## Key Performance Indicators and Targets

| | | KPI | Targets for 2030 | | Targets for 2050 |
|---|---|---|---|---|---|
| Reduction of greenhouse gases | 1 | Zero $CO_2$ emission from fossil fuels combustion in the agriculture, forestry, and fisheries sectors | 14.84 million ton-$CO_2$ (10.6% reduction) | | 0 ton-$CO_2$ (100% reduction) |
| | 2 | Electrification and hydrogen battery use for agricultural and forestry machinery as well as fishing vessels | Increase the share of electric mowers and automated steering systems in practical use contributing to reduced use of fossil fuels: 50%<br>TRL related to electrification of high performance forestry machinery<br>TRL 6: Technology demonstrated under conditions relevant to the operational environment<br>TRL 7: Prototype demonstrated under actual operational conditions<br>Test operations carried out on small coastal fishing vessels | Development of technologies by 2040 | |
| | 3 | Introduction of fossil fuel-free horticultural facilities | Share of hybrid horticultural facilities installed per area: 50% | | Share of fossil fuel-free installations: 100 %. |
| | 4 | Introduction of renewable energy to Japan's farming and fishing villages | Introduction of renewable energy available to rural areas to achieve carbon neutrality in 2050 | | Introduction of renewable energy available to rural areas to achieve carbon neutrality in 2050 |
| Environmental conservation | 5 | Reduction in risk-weighted use of chemical pesticides | 10% reduction in risk-weighted | | 11,665 (risk-weighted) (50% reduction) |
| | 6 | Reduction in chemical fertilizer use | 720,000 tons (20% reduction) | | 630,000 tons (30% reduction) |
| | 7 | Increase in organic farming area | 63,000 hectares | | 1 million hectares (25%) |
| Food Industry | 8 | Halving of business-derived food losses compared to 2000 levels | 2.73 million tons (50% reduction) | | |
| | 9 | Improvement of labor productivity in food production through automation etc. | ¥6.694 million/person (30% improvement) | | |
| | 10 | Reduction of costs relative to sales in food and beverage wholesalers | Ratio of costs to sales in food and beverage wholesalers: 10% | | |
| | 11 | Sustainable sourcing for import materials | 100% | | |
| Forestry | 12 | Introduction of superior varieties and F1 plus trees<br>Development of wooden high-rise construction techniques and maximization of carbon sequestration in harvested wood products | Utilization the ratio of superior varieties and F1 plus trees : 30% | | 90% |
| Fisheries | 13 | Recovery of catch to the same level as 2010 (4.44 million tons) | 4.44 million tons | | |
| | 14 | Introduction of artificial seedling rate in aquaculture of Japanese eel, bluefin tuna, etc. | 13% | | 100% |
| | | Replacement of aquaculture feed with compound feed | 64% | | 100% |


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Published March 2023
Ministry of Agriculture, Forestry, and Fisheries website the Strategy “MIDORI"


The Ministry of Agriculture, Forestry, and Fisheries supports Sustainable Development Goals (SDGs).

MAFF
Ministry of Agriculture, Forestry and Fisheries

みどりの食料システム戦略

# Strategy for Sustainable Food Systems MIDORI

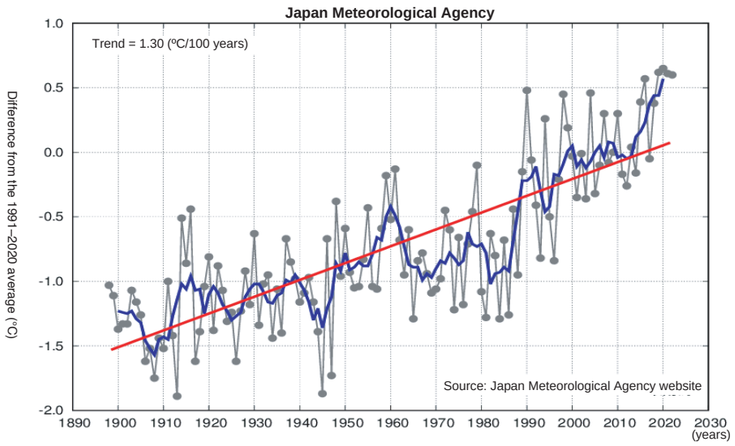
**Boosting the Productivity potential and Sustainability in the Agriculture, Forestry, Fisheries and Food industries with Innovation.**

