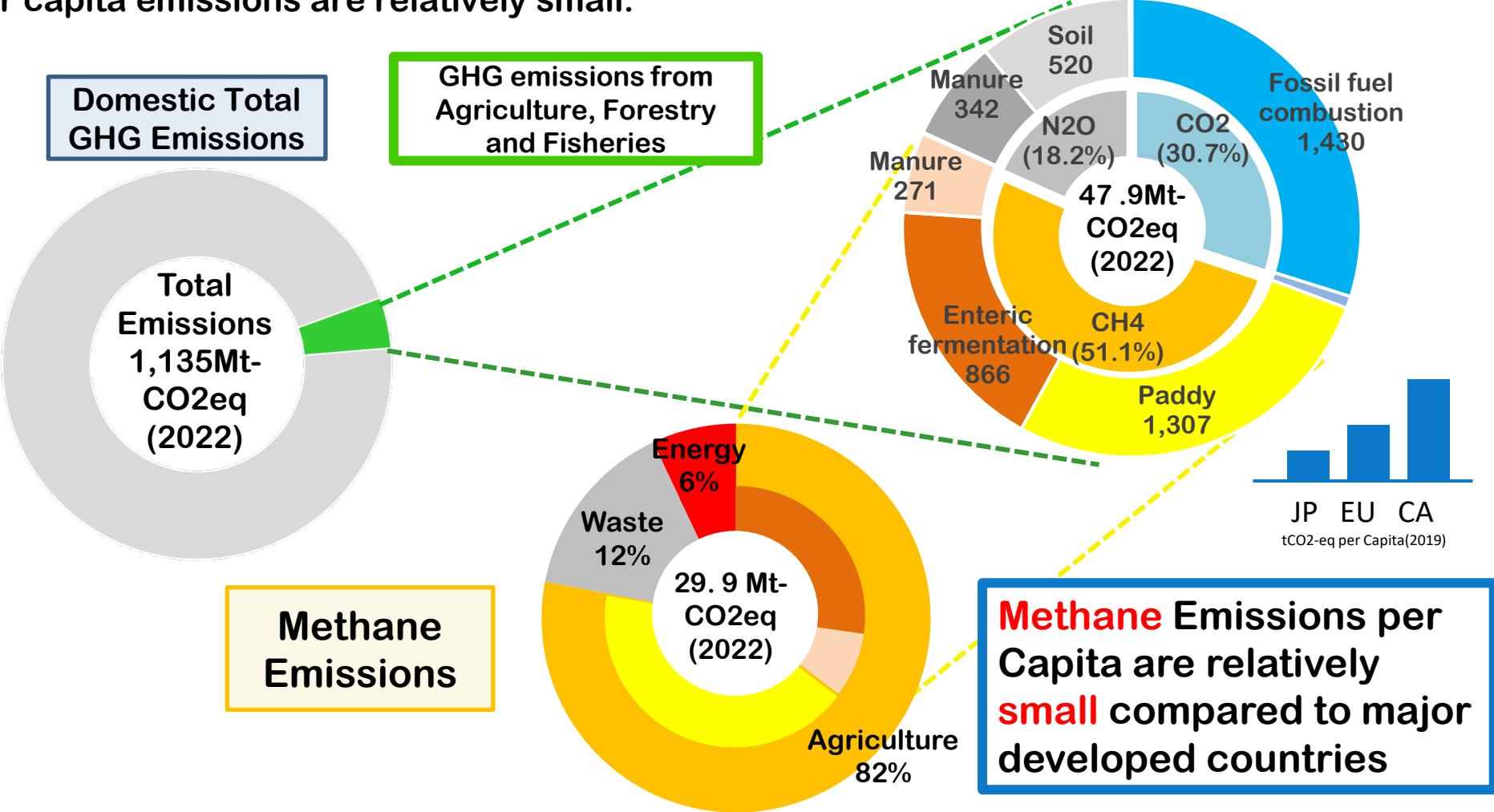
Facing many Challenges

- Depopulation and aging of producers
- Stagnant rural communities
- Climate change and increasing natural disasters
- Disrupted supply chains due to the COVID-19
- Other challenges to achieve SDGs

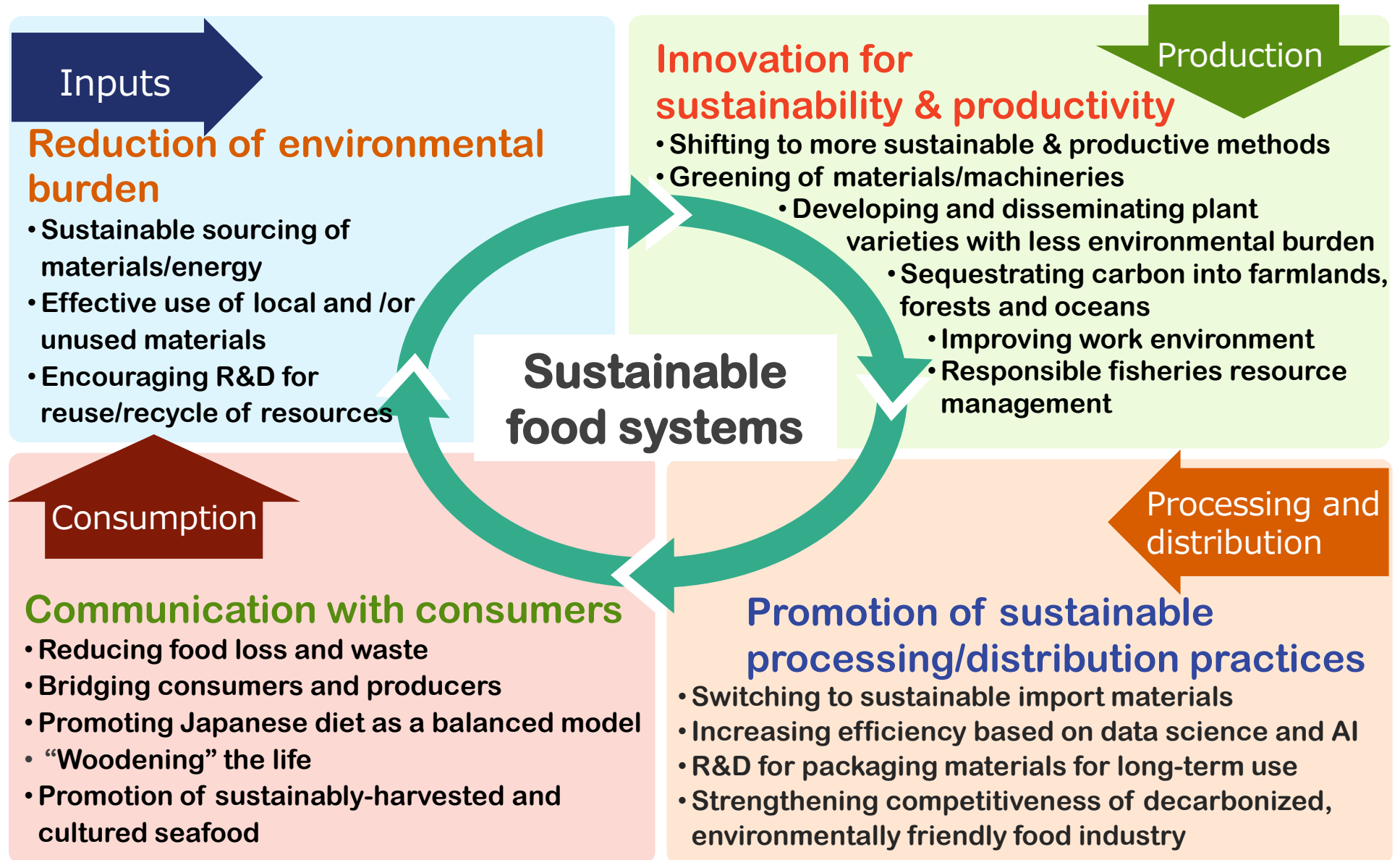


GHG Emissions from Agriculture, Forestry and Fisheries in Japan (FY2022)

Agriculture, Forestry and Fisheries (AFF) accounts for **about only 4%** of the domestic total GHG emissions. 80 % of the domestic methane emissions is from the AFF sector. Total methane emissions (2022) have been **reduced by about 33%** from the 1990 level. Per capita emissions are relatively small.