MAFF
Ministry of Agriculture, Forestry and Fisheries

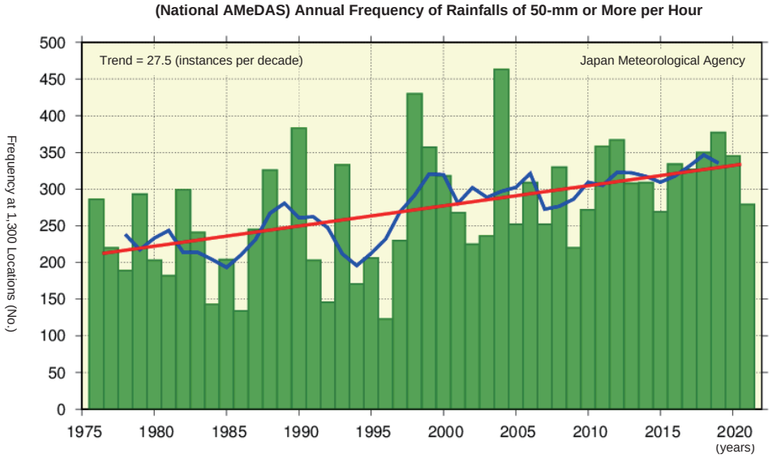
# Food Systems Challenge

Heavy precipitations, frequent typhoons, and rising average temperatures have become one of the gravest risks facing the food systems in Japan. They have major impacts on production sites such as reduction and quality degradation of harvests, and decline in fish catches.

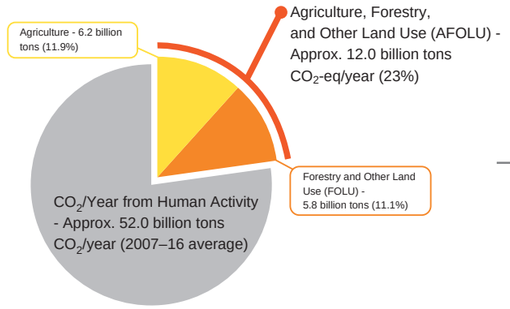
## ■Change in the average annual temperature deviation in Japan




## ■Annual Frequency of Rainfalls of 50-mm or More per Hour in Japan

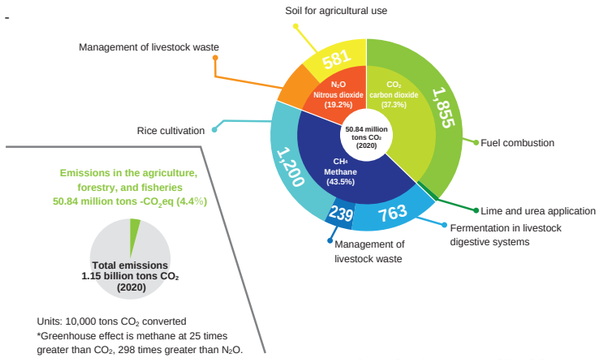



## ■Global Greenhouse Gas Emissions from AFOLU




Units: 0.1 billion tons $CO_2$ converted (2007-16 average)
Source: IPCC Special Report on Climate Change and Land (2019)

## ■Greenhouse Gas Emissions in the Agriculture, Forestry, and Fisheries in Japan

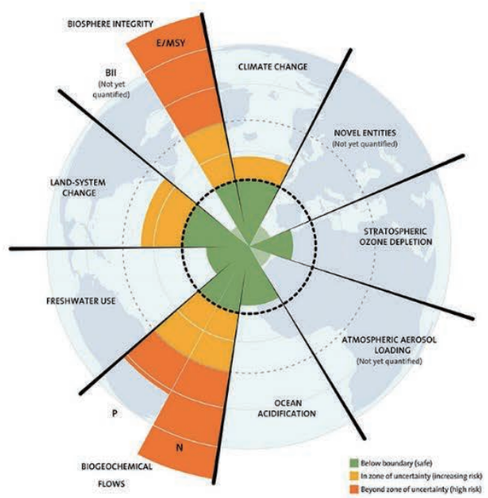



Units: 10,000 tons $CO_2$ converted
*Greenhouse effect is methane at 25 times greater than $CO_2$, 298 times greater than $N_2O$.