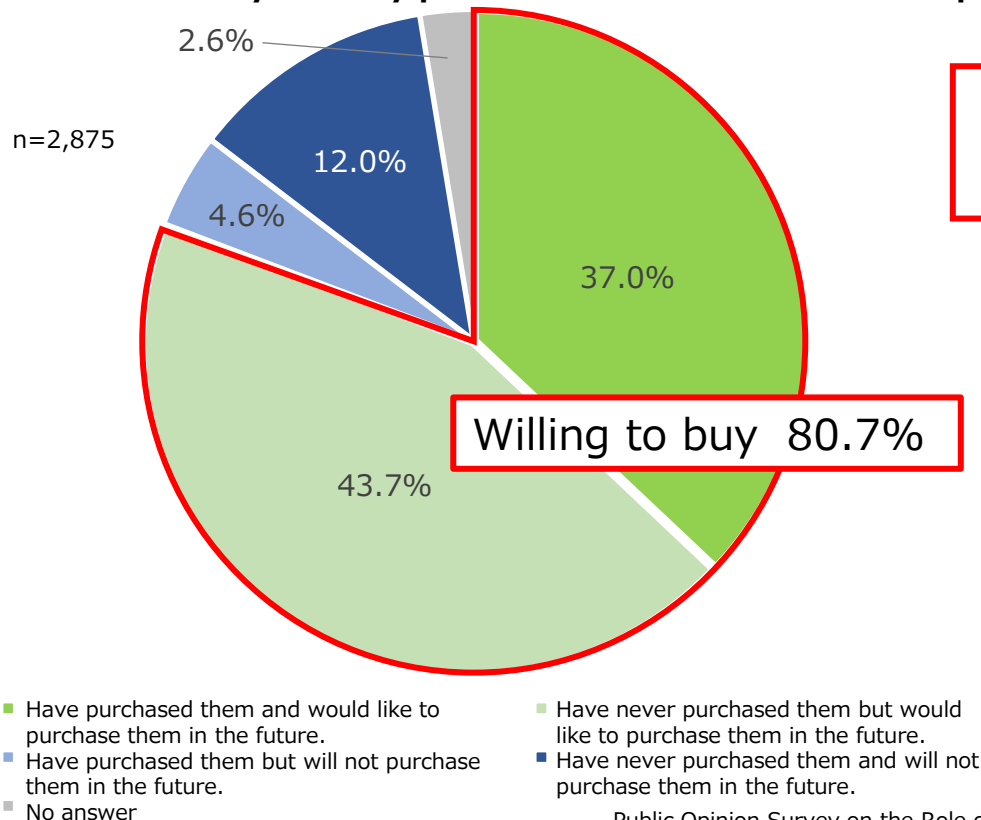
MIDORI's Approach



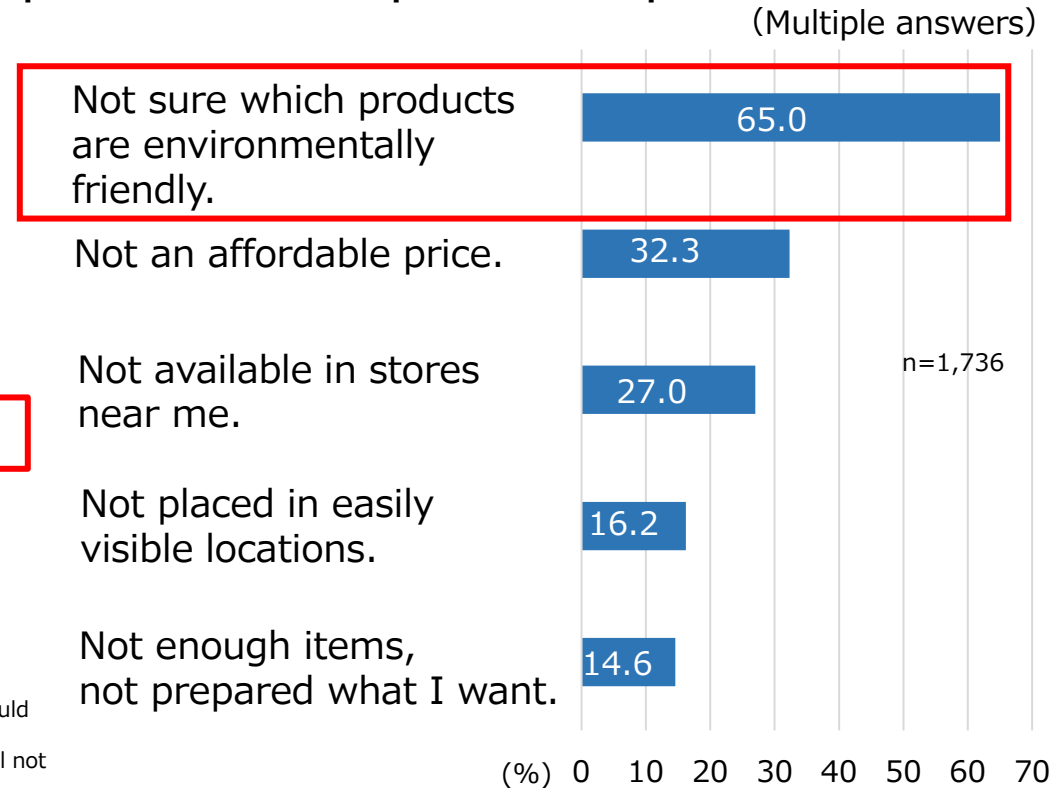
Consumer awareness of environmentally friendly agricultural products