Source: Greenhouse Inventory Office (GIO), National Institute for Environmental Studies



# Toward the Sustainability Goals




Source: Stockholm Resilience Centre HP
(illustrated by Johan Rockström and Pavan Sukhdev, 2016),

## Planetary Boundaries

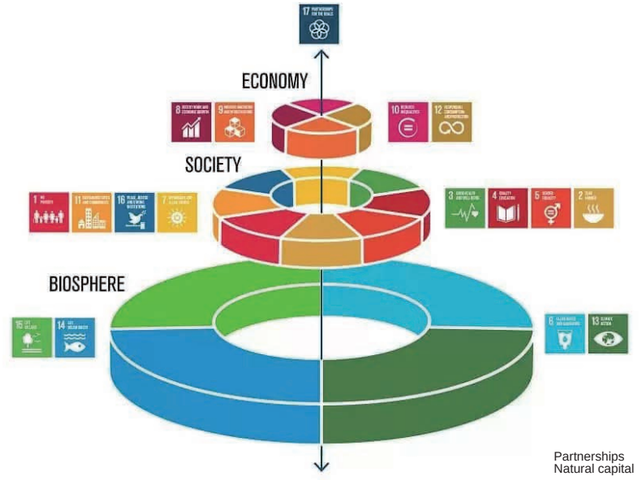
Johan Rockström and internationally renowned scientists proposed quantitative planetary boundaries within which humanity can continue to develop and thrive for generations to come. Crossing these boundaries increases the risk of generating large-scale abrupt or irreversible environmental changes.
Source: Stockholm resilience centre HP

The green zone in this picture is the safe operating space, the yellow represents the zone of uncertainty (increasing risk), and the red is a high-risk zone. Biogeochemical flows of nitrogen and phosphorus and biosphere integrity such as biodiversity are already in the high risk zone.

## SDGs Wedding Cake

SDGs wedding cake shown the economic, social and ecological aspects of the Sustainable Development Goals (SDGs).

It illustrates the sustainable biosphere is essential to achieving economic and social goals.
Source: Stockholm Resilience Centre
(illustrated by Johan Rockström and Pavan Sukhdev, 2016),




## Global Targets for Biodiversity

Biodiversity is being lost around the world at an unprecedented rates. The Kunming-Montreal Global Biodiversity Framework, a new global framework for biodiversity, was adopted in the UN Biodiversity Conference (COP15) in December 2022. This Framework includes 23 targets to be achieved by 2030, and calls for urgent action.

**Main Targets of the Kunming-Montreal Global Biodiversity Framework**

| Summary | |
|---|---|
| Conserved Areas | Ensure that at least 30 per cent of terrestrial and inland water areas, and of marine and coastal areas, are effectively conserved and managed through protected areas and other effective area-based conservation measures . (OECM) (30 by 30) |
| Wild species | Ensure that the use, harvesting, and trade of wild species is sustainable, safe, and legal, preventing overexploitation. |
| Pollution | Reduce pollution risks of from all sources, including by reducing excess nutrients lost to the environment by at least half, by reducing the overall risk from pesticides and highly hazardous chemicals by at least half. |
| Agriculture, forestry, and fisheries industries | Ensure that areas under agriculture, aquaculture, fisheries and forestry are managed sustainably, contributing to the resilience and long-term efficiency and productivity of these production systems, and to food security |
| Business | Take measures to enable business, and in particular to ensure that large and transnational companies and financial institutions regularly monitor, assess, and transparently disclose their risks, dependencies and impacts on biodiversity and promote actions to ensure sustainable patterns of production. |
| Reduction of waste | Ensure that people are enabled to make sustainable consumption choices reduce the global footprint of consumption, including through halving global food waste, significantly reducing overconsumption. |