- **More than 60% of the respondents answered that the reason why they have never purchased agricultural products grown using environmentally friendly production methods or will not purchase them in the future is because they are not sure which products are environmentally friendly.**
- **It is important to prepare the environment in which consumers can make choices through the “visualization” of farmers’ efforts to reduce environmental burden.**

Question: Have you actually purchased agricultural products grown using environmentally friendly production methods?



Question: Regarding the purchase of agricultural products grown using environmentally friendly production methods, why have you never purchased or will not purchase such products?



Visualization of environmental burden reduction efforts

- Based on the **MIDORI Act**, “visualization” of farmers’ actions to reduce environmental burden is promoted for consumers’ choices.
- Quantitatively calculated “avoided GHG emission rate” is graded as the number of stars and indicated in the labels of products.
- For rice, biodiversity conservation efforts can be evaluated according to the total score of farming practices as an additional indicator.

GHG emission reduction

$$100\% - \frac{\text{GHG emissions from individual farming practices}}{\text{GHG emissions from average farming practices in the region}} = \text{Avoided emission rate(\%)}$$

※For rice, vegetables, fruits, tea (23 crops)

- ★★★★: Avoided emission rate ≥20%
- ★★★: Avoided emission rate ≥10%
- ★: Avoided emission rate ≥5%



Biodiversity conservation

Farming practice (ex.)	Score (pts)
Chemical pesticides & fertilizers reduction	1~2
Winter flooding in paddy fields	1
Field margin vegetation management (herbicide-free)	1

※For rice only

- ★★★★: 3 points or more
- ★★★: 2 points
- ★★: 1 point

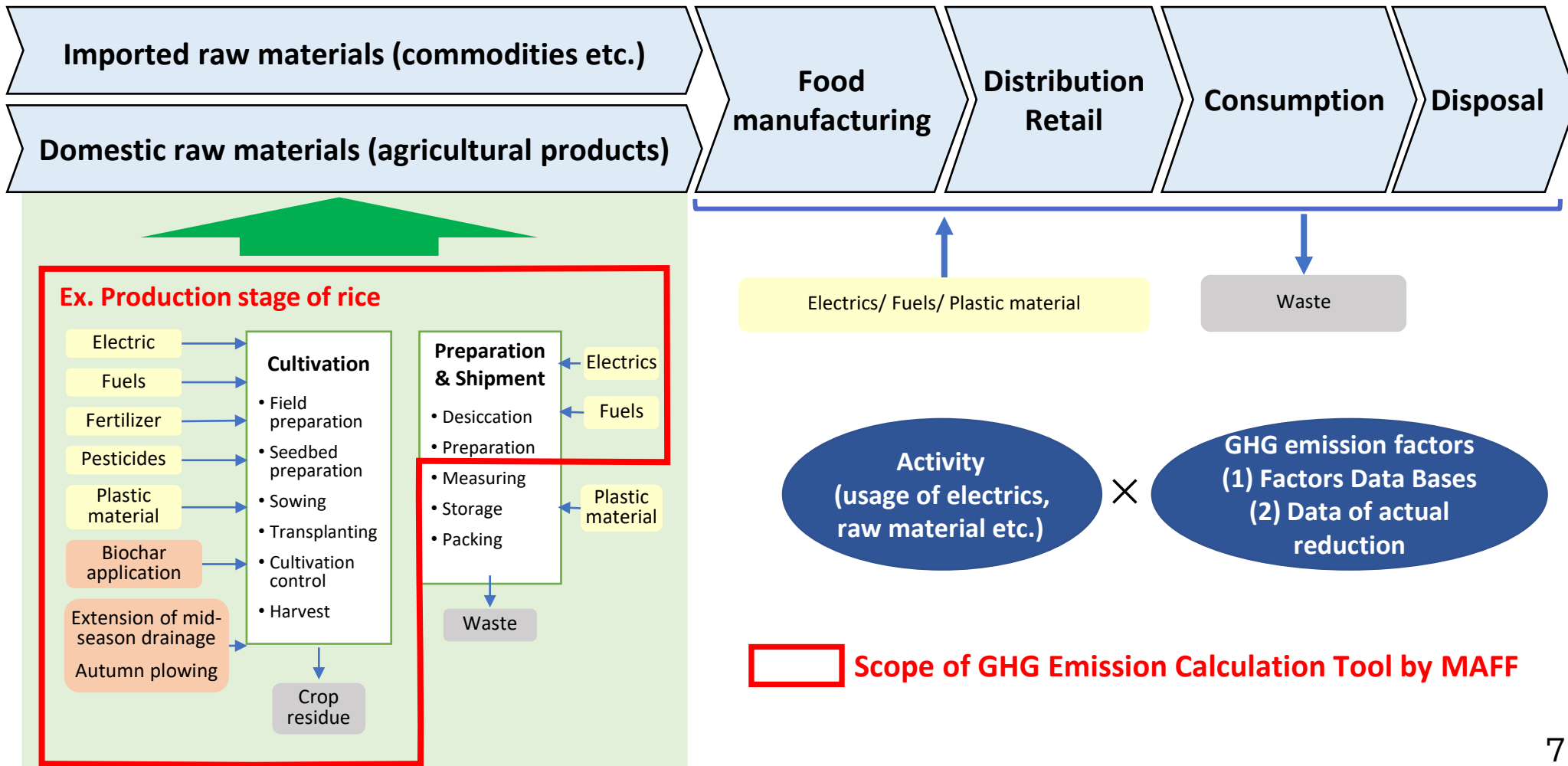


Three Key Characteristics of Visualization in Japan

1. Evaluate the **production stage**
2. Use **primary data** from farmers
3. Consider **regionality**

GHG Emissions Calculation Tool: Scope

- 80-90% of GHG emission throughout a full life cycle of food comes from a production stage.
- The crop **production stage** of domestic agricultural products is the scope of visualization in Japan.



GHG Emissions Calculation Tool: Input data and Crops

- Farmers provide **primary data** on their farming practices.
- The **differences of each region** are considered.
- The tool can calculate GHG emissions and reductions for 23 crop items, including rice, vegetables, fruits and tea.

Sample data

Basic information

Crops	Rice
Prefectures	Niigata
Cultivated area	10.0 a
Annual production	500 kg

How to treat crop residue

Crop residue	Residue plow
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How to irrigate paddy fields (applicable only for rice)

Water management	Intermittent irrigation
Extension of mid-season drainage	Yes

Practices to store carbon into soil

Biochar application	Yes
Biochar Types	Bamboo charcoal
Biochar Amount (5year total)	1,000.0 kg/10a

Use of cover crops

Cover crops Types	—
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Autumn plowing