# Strategy for Sustainable Food Systems MIDORI

## ~ Innovation will be the key to enhance both productivity potential and sustainability~

**"MIDORI," the medium-long term strategy will pave the way for the future.**

- Enhancing engagement of stakeholders at each stage of food supply chains
- Promoting innovation to reduce environmental burden

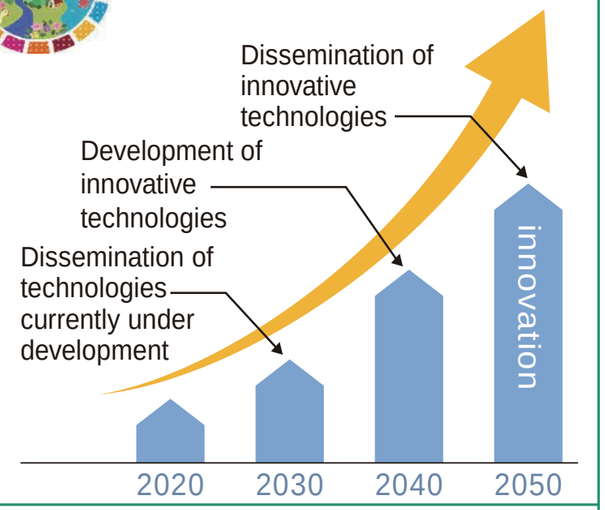
## Challenges

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

## Key Performance Indicators by 2050

- ➡ Zero $CO_2$ emission from fossil fuels combustion in the agriculture, forestry and fisheries sectors
- ➡ 50% reduction in risk-weighted use of chemical pesticides by dissemination of the Integrated Pest Management and newly-developed alternatives
- ➡ 30% reduction in chemical fertilizer use
- ➡ Increase in organic farming to 1Mha (equivalent to 25% of farmland)
- ➡ At least 30% enhancement in productivity of food manufacturers (by 2030)
- ➡ Sustainable sourcing for import materials (by2030)
- ➡ 90% and more superior varieties and F1 plus trees in forestry seedling
- ➡ 100% of artificial seedling rates in aquaculture of Japanese eel, Pacific bluefin tuna,etc.

**Zero-emission Sustainable Development**




**which will be enabled through:**

- development and dissemination of innovative technologies
- greening of MAFF's policy tools

## MAFF endeavors to accomplish the triple win of;

### Economic sustainability

Ensure robust and resilient food industry

### Social sustainability

Improve livelihood, promote balanced diet

### Environmental sustainability

Save global environment for the future generation

# MIDORI's Approach

**Transformation of the food systems require not only technologies but also awareness, efforts and behavioral changes by stakeholders.**
**The MIDORI Act, enacted in July 2022, defines the roles of various stakeholders and promotes their efforts to reduce environmental burden.**

## Inputs

### Reduction of environmental burden

- Sustainable sourcing of materials/ energy
- Effective use of local and/ or unused materials
- Encouraging R&D for reuse/ recycle of resources

## Production

### Innovation for sustainability & productivity

- Shifting to more sustainable & productive methods
- Greening of materials/machineries
- Developing and disseminating plant varieties with less environmental burden
- Sequestrating carbon into farmlands, forests and oceans
- Improving work environment
- Responsible fisheries resource management

**Sustainable food systems**

## Consumption

### Communication with consumers

- Reducing food loss and waste
- Bridging consumers and producers
- Promoting Japanese diet as a balanced model
- “Woodening” the life
- Promotion of sustainably-harvested and cultured seafood

## Processing and distribution

### Promotion of sustainable processing/ distribution practices

- Switching to sustainable import materials
- Increasing efficiency based on data science and AI
- R&D for packaging materials for long-term use
- Strengthening competitiveness of decarbonized, environmentally friendly food industry