Implementation	—
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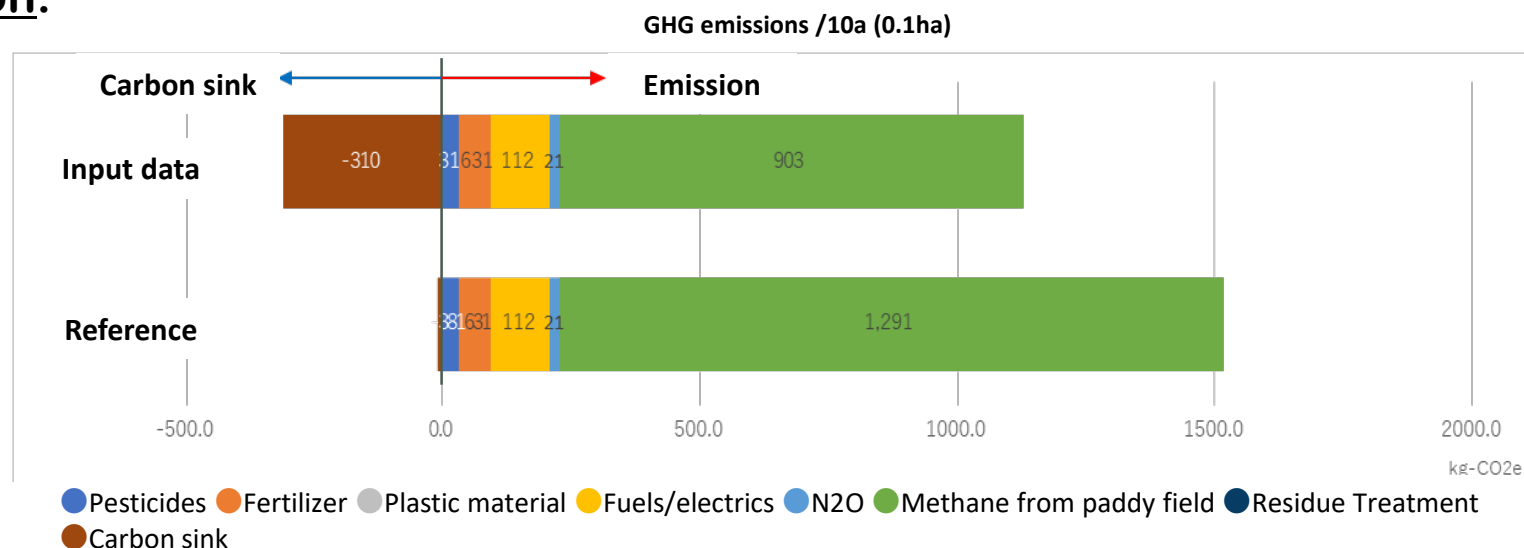
Input data

Pesticides usage	Data	Standard Value
Pesticides	Input data/ Use standard values	- kg/10a
Germicides		- kg/10a
Other agrochemicals		- kg/10a
Herbicides		- kg/10a
Fertilizer usage	Data	Standard Value
Nitrogenous fertilizer(N)	Input data/ Use standard values	- kg/10a
Phosphorus Fertilizers(P)		- kg/10a
Potash fertilizer(K)		- kg/10a
Manure		- kg/10a
Plastic material	Data	Standard Value
Agricultural PVC Films	Input data/ Use standard values	- kg/10a
Other plastic material		- kg/10a
Fuel & Electrics usage	Data	Standard Value
Gasoline	Input data/ Use standard values	- L/10a
Diesel oil		- L/10a
Kerosene		- L/10a
Heavy oil A		- L/10a
LPG		- L/10a
City gas		- m3/10a
Grid Electricity		- kWh/10a

※ applicable only for rice

Measuring: GHG Emissions Calculation Tool

- MAFF developed a Calculation Tool to quantify GHG emissions from crop production at the crop production stage based on farmers' primary data.
- The tool enables a comparison of GHG emissions from individual farmer's practices with the emissions from conventional/average farming practices in the region.



GHG emissions based on input data per 10a (0.1ha)			Reference (Regional Average)	
GHG emissions /10a	820.95 kg-CO ₂ e/10a	Ratio	1509.47 kg-CO ₂ e/10a	Ratio
Pesticides	30.6 kg-CO ₂ e/10a	2.7%	30.6 kg-CO ₂ e/10a	2.0%
Fertilizer	63.1 kg-CO ₂ e/10a	5.6%	63.1 kg-CO ₂ e/10a	4.2%
Plastic material	1.0 kg-CO ₂ e/10a	0.1%	1.0 kg-CO ₂ e/10a	0.1%
Fuels/electrics	111.5 kg-CO ₂ e/10a	9.9%	111.5 kg-CO ₂ e/10a	7.3%
N ₂ O	21.1 kg-CO ₂ e/10a	1.9%	21.1 kg-CO ₂ e/10a	1.4%
Methane	903.4 kg-CO ₂ e/10a	79.9%	1290.5 kg-CO ₂ e/10a	85.0%
Residue Treatment	0.0 kg-CO ₂ e/10a	0.0%	0.0 kg-CO ₂ e/10a	0.0%
Carbon sink	-309.8 kg-CO ₂ e/10a	-27.4%	-8.4 kg-CO ₂ e/10a	-0.6%

Result: Concept of “Avoided Emission Rate” and Labelling

- GHG Emissions Calculation Tool shows “avoided emission rate” based on the amount of GHG emission compared to that of average cultivation in the region.
- A grade for labelling is determined by comparing the rate with thresholds of each grade; stars are rewarded according to the avoided emission rate.

Avoided
emission
rate(%)

= 100% —

GHG emissions from the cultivation
by a farmer in question
—————
GHG emissions from average cultivation
in the region



GHG reduction

- ★ ★ ★ : Avoided emission rate ≥20%
- ★ ★ : Avoided emission rate ≥10%
- ★ : Avoided emission rate ≥5%

Concept of Biodiversity Conservation Labelling (for rice only)

- For rice, in paddy field, there are several practices for biodiversity conservation. These efforts would be evaluated basically by how many of these practices are implemented in the paddy fields.
- Labelling as an additional indicator of GHG reduction.



Total Score	0	1	2	3 or more
Grade	—	★	★★	★★★

(1) Chemical pesticides & fertilizers Reduction

Score
1~2



Source : PwC

(2) Winter flooding in paddy fields

Score
1



Source : Miyagi Prefecture

(3) Earthen-Ditch / Biotope

Score
1



Source : Niigata Prefecture

(4) Fish Conservation (fishway to paddy fields etc.)

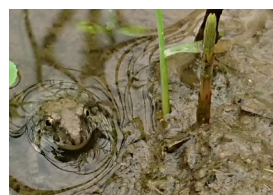
Score
1



Source : Shiga Prefecture

(5) Postpone/Stop mid-season drainage (until tadpoles become frogs etc.)

Score
1



Source : MAFF

(6) Field margin vegetation management (herbicide-free)

Score
1



Source : Kyoto Prefecture

Labelling on Products

- Communicate farmers' environmental burden reduction efforts to consumers with a label on the products
- Will expand the labelling to various stakeholders of food systems such as retails, food services, e-commerce and schools.

Retails

Spinach



Cabbage



Rice

農林水産省が実施している温室効果ガスの「見える化」で星3つ取得!

JAきたそらちの **ななつぼし**

- 化学農薬の使用を最小限に
- 環境に配慮した水管理の工夫

▶地球温暖化の原因の **温室効果ガスの削減**に貢献

※お米・おにぎり・お弁当共に、店舗によって取り扱い状況は異なります。

Food services

Onigiri (Rice ball)

温室効果ガス削減への貢献 星3つ取得しました!

おむすび 権米衛

福島県の「岩瀬グループ」さんのコシヒカリは、
 ・栽培期間中の化学農薬、化学肥料の削減
 ・効果的な水管理でメタン削減
 で温室効果ガスの削減に貢献しながら育てました。

Lettuce (Salad)

40th YEAR ありがとう

ワタミファーム 長野県東御農場
 農場長自慢の **有機レタス**

有機レタスのサラダ 399円 (税込438円)

土づくりにこだわる有機栽培! 鮮度を保つための温度管理!

6月13日 休

本日のお野菜で 心を込めて作りました。

熊本県八代市 成松 正直さん

広島県安芸高田市 株式会社すずき 鈴木 貴博さん

熊本県八代市 竹田 朗さん

Lettuce (Hamburger)

Next Steps

Improvement of GHG Emissions Calculation Tool

- Increase the number of items for which the tool can be used such as beef, dairy products and flowers
- Develop a web application that allows farmers to easily perform GHG emissions calculation
- Integrate newly developed practices/techniques for GHG emissions reduction into the calculation tool.

Enhancement of the labelling usage at retail and food service level

- Increase the distribution number of products with the labeling through domestic supermarket chains and local sales networks etc.
- Promote partnerships between food companies and restaurants.

Raising consumer awareness

- Encourage consumers to choose environmentally friendly agricultural products.
- Promote publicity and advertising through mass media.



Thank you !

